How Central Banks Shape Liquidity Production: The Case of India

SUDEEP JAIN

A thesis submitted in partial fulfilment of the requirements of the University of the West of England, Bristol for the degree of Doctor of Philosophy

Faculty of Business and Law,

University of the West of England,
Bristol, May 2023

Abstract

This thesis develops a theoretical framework to study the role of central banks in shaping liquidity production in different financial structures and applies the framework to India. The theoretical framework draws on the three different ways in which scholars have interpreted the concept of liquidity—monetary liquidity (bank reserves held with the central bank), funding liquidity (ease of accessing cash) and market liquidity (ease of buying or selling a financial asset). The framework consists of two pillars. The first one represents how central banks create monetary liquidity, and is shaped by the monetary-fiscal nexus, capital account policy and exchange rate policy. The second pillar represents the link between funding liquidity of financial institutions and market liquidity of collateral in the money market. To examine how this relationship operates in different financial structures, the thesis develops the concept of position-making structures, which build on Minsky's concept of position-making. A position-making structure undergirds the money market, and is of one of two types, depending on whether the purpose of the money market is to meet cash demands primarily arising from bank deposits issued in the process of making loans (deposits-focussed position-making) or to enable the financing of securities by issuing repo liabilities (repo-focussed position-making). The ability to leverage collateral, which ties funding liquidity of financial institutions to market liquidity of collateral, is essential to repo-focussed position-making. The position-making structures, in turn, map on to the two financial structures, bank-based finance and market-based finance.

The empirical section chronicles the evolution of India's monetary liquidity framework and position-making structure following the economic reforms of the early 1990s, narrating how the RBI has resisted market-based finance while adopting a Neoliberal monetary liquidity framework. It shows how a system of shadow repo-focussed position-making developed in the early 1990s, culminating in a scam that prompted the Indian central bank to restrict leveraged trading of collateral and to double down on bank-based finance. At the same time, India was moving towards a monetary liquidity framework dominated by capital flows.

Following the Great Financial Crisis, the central bank continued to resist liberalizing repo markets, leading to the rise of non-bank-lending without market-based finance. The thesis concludes with policy implications for DECs and an agenda for further research.

Table of Contents

List of Tables

List of Figures

Introduction

'The practice of the Bank (of England) has, as we all know, been much and greatly improved… but though the practice has mended, theory has not'—Walter Bagehot, *Lombard Street: A Description of the Money Market (1873, p. 14)*

'The problem with QE (quantitative easing) is it works in practice, but does not work in theory' – Ben Bernanke, Former Chairman, U.S. Federal Reserve, 2014.

1.1 Central Banking Beyond Inflation Targeting

Gaps between theory and practice in central banking have existed since modern central banks have existed, as the above two quotes separated by 140 years show. During the high growth and low inflation years between 1985 and 2007, known as the Great Moderation, this gap was acknowledged by central bankers, but explained away with the aphorism that central banking was as much art as science (Mishkin 2007, Issing 2006, Tietmeyer, 2006). As monetary policy had come to be almost exclusively associated with price stability, academic research mostly concerned itself with determining the optimal level of the central bank's policy rate to achieve the targeted level of inflation and the transmission of the policy rate to long-term interest rates (Tucker 2004, p. 2-3, Nyborg 2017, Mehrling 2011, p. 109). Research on the practice of central banking--how central banks implemented monetary policy after they had decided the policy rate--was mostly restricted to technical work by central bankers on the efficacy of different monetary policy instruments (Borio 1997, Bindseil 2004, Couere 2018). According to Paul Tucker, a former Bank of England deputy governor, there was a "curious lack of interest" and "occasionally some puzzlement" about how central banks controlled access to reserve money through their monetary policy operations (Tucker 2004, p.3).

Then came the Great Financial Crisis (GFC) of 2007-08, accompanied by the Great Recession of 2007 to 2009. After the textbook response of lowering interest rates failed to end the recession, central banks in advanced economies (AEs) resorted to unconventional tools. Central banks dramatically increased the size of their balance sheets by introducing a variety of new measures, the most prominent being commitments to purchase pre-announced quantities of securities from the market, known as Quantitative Easing (QE). QE was a watershed event for central banking. It exposed central banks to criticism from both sides of the political spectrum—from the right for potentially sowing the seeds for future inflation, and from the left for widening inequality by fuelling asset bubbles. QE showed that central bankers were not simply technocrats operating in an esoteric field of public policy, but political actors (Jones and Matthijs 2019, p. 129). The return of interventionist central banks was reminiscent of the pre-1980s era when central banks saw their role as shaping the development of the financial system (Goodhart 2011, p. 153). The urge to demystify central banking in its new interventionist *avatar* animated scholars from fields as diverse as economics, finance, politics, international relations, social studies of finance and economic geography. Some commentators opined that central banks were a new force in capitalism. Philosopher Joseph Vogl saw central banks as constituting a "fourth power, overshadowing legislature, executive and judiciary" (Streeck 2018, p. 145). Bowman et al. (2013, p. 466) went so far as to declare the dawn of "central bank-led capitalism". In contrast to the exclusive focus on inflation targeting rules before the GFC, scholars began to view central banks as political actors whose monetary policy actions deserved scrutiny.

1.2 Central Banking and Financialisation in DECs

Financialisation refers to accumulation of profit through financial rather than productive channels (Krippner 2005), accompanied by the rising power of financial actors and financial motives (Epstein 2005). It is driven by the creation of new types of financial assets from which income streams are harvested, and is aided by the promotion of individual asset ownership through credit by retrenching welfare

states (Leyshon and Thrift 2007, Hillig 2019). Scholars of financialisation had long argued that central banks were not mere technocrats but political actors who had enabled the rise of financialisation. They assert that the practice of central banking is deeply political, with different configurations of monetary policy favouring different interest groups (Epstein 2001, Gabor 2011)

The political nature of central banking has long been apparent in the case of Developing and Emerging Countries (DECs). Prior to the 1980s, central banks in many DECs had the responsibility of coordinating with governments to finance developmentalist policies (Epstein 2013). Thereafter, DECs were pushed by the Washington Consensus institutions to abandon developmental central banking in favour of inflation targeting and inflation targeting-lite policies, as part of a broader project of economic and financial liberalisation that included privatisation of banking, the introduction of market-determined interest rates, and fiscal discipline pushed by the Washington Consensus institutions (Epstein and Yeldan 2009, Williamson 2001). The adoption of inflation targeting reoriented domestic monetary and exchange rate policies in DECs to suit the interests of foreign investors engaged in carry trading by prioritizing low inflation and stable or steadily appreciating exchange rates (Gabor 2015, Kaltenbrunner and Bonizzi 2020. Central banks in DECs were key actors in the broader project of 'subordinated financialisation' of their respective economies, acting as interlocutors between the Washington Consensus institutions and DEC governments. DEC central banks as such became cheerleaders of financialisation, shepherding the creation of new types of financial assets for domestic investors as well as for global financial institutions as evidenced by empirical work on how central banking policies in DECs promoted subordinated financialisation, including Gabor (2011) in the case of Romania; Powell (2013) in the case of Mexico; Kaltenbrunner and Painceira (2017) in the case of Brazil, and Rethel (2010) in the case of Malaysia (also see Bonizzi (2013) for a review of the literature on financialisation in DECs).

Inspired by the literature on financialisation of DECs and the post-GFC focus on monetary policy implementation, this thesis started as a project to examine the role of the Indian central bank in the financialisation of the Indian economy. I was

interested in changes to the practice of central banking following the market-oriented economic reforms of the early 1990s that are widely credited with transforming the Indian economy (Dutt 1997, Bhagwati 1993, Ahluwalia 2016). However, despite the reforms, the advent of financialisation in India had been limited, as Jayadev et al. (2018) point out. India's financial system was dominated by state-run banks following two rounds of bank nationalizations in the 1960s and 1980s, the central bank continued to manage the exchange rate and markers of 'financial repression' in the form of high cash reserve ratios, statutory liquidity ratios and priority-sector lending commitments for banks remained (Jayadev et Al. 2018, p. 369). I wanted to examine the role of the central bank in shaping India's somewhat unique financialisation trajectory by bringing the post-GFC focus on monetary policy implementation and the financialisation literature's emphasis on central banks as political actors to the empirical terrain of India.

1.3 The Central Bank's Role in Post-Reforms India

I started by studying the money market, the market for short-term funds used by financial institutions to manage their liquidity needs and where central banks carry out their monetary policy operations[1]. However, it soon became apparent that I could not restrict my analysis of monetary policy implementation to the mechanisms used by the Reserve Bank of India (RBI) to control the supply of central bank reserves. Conversations with former RBI officials revealed that a securities market scam in India in the early 1990s had played a pivotal role in shaping the central bank's approach towards regulating trading in debt markets. The Scam had involved diversion of funds from the banking system by brokers in government securities to inflate a stock market bubble. Following the Scam, the central bank had become wary of market practices that enabled leveraged trading

[1] While the term 'money market' appears to first have been used by Walter Bagehot to describe the London bill discounting market, some authors use it specifically to refer to the unsecured interbank market for central bank reserves. This thesis uses the term more broadly, referring to the wholesale market for all short-term debt (of less than one-year maturity) including the unsecured interbank market.

of debt securities—trading positions financed with short-term market borrowing. Even 20 years after the Scam, RBI officials continued to invoke its legacy to resist calls for liberalising trading rules for debt markets (Ghosh 2011). However, many of the market practices that the RBI had prohibited in the wake of the scam, such as short-selling of debt securities, are seen as crucial for the development of liquid markets (Howell 2016). Had the RBI opted for potentially less liquid but what it viewed as more stable debt markets? How were the concepts of liquidity, leverage, and financial stability connected? The post-GFC literature on the practice of central banking had begun to consider these questions but mostly in the context of Advanced Economies (AEs) with liquid debt markets.

The RBI's cautious approach to trading practices was curious because developing debt markets was a long-standing aim of Indian policymakers, as part of an ambition to have a financial system that depended less on loans from banks and more on debt markets for credit. This aim was in line with the more market-based finance, less bank-based finance policy prescription for Asian DECs from the Washington Consensus organisations particularly after the Asian currency crises of 1997-98, which were blamed on excessive foreign-currency bank loans and fixed exchange rates (IMF 1998, The World Bank 2006).

In India, from the mid-2000s onwards, a succession of official committees made recommendations to increase liquidity of debt markets as part of a push towards market-based finance. A bad loans crisis in the banking sector in India starting in the early 2010s had further increased enthusiasm for market-based finance in India. However, until very recently, banks accounted for a giant share of credit creation in the Indian economy (Gopinath 2011, Sahoo 2013). Bank-based financing in India rose as a proportion of total debt in GDP between 1992 and 2012, while non-bank debt financing fell (Shukla 2015). Could it be that at least some RBI policies had thwarted or were thwarting the development of market-based finance? What changes to the structure of the money market and the role of the central bank would be required to shift from bank-based finance to market-based finance? The question is important because market-based finance remains a key aspiration of several DECs, despite a growing body of literature pointing out its fragilities

(Gabor 2020, Dutta et Al. 2020, Pape 2020). However, the financialisation literature does not provide the analytical tools to answer these questions. It has been criticised for focussing on the effects of the rise of the financial sector on wider society while neglecting the processes of finance (Christophers 2015, Poovey 2015, Dutta et al. 2020). Its "blackboxes" finance, assuming that it is an instrument of domination for the rentier class (Dutta et al. 2020, p. 36). I was in search of a theoretical framework that would allow me to map out the links between the various elements of liquidity production, such as the money market, the debt capital market, commercial banks, the external sector and the central bank in market-based finance and non-market-based finance.

1.4 The Macro-Financial View

The post-GFC literature provided a starting point for a study of liquidity production. Early research on the GFC built on Bernanke's (2005) 'Global Savings Glut' hypothesis, framing the crisis as the result of excess savings arising from current account surpluses in the East flowing into bad assets in the West. The bad asset at the centre of the GFC was subprime housing loans in the U.S. which had been pooled together into bonds to diversify risk on the mistaken assumption that homeowners would not default on their loans *en masse* (Reinhart and Rogoff 2008, Crotty 2009). However, an asset-side focus could not answer the question of how the bursting of a bubble in one section of the U.S. housing market triggered a financial collapse on both sides of the North Atlantic Ocean (Dwyer and Tkac 2009). The defining moment of the GFC was the freeze in money markets following the collapse of U.S. investment bank Lehmann Brothers. This event sparked the realisation that debt markets did not behave as they would in a perfect world and liquidity could not be abstracted away (Nyborg 2017, Mehrling 2011, Gabor 2016). Liquidity could no longer be considered a "free good", as was the case prior to the GFC, and how financial institutions funded assets was a critical question (Mehrling 2012, Spears 2019). Recognition that liquidity risk in money markets remained "undertheorized" spurred research on the topic (Tarullo 2019, p.77).

During this period, the "MacroFinancial View", which focussed on the systemic implications of the nature of balance sheet linkages between financial institutions, gained popularity (Borio 2018, Adrian and Shin 2010, McCauley 2018). This approach, which was developed by policy economists at the Bank of International Settlements, focussed on gross payment flows between global financial institutions rather than net flows between trade surplus and deficit countries (Dutta et al. 2020). Drawing on the premise that one financial institution's liabilities were another institution's assets, it highlighted the interconnectedness of balance sheets as a conduit of contagion during the GFC. This framing recast the GFC as a problem of unstable funding (liabilities) structures in the money market rather than simply a bad assets problem.

A key insight that came soon after the crisis was that ease with which financial assets could be bought or sold without moving their price (market liquidity) hinged on dealers' ability to access funding (funding liquidity) and vice versa (Brunnermeier and Pederson 2009). During the GFC, impairments in funding liquidity and market liquidity mechanisms fed into each other. This was because securities serving as collateral in repo transactions were marked to market prices. A fall in price triggered calls for additional cash or collateral, increasing funding requirements of dealers at a time when the prices of collateral used to obtain funding were falling. This led to "liquidity spirals" where dealers unable to continue funding securities could not make markets in those securities, causing a further fall in prices of those securities (Brunnermeier and Pedersen 2009, Schrimpf et al. 2020). This insight sparked a wave of literature which examined the link between liquidity of collateral and the ability of dealers to take on leverage on balance sheets that were marked to market prices (Adrian and Shin 2010). Other significant contributions in this mainly empirical literature include Pozsar's (2008, 2014, 2015) formative work on the rise of shadow banks, the entities responsible for intermediating collateral in market-based finance; Acharya et al. (2013) on shadow bank runs; and Gourinchas and Jeanne (2012) on the importance of state backing for safe assets, which are financial assets that preserve their value in good times and bad, and serve as collateral in repo transactions.

However, a key limitation of the macrofinancial view is its "depoliticising lens" which sees market-based finance as inevitable, and, implicitly, desirable (Knafo 2020, p. 92). A substantial portion of this literature is devoted to studying how market-based finance can be made more resilient, and prevented from morphing into riskier shadow banking (Adrian 2017, Gabor 2018). The depoliticising lens reduces the scope of research to the technicalities of liquidity management to preserve and perpetuate market-based finance.

1.5 The Minskyian Literature on Market-based Finance

A second strand of work that emerged after the GFC is more conceptual in nature, drawing mainly on the work of Hyman Minsky (1957, 1987) and a longer tradition going back to Keynes that views money and debt as balance sheet relationships (Gabor 2018, Bonizzi and Kaltenbrunner 2020). Mehrling (2011) names this approach as the 'Money View', which he describes as being anchored in Minsky's idea of the 'survival constraint' facing every institution in that it must meet its payment commitments to remain a going concern (see also Pozsar (2014)). For non-financial institutions, these payments commitments could include payments to suppliers, employee salaries, interest and principal payments on loans, bonds, etc. For banks and financial institutions, payment commitments mainly consist of loan disbursals, deposit withdrawals, interest and principal payments on bonds issued, payments for financial assets purchased, etc. Since most institutions do not keep large piles of idle cash on hand because it is expensive and non-remunerative, being able to borrow for short periods and at short notice is essential. As was the case with Lehmann Brothers, a reliable indicator that a financial institution is failing is being shut out of the market for short-term, short-notice borrowing i.e. the money market.

> It is in the daily operation of the money market that the coherence of the credit system, that vast web of promises to pay, is tested and resolved as cash flows or cash commitments (Mehrling 2011, p. 3).

The smooth running of the money market which supports the payment infrastructure is, thus, essential to validate a particular financial structure, because the buck stops with the money market. Interruptions in cash inflows in the main line of business can be accommodated if the institution involved can access cash to meet its payment commitments.

The Minskyian literature is broader in scope than the Macrofinancial View literature as it engages with the question of financial structure by making analytical links between the money market and the capital market. It does so through an analytical focus on the financial assets that financial institutions use to borrow or lend against in the money market. It theorizes market-based finance as a type of financial structure in which these financial assets—or collateral—act as a bridge between money and capital markets. Mehrling (2011, 2012) charts the rise of market-based finance as a system where long-term capital assets are increasingly funded through money markets rather than through bank deposits, or "money market funding of capital market lending". The integration of the money market with the capital market is at the heart of market-based systems of credit. Gabor (2016) argues that market-based finance is underpinned by institutional mechanisms that ensure the safety and market liquidity of collateral. Repurchase agreements or repos—the money market instruments at the centre of market-based finance—cannot serve their function without a deep and liquid market for the underlying collateral that is implicitly or explicitly backed by state authorities. The author connects the deregulation of repo markets with the reorganization of sovereign debt markets starting from the 1980s according to the template of the U.S. Treasury bills market, which prioritised market liquidity over financial stability. Sissoko (2019) focusses on the role of banks in market-based finance, arguing that banks provide liquidity services and loss protection services to both depositors and to markets. Outside economics, Hardie et al. (2013) theorize market-based systems as featuring marked-to-market balance sheets of financial institutions, securitization of loans, asset sales to shadow banks and a reliance on market-based liabilities rather than bank deposits.

A key point of overlap between the Minskyian and macro-financial literature is the acknowledgement that the role of central banks in market-based finance is fundamentally different from their historic role, famously articulated by Walter Bagehot in the 19th century as 'lenders of last resort'. Instead, central banks must act as "market makers of last resort" (Buiter and Sibert 2007) or 'dealers of last resort' (Mehrling 2011). This enhanced role involves providing central bank reserves against a wider variety of collateral, including private sector debt, through outright purchases or lending. However, it also entails lending specific forms of collateral against other forms of collateral, such as the U.S. Fed's Term Securities Lending Facilities and the U.K.'s Special Liquidity Scheme, which allowed financial institutions to swap a range of privately-issued collateral for sovereign paper with their respective central bank (see Hordahl and King (2012, p. 49-51) for a comparison of the two facilities). In other words, the central bank bolsters *market liquidity* in key collateral markets, standing ready to provide reserves or specific kinds of collateral, as the need may be. The focus of central banking intervention during crises shifts from stabilizing banks with central-bank clearing accounts to backstopping asset prices in financial markets during crises.

Where the Minskyian literature and the macrofinancial literature differ is over the reasons they ascribe for why central bank support would be required in the first place. The Minskyian literature is much more explicit in its recognition of instability as a feature rather than a bug of the financial system. This is no surprise given that the idea that Hyman Minsky is most famous for is the *endogenous instability of financial structures*[2]. Periods of stability fuel optimism about the ability of economic units to service their debts. As asset prices rise, credit conditions ease in tandem. Consequently, capital assets are financed with increasingly fragile borrowing structures that after a point depend on debt being rolled over since debt levels far exceed cash inflows of

[2] Endogenous instability is not exclusive to market-based finance, it is a feature of all modern financial systems. Minsky's seminal book *Stabilizing An Unstable Economy* predated the heyday of what we now refer to as market-based finance.

the units involved, ultimately resulting in financial crises. However, Minsky argued that instability might be endogenous but was not inevitable, and could be contained by regulatory policy.

> The regime of regulation by the authorities, chartering restrictions, and central bank determination of the volume and effectiveness of bank reserves is intended to control the destabilizing forces inherent in banking and finance (Minsky 1986, p. 280).

It was the task of the central bank to use its regulatory powers to "lean against" fragile borrowing structures by taking regulatory measures to tamp down exuberance during the upswing of the credit cycle (Minsky 1986, p. 364).

1.6 Critical Macro-finance

A subset of the Minskyian literature is the budding field of Critical Macro-finance (CMF), which self-consciously seeks to "politicize the plumbing of finance" (Dutta et al., 2020, p.38). The CMF literature diverges from the Money View in historizing and politicizing the rise of market-based finance in the U.S. mould (Gabor (2020), Pape (2020), Bonizzi and Kaltenbrunner (2020)). As an analytical frame anchored in power relations it allows for drawing links between financial structure and macro-institutions of the state and conceptualises their co-evolution as the result of political struggles (Gabor 2020). The literature pays close attention to the organisation of sovereign bond markets, linking the evolution of money markets with changes to funding structures for government bonds (Gabor 2016). It highlights the role of the state in "de-risking" new asset classes and systemic liabilities for the private sector in market-based finance (Gabor (2020).

Within the CMF approach, Pape's (2020) conceptualizes liquidity regimes as the institutional arrangements linking the payments system and the money market with capital markets within systems of credit creation. Pape (2020, p. 71) defines a liquidity regime as a "historically contingent public-private hybrid array of social, institutional, and market arrangements" that lend coherence to a payments system,

allowing it to provide the elasticity required to allow the circulation of credit in a stable manner (Pape 2020, p. 71). A liquidity regime is not static in time or in place. It evolves either due to profit-seeking innovations by private financial actors or legal or institutional changes by policymakers and regulators (Minsky 1957, Pape 2020). The concept of a liquidity regime captures the breadth of the institutional apparatus of liquidity production, which spans the payment systems, the money market and mechanisms for long-term credit creation. It highlights the interplay between the "microdynamics" of individual balance sheets that expand or contract to increase profits or minimize losses, and the "macrodynamics of regulatory apparatuses and policy settings" that facilitate or constrain individual balance sheet activity (Pape 2020, p. 73).

1.7 A Framework to Study Liquidity Production in Different Financial Structures

The Minskyian literature is thus a suitable initial framework to examine how central banks shape liquidity production across different financial structures. Drawing on Minsky's financial instability hypothesis, it emphasizes the tendency of borrowing structures to become increasingly fragile and the role of central banks in stabilizing them. Updating Minsky's ideas for contemporary times, the literature focusses on the microstructure of the money market and the role of collateral as a bridge between the money market and the capital market in market-based finance. It theorizes market-based finance as a specific configuration of balance sheet relationships between money market participants undergirded by institutional mechanisms that ensure safety and market liquidity of collateral, with central banks playing the role of dealers of last resort. Within the Minskyian literature, the CMF literature emphasizes the links between financial structure and state institutions, paying close attention to the organization of government bond markets. The concept of liquidity regimes focusses on the link between payment mechanisms and broader systems of credit creation.

However, the CMF literature is at a nascent stage, and most of its conceptual insights are about market-based finance. At present, neither CMF nor the broader Minskyian literature has theorized non-market-based finance. The Minskyian/CMF literature needs extending to analyse financial systems which do not conform to the market-based ideal-type, financial systems where collateral is prohibited from acting as a bridge between the money market and the capital market. Some authors in the Minskyian literature, such as Mehrling (2012), refer to bank-based credit systems when theorizing market-based finance, but do not set out a framework to analyse liquidity production within such systems.

This thesis operationalizes Pape's (2020) concept of a liquidity regime. Drawing on the Minskyian tradition that views money and debt as balance sheet relationships, it starts by conceiving a liquidity regime as a set of rules governing the balance sheet relationships between the various financial actors involved in liquidity production and credit creation in different financial structures. While these actors interact with each other in several venues, including the sovereign debt market, the corporate debt market, the foreign currency market, the unsecured interbank market as well as through bilateral transactions, most of these transactions entail changes in the balance sheets of the actors involved (Bonizzi and Kaltenbrunner 2020). The actors involved in liquidity production include the central bank, the Treasury, commercial banks and non-bank financial institutions. In the case of DECs, this list includes foreign investors. Since DECs occupy a subordinate position in the international currency hierarchy, international debtors have more power and enjoy a higher status than local debtors in payment systems (Kaltenbrunner 2015, Bonizzi 2017, Ramos 2019). Mechanisms to mediate cross-border flows have implications for financial fragility and external vulnerability of DECs (Bonizzi and Kaltenbrunner 2020). In the case of DECs, a liquidity regime is, thus, shaped by the market practices of private actors as well as monetary policy, sovereign debt management, capital account policy and exchange rate policy as well as financial regulation.

Consequently, any account of a liquidity regime must:

1) Illustrate the balance sheet transformations involved in the production of liquidity in both types of financial structure and the role of the central bank in the process.

2) Have the analytical bandwidth to explain how the balance sheet configurations that characterize a liquidity regime *evolve* because of financial innovation or policy changes.

This thesis draws on Foucault et al.'s (2013) notion of the **three dimensions of liquidity** to develop a theoretical framework that satisfies both the above conditions. The three dimensions of liquidity–monetary liquidity, funding liquidity and market liquidity– represent all the different ways in which scholars have interpreted the concept of liquidity (Foucault et al. 2013, Neilson 2013). Of these, funding liquidity and market liquidity have received the most scholarly attention. The key proposition of the Macrofinancial View is that the ability of dealers to make markets in securities (provide market liquidity) hinges on their ability to fund those securities (access funding liquidity) and vice versa (Brunnermeier and Pedersen 2009).

While Brunnermeier and Pedersen (2009) conceptualized funding liquidity in the context of the dealer system, subsequent authors have interpreted the concept of funding liquidity more broadly. They have equated it with liquidity provisioning, which is one of the canonical functions of commercial banks (Bhattacharya and Thakor 1993). In this interpretation, funding liquidity refers to the ability of any institution to access funds to make payments when required, and is a service primarily provided by banks (Neilson 2019, Foucault et al. 2013). For instance, a bank deposit is a promise by a commercial bank to make payments on the depositor's behalf when called to do so[3]. Similarly, when a bank approves a loan, it makes a promise to make payments when the borrower chooses to draw down

[3] The concept of funding liquidity is analytically distinct from the concept of funding. For instance, a transfer of deposits from another bank or a deposit of hard currency is a source of funding for the recipient bank since it results in an increase in its cash position. However, it is not a source of funding liquidity since a bank cannot rely on receiving a new retail deposit *when it needs it*. Commercial banks provide funding liquidity to each other through unsecured interbank borrowing or collateralised borrowing.

the loan. Banks, on their part, settle accounts with each other on the balance sheet of the central bank, with bank balances at the central bank referred to as reserves. A bank facing funding liquidity constraints of its own can borrow reserves from another bank with excess reserves in the interbank market or obtain reserves by selling or pledging collateral. When the banking system, as a whole, faces a shortage of reserves, the central bank can provide funding liquidity to the banking system by creating new reserves through the temporary or outright purchase of assets from banks. However, Neilson (2019) and Foucault et Al. (2013) put funding liquidity provided by the central bank into a different category of 'monetary liquidity'. This is because reserves are the ultimate means of payments. Only central banks can create reserves and, in theory, they can do so in unlimited amounts to ease the funding liquidity constraints of any entity that holds a deposit account with it. Central banks enact monetary policy by manipulating monetary liquidity, adding reserves (providing monetary liquidity) to ease funding liquidity constraints of the banking system, and removing reserves (withdrawing monetary liquidity) to tighten liquidity conditions[4]. If the central bank uses assets traded in debt markets to inject or withdraw monetary liquidity, monetary policy implementation would also impact the market liquidity of those assets (Gabor and Ban 2015). In DECs, monetary liquidity is created when the central bank intervenes in the foreign exchange market to keep the local currency competitive or to de-risk foreign portfolio investment (Gabor 2012, Painceira 2021).

[4] Monetary liquidity refers to the creation and destruction of reserves and does not include the transfer of reserves from one bank to another, as is the case with interbank borrowing. Consequently, only the central bank can provide or withdraw monetary liquidity.

Figure 1 Three Dimensions of Liquidity Production

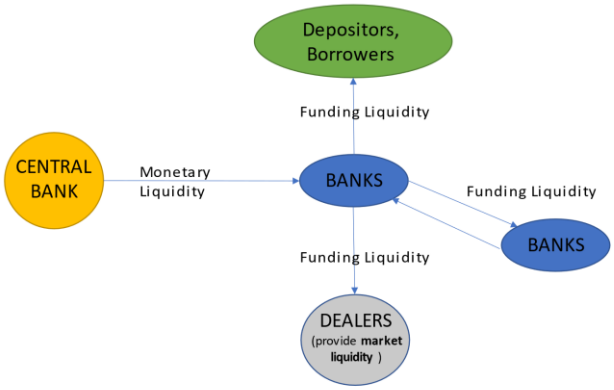


Figure 1 visually represents the three dimensions of liquidity production, describing the links between the three main entities[5] involved—the central bank, commercial banks and dealers--in terms of monetary liquidity, funding liquidity and market liquidity. The central bank provides monetary liquidity to banks. Banks, in turn, provide funding liquidity to depositors and borrowers as well as to dealers in the former of dealer loans, which could be collateralised or uncollateralised[6]. This enables dealers to provide market liquidity to securities, standing ready to buy and sell securities on demand. Monetary liquidity injections and withdrawals could also impact the market liquidity of some assets, depending on the instruments used by the central bank.

The three dimensions of liquidity is a useful starting point for a framework to study the role of central banks in liquidity production. It takes account of the special status of central banks in financial systems as providers of monetary liquidity. It, also, highlights the role of banks as providers of funding liquidity to borrowers and depositors, and the feedback relationship between funding liquidity and market liquidity in the dealer system. However, it is of limited use to examine how the

[5] Foreign exchange flows, which also affect liquidity conditions, are channelled through the balance sheets of domestic banks.
[6] In certain assets, such as government securities, banks act as market-makers themselves in some monetary systems, such as in the UK and Europe.

nexus between funding liquidity and market liquidity operates in different financial structures. For instance, the feedback relationship between funding liquidity and market liquidity is a feature of the dealer system and not a universal norm.

In market-based finance, market-based borrowings rather than bank deposits are the principal type of liabilities of the financial system (Hardie 2013). The dealer system is the heart of the money market and funding liquidity of the financial system as a whole depends on market liquidity of collateral. In normal times, banks supply funding liquidity to dealers who provide market liquidity to collateral (Mehrling 2012). However, during crises, it is not sufficient for the central bank to provide monetary liquidity to banks as part of its lender-of-last-resort role. Monetary liquidity by the central bank does not ease funding liquidity constraints for the system as a whole because banks are not prepared to extend funding liquidity to dealers amid collapsing collateral prices (Buiter and Sibert 2007, Mehrling 2012). The central bank must take up the dealer of last resort (DOLR), standing ready to buy, sell, lend and borrow securities to banks and non-banks as required to ensure market liquidity of collateral and relax funding liquidity constraints for the system. How the central bank carries out its function of DOLR is vital. If the central bank marks the collateral it accepts from financial institutions to market prices, falling prices diminish the ability of financial institutions to access funding liquidity, which further deteriorates the market liquidity of the collateral (Gabor and Ban 2016, Gabor 2020, Vestergaard and Gabor 2022).

In contrast, the dealer system is peripheral in bank-based finance, which is characterized by a lack of liquid debt markets. Bank deposits are the principal form of liabilities in the financial system. Consequently, funding liquidity of the financial system is not contingent on market liquidity of collateral. In crises, the canonical lender-of-last resort action as articulated by Bagehot (1873) is sufficient to restore funding liquidity for the system as monetary liquidity provided by the central bank to commercial banks translates to funding liquidity for the financial system (Mehrling 2012). This dynamic throws up several questions such as:

1) Given that funding liquidity is contingent on market liquidity in the market-based finance but not in bank-based finance, how are money markets wired differently in each financial structure?

2) What are the mechanisms to ensure financial institutions can access funding liquidity in the absence of liquid collateral?

3) What are the destabilizing tendencies and stabilizing features of each money market configuration and the corresponding financial structure?

These questions are of crucial importance to study countries which exhibit bank-based finance but with the long-stated aim of moving towards market-based finance, such as India. However, neither the three dimensions of liquidity nor the CMF literature on market-based finance provides the theoretical tools to answer these questions. To widen the scope of the liquidity dimensions schema and give it more analytical teeth, I develop the concept of **position-making structures** (PMS), drawing on Minsky's concept of position-making, which has largely been neglected by the Minskyian literature, with the notable exception of Neilson (2019). Position-making refers to the act of acquiring cash in the money market so that a financial institution can fulfil its payment commitments. The payment commitments differ in nature depending on the financial structure. In bank-based finance, bank deposits issued in the process of making bank loans are the main form of liabilities, while in market-based finance repos issued to finance securities are the main form of liabilities (Gabor 2016, Sissoko 2019). PMS refers to the respective money-market configurations that enable position-making in each financial structure. In bank-based finance, this is deposits-focussed PMS and repo-focussed PMS in market-based finance.

The next section introduces the theoretical framework developed in this thesis, ahead of a more detailed discussion in chapters 3, 4 and 5.

1.8 The Two Pillars of a Liquidity Regime

The three dimensions of liquidity schema shows how monetary liquidity, funding liquidity and market liquidity are linked. The central bank manipulates monetary liquidity to change funding liquidity conditions of banks. Depending on the instruments it uses, its monetary policy operations may also impact market liquidity of assets. However, this thesis places monetary liquidity and the funding liquidity-market liquidity nexus, which it examines through the conceptual tools of PMS, in two separate pillars of a liquidity regime. The first pillar of a liquidity regime is the monetary liquidity framework and the second pillar is PMS. This thesis argues that a central bank's influence on liquidity production extends beyond actions that entail a change to its balance sheet, which the monetary liquidity framework captures. This point is uncontroversial since some central banks also have supervisory powers, making them responsible for financial stability in addition to price stability (Borio 2015, Dikau and Volz 2021). This supervisory power takes the form of microprudential regulation, which is meant to ensure that individual institutions are following the central bank's rules on capital adequacy ratios, cash reserve ratios, liquidity ratios etc. After the GFC, supervisors have increasingly adopted macroprudential regulation, which refers to the use of countercyclical measures such as differential capital requirements and loan-to-value ratios for certain sectors of the economy, to prevent credit bubbles from forming in the financial system (Baker 2013)). However, this thesis argues that, beyond microprudential and macroprudential regulation, central banks can and do use their supervisory powers to shape the wiring of the money market through money-market rules on what financial institutions can or cannot do with collateral. The central bank, thus, shapes balance sheet rules for other financial institutions, which in turn influences the broader financial structure. A framework that only focusses on how the central bank uses its balance sheet for creation of monetary liquidity does not capture this aspect of central bank influence on liquidity production. As this thesis will show, the Indian central bank has used its regulatory powers in Minskyian fashion to restrict leveraged trading in the money market, which has impeded the rise of fragile market-based finance. At the same time, India's monetary liquidity framework ostensibly resembles countries which exhibit market-based finance, with the central bank taking up the role of buyer of last

resort of government securities, in effect backstopping market liquidity of government securities (Arslan et al. 2020, Gabor 2018, 2020, Mushtaq 2021). Consequently, India's financial structure cannot be inferred from the mechanisms that the central bank uses to infuse monetary liquidity. Inflation-targeting and capital account liberalisation, which are the key features of the neoliberal monetary liquidity framework adopted by the RBI, are compatible with both bank-based and market-based financial structures.

1.9 Why A New Theoretical Framework?

Preceding sections have highlighted the idiosyncratic nature of RBI policy-making, pointing out its stated aspiration of market-based finance, on the one hand, and its reticence towards key aspects of market-based finance, such as leveraged trading in debt markets, on the other. At the same time, the RBI has moved away from developmental central banking and adopted neoliberal policies advocated by the Washington Consensus institutions, such as inflation targeting and capital account liberalisation. The RBI appears to hew to the edicts of neoliberal policy-making when it comes to using its own balance sheet for monetary policy operations, but eschews the neoliberal approach when it frames rules on how the financial institutions it supervises can use their balance sheets, such as by discouraging leveraged trading. The problematique of this thesis is to study how the Indian central bank's seemingly contradictory approach has shaped mechanisms of liquidity production.

The thesis has identified the critical macrofinance approach as a starting point to study liquidity production. The CMF approach, which draws on the Minskyian premise of money as balance sheet relationships that are shaped by historical and political processes, focusses on market-based finance in the U.S. template. It examines the mechanisms to ensure that funding liquidity and market liquidity are intertwined and highlights the role of the central bank in stabilizing market-based

finance when the relationship between funding liquidity and market liquidity breaks down.

However, the existing literature, CMF or otherwise, does not give an account of liquidity production in financial systems that do not exhibit market-based finance. In these financial systems, funding liquidity and market liquidity are not locked in a feedback relationship and the central bank does not act as market maker of last resort. This thesis proposes to extend the CMF lens to include both market-based and non-market-based financial systems by putting flesh to Pape's (2020) concept of a liquidity regime, which refers to the institutional arrangement of the payments system, the money market and market for longer-term credit. The existing literature has not developed the concept of a liquidity regime. It has not considered questions such as what are the different components of a liquidity regime, how do they interact with each other, how do liquidity regimes differ in market-based finance and non-market-based finance, etc. Moreover, if one adopts the Minskyian ontological position that money is a set of balance sheet relationships, any account of a liquidity regime must set out the balance sheet transformations involved in the production of liquidity, as the Minskyian and CMF literature do in the case of market-based finance.

This thesis aims to fill the gap in the literature by developing a framework based on Minskyian ontological premises and which applies to liquidity creation in both market-based and non-market-based finance. It recognizes that the power of central banks in some DECs such as India extends far beyond the traditional function of monetary policy authority, and includes capital account management, exchange rate regulation and financial regulation. Accordingly, it conceptualizes a liquidity regime as comprising two pillars—one which corresponds to the ways in which a central bank uses its own balance sheet to generate monetary liquidity, and the other corresponding to the nature of the funding liquidity-market liquidity nexus, which reflects the ways in which other financial institutions use their balance sheets in the production of liquidity. The two aspects of liquidity production embodied by the two pillars—how central banks use their balance sheets and how other financial institutions use their balance sheets in the

production of liquidity—can evolve independently. One cannot necessarily infer the nature of the funding liquidity-market nexus, from the policies the central bank uses to inject monetary liquidity. The concept of a liquidity regime comprising two pillars, thus, aims to capture the intricacies of liquidity production and sources of financial fragility in the idiosyncratic financial systems of DECs. In this, it contributes to two bodies of literatures on DECs—Pillar 1 contributes to the critical literature on macroeconomic management in DECs (see Chapter 4), while Pillar 2 contributes to work on the wiring of the money market in DECs from a political economy perspective such as Gabor (2018) in the case of China and Viktorov and Abramov (2018) in the case of Russia.

1.10 Structure of the Thesis

This thesis is divided into three parts: methodology, the conceptual section and the empirical section.

Chapter 2, the methodology chapter, justifies the use of grounded theory to address the problematique of this thesis, which is to study the institutional apparatus of liquidity production in the two different financial structures. It describes the data collection methods employed, and explains the need for key-informant interviews. Lastly, it shows how this thesis used grounded theory to develop Pillar 2 of a liquidity regime.

The conceptual section consists of three chapters. **Chapter 3** elaborates the Minsky's concept of position-making before developing the concept of position-making structures to examine the funding liquidity-market liquidity nexus in different financial structures. It then sets out of the theoretical scaffolding of a liquidity regime, comprising the monetary liquidity pillar and the PMS pillar. **Chapter 4** illustrates the operation of the two types of monetary liquidity frameworks, Developmental and Neoliberal, using balance sheets. It shows how in the Developmental framework, government spending determines the creation of monetary liquidity. In the Neoliberal framework, which features inflation targeting and capital account liberalisation, capital flows determine creation of monetary liquidity.

Chapter 5 elaborate the operation of the deposits-focussed and repo-focussed PMS and how they fit in their respective financial structures, bank-based finance and market-based finance. The key difference between the two is leveraged trading of collateral is restricted in the former and facilitated in the latter, tying funding liquidity and market liquidity in a feedback relationship. The chapter also compares the two financial structures in terms of systemic risks and role of the central bank.
The empirical section consists of four chapters and is narrated from the vantage point of crises. There is a long history of what Garbade (2016) calls "precipitative" events leading to substantial changes in market rules and regulations. This thesis contends that the precipitative events that have shaped India's liquidity regime are the balance of payments (BoP) crisis of 1991, a securities market scam in 1992 and the Great Financial Crisis (GFC).
Chapters 6 and 7 are the empirical counterparts to chapters 4 and 5, which theorize the monetary liquidity framework and position-making structures, respectively. **Chapter 6** narrates India's shift from a Developmental to a Neoliberal monetary liquidity framework following the BoP crisis. India ended deficit monetisation, adopted a managed exchange rate and embarked upon gradual capital account liberalisation, with a preference for equity over debt flows. The RBI was mindful of the destabilizing effects of capital flows but believed it to be the lesser, and manageable, evil compared to deficit monetisation. C**hapter 7** chronicles the rise of a system of repo-focussed PMS in the shadows of India's poorly regulated deposits-focussed PMS, which culminated in the Securities Scam of 1992. The Scam instilled a fear of leveraged trading of collateral in the RBI and prompted it to double down on deposits-focussed PMS and bank-based finance. The RBI took steps such as banning short-selling of government securities and reuse of collateral to prevent the development of a repo-focussed PMS and market-based finance.
Chapters 8 and 9 cover the evolution of India's monetary liquidity framework and position-making structure following the GFC. **Chapter 8** show how capital account liberalisation of debt flows accelerated following a change of leadership of the RBI. This resulted in a sharp rise in inflows amid Quantitative Easing, further undermining the RBI's control over monetary conditions in the economy. The RBI also formally adopted inflation targeting and moved from collateralised lending to

open market operations to inject monetary liquidity, forcing it play the part of buyer of last resort for government securities during periods of capital outflows. **Chapter 9** chronicles the effect of a crisis in non-bank lending companies, which had seen sharp growth in the 2010s amid conditions of abundant monetary liquidity and a bad loans crisis in the banking sector. The RBI response to the crisis showed it was unwilling to support credit creation outside the banking sector despite its stated aim of promoting market-based finance. The chapter highlights the RBI's refusal to acknowledge the role of leveraged trading of collateral and credit and liquidity backstops from the banking system in market-based finance.

Chapter 2 Methodology

The introductory chapter located this thesis in the critical macro-finance (CMF) approach. CMF, which is a subset of the Minskyian literature, politicizes and historicizes liquidity practices in market-based finance, focussing on the entanglements between global financial actors and macro-institutions in market-based finance. Drawing on Pape (2020), a liquidity regime was conceptualized as a set of balance sheet relationships between the various entities involved in liquidity production. This thesis seeks to extend the CMF approach beyond market-based finance by building a theoretical framework to study how central banks shape liquidity regimes in both market-based and non-market-based finance. The theoretical framework will be applied to empirical terrain of India to examine the evolution of its liquidity regime following the economic reforms of the early 1990s.

This chapter elaborates the methodology used to address the problematique of this thesis. It is organized as follows: the first section justifies the use of grounded theory as the chosen methodological approach, including a discussion of the benefits and limitations of using grounded theory in economics. The second section is a discussion on data sources used, focussing on the need for key informant interviews as a source of primary data. The third section explains how this thesis applied the methodology of grounded theory to address1 the research questions.

2.1 Using Grounded Theory in Economics

This thesis is unambiguous in its aim to develop new theory rather than apply an existing theoretical framework to the empirical context of India. Since the 1960s, the staple tool for theory-building in economics is completely specified mathematical models.

> If an economic theorist today writes a model, she must clearly specify all the parameters and details, just like a mathematician who proposes a theorem or a problem waiting to be proved or solved. (Gao 2021, p. 8)

Theory-building in economics follows a "definition-proposition-proof" format, which starts with defining the variables, proposing a model using those variables in line with logical axioms, and proving the proposition by solving the model (*Ibid*). Empiricists, on the other hand, aim to either verify theoretical models using econometrics and quantify the relationship between the variables in the model or to estimate empirical models without using a theoretical framework (Ouliaris 2011). Modelling in economics sits on a spectrum ranging from what Morgan (1995) calls "mathematical models without data" to empirical models estimated without any underlying theory. Both empirical and theoretical models follow a hypothetico-deductive methodology where a hypothesis is initially proposed and then tested using either mathematical logic or econometrics.

Till the 1960s, the formalist style of theory-building in economics consisted of a combination of verbal propositions and mathematical equations (Gao 2021). However, in the present day, mainstream economics has little tolerance for theory-building that does not involve completely specified models. The dominance of "complete model" formalism in economics has contributed to the marginalization of schools of thought such as Old Institutionalism, which are dismissed as being "descriptive" and "anti-theoretical" (Hodgson 1998, p. 166). The "methodological imperialism" of models and econometrics in economics is also behind the wholesale dismissal of qualitative methods in economics as being "soft" and "not rigorous" or "not economics" (Basole and Ramnarain 2012, p. 138).

However, the research questions of this thesis are not amenable to mathematical modelling or to econometric analysis as they focus on the institutional structure of a liquidity regime, which manifests as balance sheet relationships between financial institutions. Reducing the institutional structure of the financial system to variables and representing the relationships between financial institutions through

mathematical equations, even if it were possible, is not useful in answering the research questions of this thesis.

The research questions of this thesis fall into the domain of what John Neville Keynes (1891) called "applied economics", which seeks to connect the lessons of positive economics (the way the economy works) to the aims of normative economics (the way it should work). David Colander (1992), a prominent critic of the obsession with deductive and formalistic models in economics, refers to applied economics as "the art of economics", which requires fundamentally different methods compared to positive or normative economics.

> In the art of economics, because of the interconnection of sociological and political dimensions of the problem, precise tests are impossible. Judgment dependent on institutional and historical information is required... Often simple statistics, tables, charts, and case studies are the appropriate modes of expression for empirical work in the art of economics...The appropriate methodology for such applications involves sociological and political observations and, to stay within the confines of precision established by the law of significant digits, is generally not precise. (Colander 1992, p. 195)

The question is whether there is a systematic framework of enquiry for questions in applied economics requiring qualitative techniques or quantitative analysis not involving mathematical modelling or econometrics? Finch (2002) and Lee (2016) advocate for the use of "grounded theory" in economics, which refers to theory that is "grounded" in empirical data (Robson 2002, p. 191). Pioneered by sociologists Barney Glaser and Anselm Strauss in the 1960s, the methodology of grounded theory spoke to calls for "mid-range theories" in sociology which were neither so abstract as to be irrelevant for analyzing real-world phenomena, nor so concrete that they lacked broader explanatory power (Pigeon and Heywood 2004, p. 625).

A key feature of grounded theory that distinguishes it from other forms of qualitative research is its insistence that data collection and data analysis proceed simultaneously (Urquhart et Al. 2009). The methodology emphasizes theory building rather than verification of existing theoretical propositions. However,

"theoretical sensitivity"—familiarity with existing theories as well as empirical work on the topic—is essential (Glaser 1978, Urquhart et al. 2009).

The main tool for the creation of grounded theory is categorization (Finch 2002, p. 215). According to the pioneers of grounded theory, categories are the "conceptual elements of theory" (Glaser and Straus 1967, p. 30). The categories do not merely describe the data but are analytical concepts in their own right, and, thus, at a higher level of abstraction than the data. According to Dey (2007, p. 170) categories form the skeletal structure or "the theoretical bones" of the analysis. The categories should not replicate the researcher's prior understanding of the phenomena being investigated and should also be generalizable (Finch 2002, p. 218). Generalisability is crucial to avoid creating too many categories which reduces the analytical power of the grounded theory, reducing it to mere description.

Most published accounts of grounded theory research procedures caution against using pre-existing concepts and ideas from the literature in the analysis as the focus is on generating new theory. Indeed, grounded theory arose in opposition to the dominant position of the 1960s that sociological research should have a "firm *a priori* theoretical orientation" (Robson 2002, p. 191, Dey 2007). However, proponents of using grounded theory in economics point out that theory building in the discipline would require the researcher to rely on some "non-grounded" concepts or "received" theories (Finch 2002, p. 220). According to Lee (2016), economists using grounded theory must acknowledge that all observations and data are "conceptually theory-laden" and that an economist is not a neutral observer going through "facts".

> By acknowledging the issue of conceptually laden observations while at the same time demanding that the economist be sceptical of all pre-existing theory, the grounded theory method is a highly self-conscious, engaging, and open-minded approach to economic research, data creation and collection, and theory building and evaluation. (Lee 2016, p. 41)

Joseph Schumpeter, Hyman Minky's PhD advisor, referred to the non-grounded concepts that serve as raw material for theory-building as "vision", which is necessarily ideological in nature.

> Anlaytic effort starts when we have conceived our vision of the set of phenomena that caught our interest, no matter whether this set lies in virgin soil or inland that has been cultivated before. The first task is to verbalize this vision or conceptualize it in such a way that its elements take their places with names attached to them that facilitate their recognition or manipulation in a more or less orderly schema or picture (Schumpeter 1954[1994], p. 42).

According to Minsky (Minsky 1992, p. 369), Schumpeter encouraged researchers to develop their vision "that in a sense is prescientific of what the game is about, about the way the beast functions, about the way the various of economics and social sciences are related and, yes, about our own maps of Utopia". The reference to Utopia implies that the vision is necessarily ideological in nature.

> Analytic work begins with material provided by our vision of things, and this vision is ideological almost by definition. It embodies the picture of things as we see them and wherever there is any possible motive to see them in a given rather than another light, the way in which we see things can hardly be distinguished from the way in which we wish to see them (Schumpeter 1954[1994], p. 42).

David Colander also stresses that 'vision' is pre-scientific and undergirded by normative positions that economists should acknowledge (Holt and Rosser Jr. 2018). In other words, the use of grounded theory in economics entails recourse to non-grounded concepts that serve as the starting points of theoretical enquiry. Researchers must, however, acknowledge that these concepts, or vision, are ideological in nature.

Lee (2016, p.40) lays out a schema for economists to follow. The condensed form of the schema is as follows:

Step 1: Familiarization with pre-existing concepts, ideas, arguments and evidence

Step 2: Data collection with constant comparisons

Step 3: Identification of initial theoretical categories

Step 4: Theoretical sampling to refine categories until saturation achieved

Step 5: Proposition of substantive theory

Theoretical sampling, unlike statistical sampling, refers to collecting data to refine theory and not for empirical verification. The researcher adapts her data collection methods as she develops here theory (Glaser and Straus 1967, p. 32). Consequently, the researcher is necessarily selective in their use of data, actively seeking data that supports or refutes their proposed theoretical categories for the purpose of refining the categories. Theoretical sampling is critical as it represents the "flip-flop" between data and conceptualization that distinguishes the grounded theory approach from hypothetico-deductive methods (Pidgeon and Heywood 2004, p. 630). The researcher stops theoretical sampling when "theoretical saturation" is achieved—when additional data collection does not "yield surprises" that negate the emerging theory (Finch 2002, p. 220).

However, one of the limitations of grounded theory is the absence of guidelines on when saturation can be said to have been achieved. This decision is left to the judgement of the researcher. Although David Colander does not refer to grounded theory, his "Yeah" criterion in applied economics is a handy guideline for grounded theory researchers on whether theoretical saturation has been achieved. The "Yeah" criterion is "a satisfactory explanation [that] involves an inner sense—an intuition—that tells me, Yeah, that's right; that's the way it works" (Colander 1998, p. 39). Lee (2016, p. 43) points out that even if theoretical sampling is ended prematurely, the resulting theory is not "empirically false" as it is still grounded in empirical data. However, it may not be "adequately dense" and may be "incompletely realistic".

The next section discusses the data collection methods used for developing the grounded theory to answer the research questions of this thesis, highlighting the need for key informant interviews.

2.2 Data Collection

The pioneers of grounded theory, Barney Glaser and Anselm Strauss, divided data sources into two broad categories—documents and data collected through fieldwork (Glaser and Strauss 1967). However, the authors did not privilege one

form of data over another, or prescribe a precise format for data collection (Flick 2018). Since ground theory is characterized by theoretical sampling rather than representative sampling, data collection may include reading documents, conducting interviews or participant observation, often at the same time (Glaser and Strauss 1967, p. 75). Although interviews are the most common form of data collection in qualitative research, including in grounded theory, it is not imperative to conduct interviews to develop grounded theory.

The need for interviews in this project arose due to the inadequacy of documentary sources of data. The documentary sources of data were broadly of two types—documents published by the RBI and the government such as the RBI's official history, Annual reports, RBI Committee Reports, published speeches of RBI officials, periodic publications of the RBI such as the Financial Stability Reports (see Bibliography for a full list) as well as statistical data released by the RBI. Taken together, the RBI's published documents, particularly the official history and speeches, form a comprehensive and compelling narrative of the evolution of banking and finance in India (subsequent chapters will refer to different aspects of the RBI's narrative in greater detail). However, documents published by the RBI were inadequate for the purpose of this thesis for two reasons i) Bowen (2009) cautions that researchers should look at documents with a critical eye by trying to ascertain whether they are balanced, the purpose of the documents and the target audience. My perusal of the documents indicated that they represented the RBI's version of events, and unreservedly cast the RBI in a favourable light. b) They represented a historical account rather than an analytical account of the development of various aspects of India's financial structure. This is not to say the RBI's narrative is atheoretical—any historical account of economic events implicitly or explicitly depends on a theoretical framework (Antipa and Bignon 2018). Rather the theoretical assumptions in the RBI's narrative are obscured by presenting them as common-sense axioms. The purpose of this thesis is to develop a grounded-theoretical narrative of the evolution of India's liquidity regime and the role of the central bank in shaping the process. Consequently, access to unpublished resources was crucial to obtain empirical data that may have been left

out of the RBI's narrative, either because it was considered unimportant or because the RBI did not want to draw attention to it.

One possible source of unpublished documentary data was memos and minutes of the RBI's internal meetings as well as meetings between the government and the RBI, which are catalogued in the RBI's Archives in Pune, India. I spent two weeks at the RBI Archives in Pune in November 2017 to explore the possibility of using archival data. However, the RBI has an extremely restrictive policy for providing archival access to external researchers. I was told by the RBI authorities that access to documents less than thirty years old is not permitted, and access to documents concerning monetary policy or gold policy, irrespective of their age, is also not permitted as these topics are considered "sensitive". Due to these restrictions, the RBI archives had to be ruled out as source of data. Consequently, I chose to conduct key-informant interviews with former RBI officials as a source of supplementary data. Key informants are people in key roles or who are extremely knowledgeable of the topics under consideration (Bewley 2002). Key informant interviews aim to elicit information about the motives and constraints involved in making a particular decision by asking decision makers or those with direct knowledge of the situation (Ibid).

One of the challenges of key informant or elite interviews is gaining access to respondents, which requires "strategies that include a mixture of ingenuity, social skills, contacts, careful negotiation, and circumstance" (Odendahl and Shaw 2002, p. 305). From my experience as a financial journalist in India, I was aware that central banks are notoriously secretive institutions and central bankers are wary of talking to outsiders given the sensitive nature of their job. To circumvent this problem, I made the decision to interview retired RBI officials instead of serving RBI officials on the assumption that the former would be more accessible and forthcoming in the interviews. I targeted officials who had worked in one of the following departments that are relevant to the subject of this thesis—Internal Debt Management, Monetary Policy, Financial Markets, External Investments and Operations, Banking Supervision, Foreign Exchange and Financial Stability. The RBI officials interviewed consisted of former chief general managers (who each

head a single RBI department), executive directors (who each oversee a few chief general managers) and deputy governors (who each oversee a few executive directors). Deputy governors are the senior-most officials after the governor, who heads the central bank. My sampling strategy prioritized gaining access to former deputy governors as they have substantial decision-making power and tend to have more hands-on knowledge of the departments they oversee compared to the governor. In addition, many deputy governors are career central bankers, in contrast to governors, and tend to have deep knowledge of the RBI as an institution. My attempts to gain access to former RBI governors were unsuccessful.

The interviews were semi-structured in nature, in line with grounded theory methodology which emphasizes flexibility and openness to "surprises" during data collection (Flick 2018). To initiate the sampling process, I used my journalist network to make contact with two former RBI officials and followed a 'snowballing' technique, where one interviewee refers other potential interviewees to the researcher. Snowballing is a popular technique for key informant and elite interviews, and has been used in macroeconomics and political economy research by Kaltenbrunner (2011, 2018), Kaltenbrunner and Painceira (2017) and Naqvi (2016), among others. I interviewed seven former RBI officials, one former external advisor to the RBI, and eleven current and former executives of banks, primary dealerships, central counterparties and rating agencies. While the priority was interviewing RBI officials, I also interviewed non-RBI sources to gain a more wholistic picture of the Indian money market, to gain an external perspective on RBI policy and to make the best possible use of my time in the field in India. All the interview subjects, RBI and non-RBI, were extremely knowledgeable about Indian debt and money markets and could offer nuanced insights on the subject. Sixteen of the 19 interviews were conducted in person in Mumbai, while three interviews were conducted over the telephone as the subjects were not based in Mumbai. For in-person interviews, participants were provided with an information sheet providing details about the research topic and requested to sign a consent form which promised full confidentiality by anonymising both names and former designations. For telephonic interviews, and in the case of one in-person interview

where the participant was visually impaired, verbal consent was obtained. In the text of this thesis, RBI interviewees are cited as 'RBI official No. XX' and all types of non-RBI interviews as 'Bank official No. XX'. In one case where the interview participant held two key roles at different points in their career, the subject is represented as two separate persons to protect their identity. All interviews were transcribed, with no mention of the identity of the interview subjects in the transcription document. The document matching codes to the identities of the interview subjects for my reference was kept in a separate location under lock and key. The interviews were conducted in two rounds between January and April 2019 and September and October 2019, in line with grounded theory methodology where researchers often alternate between data collection and data analysis. While the first round of interviews helped lay the foundations of my theoretical framework, the second round of interviews helped refine the framework. The interviews were critical for development of my theoretical framework, particularly Pillar 2, which focusses on position-making structures. They were also useful for the empirical section of the thesis.

The next section describes how grounded theory was developed to answer the research questions of this thesis.

2.3 How I Used Grounded Theory

This thesis used the methodology of grounded theory, as articulated by Lee's (2016) schema in the following manner.

Step 1: Familiarization with pre-existing concepts, ideas, arguments and evidence

This step involved familiarization with the academic literature on monetary policy implementation. In addition, , I went through publications of the Indian central bank, identifying the RBI's narrative as the dominant narrative of monetary developments in India. The extent to which academic understanding of monetary developments mirrored the RBI's narrative was striking.

Step 2: Data collection with constant comparisons

I first approached the RBI Archives for primary data collection. However, since this attempt was not fruitful, I decided that I needed to conduct key-informant interviews with former RBI officials and other participants in India's money market. Interviews afforded me the opportunity to scrutinize the RBI's narrative by posing nuanced questions to key participants in the evolution of India's monetary policy.

Initial interviews with RBI officials highlighted the effect of a scam in the early 1990s in shaping the RBI's restrictive attitude towards leverage in debt markets and market-based finance. Recognizing the importance of the Scam was key to developing Pillar 2 of the theoretical framework of this thesis. At this stage, I also came across Minsky's work on position-making, which was adopted as the 'vision' of the thesis. I began to explore the possibility of building on the concept of position-making to create a new theoretical framework for financial structure that would accommodate both market-based and non-market-based finance.

Step 3: Identification of initial theoretical categories

In an interview, a key informant mentioned that their first safeguard that a borrower would not default in a money market transaction was his assessment of the soundness of the counterparty, not collateral, even if the transaction was collateralized. He implied that the RBI was keen that the money market remain a site for collateralised borrowing and not for financing collateral. This exchange sparked the idea that 'counterparty-based' and 'collateral-based' could be the basis for a typology of position-making that mapped on to bank-based finance and market-based finance, respectively.

Step 4: Theoretical sampling to refine categories

This involved a second round of interviews in India as well as further examination of RBI publications. The initial categories, which focussed on the more abstract principle of collateral and counterparty, were dropped in favour of a categorization based on the nature of liabilities in different financial structures deposits—deposits and repos.

Step 5: Proposition of substantive theory

The concept of position-making structures was developed as one of the pillars of a liquidity regime. The differences between the two types of position-making structures were illustrated using the tool of balance sheet visualisation. Balance sheet visualisation is tool popular among Minskyian researchers, as it draws on the premise that money and debt is a set of balance sheet relationships (Mehrling 2011, Gabor 2017, Gabor and Vestergaad 2018, Sissoko 2019). Although this approach has not been elaborated by any of the authors, it uses balance sheets as a theoretical device to represent financial systems in an abstract manner. It rests on the premise that financial institutions efforts to make sure that cash flows meet cash commitments manifests in their balance sheets, which is the cornerstone of the double-entry book-keeping system. However, it is not enough to view balance sheets, which are usually prepared to correspond to the end of a reporting period, as static devices. Since there is no one-to-one correspondence between item on the assets' and the liabilities' side of a unit's balance sheets, a balance sheet, by itself, cannot say much about how assets are *funded*. As it is almost impossible to observe how balance sheets change in real time, one must have a conception of how balance sheets change. The balance sheet approach, thus, uses stylized depictions of changes in balance sheets as a theoretical device to examine the workings of finance. It allows for comparison of different approaches within the Minkysian literature based on their conceptualization of how balance sheets change.

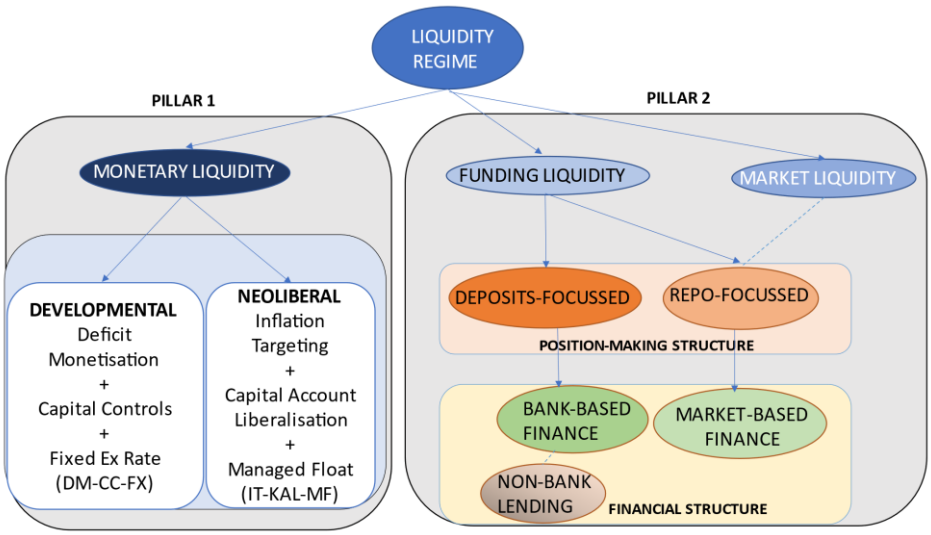
2.4 Conclusion

This chapter has elaborated the methodology used to answer the research questions of this thesis. It began by highlighting theory-building in economics, particularly mainstream economics, is almost exclusively restricted to mathematically modelling. However, critics of the dominance of mathematical models in economics have pointed out that many research questions in economics cannot be reduced to mathematical equations. This chapter situated the research questions of this thesis in the field of 'applied economics', requiring a more inductive methodology which pays attention to historical and institutional detail. This chapter argued that grounded theory, or theory grounded in empirical data, was an appropriate methodology of this thesis. However, as proponents of using grounded theory in economics have pointed out, using grounded theory in economics requires the use of non-grounded economic concepts as raw material for theory-building. The chapter then elaborated on the data sources of this thesis, focussing on limitations of RBI published documents as a data source and the need for key informant interviews due to the inability to access unpublished RBI documents from archival sources. The last section of the chapter explained how this thesis used grounded theory methodology for theory creation.

Chapter 3 The Two Pillars of A Liquidity Regime

In the introductory chapter, I proposed a theoretical framework for a liquidity regime comprising two pillars that draws on the three dimensions of liquidity. The three dimensions of liquidity are monetary liquidity (creation of reserves by the central bank), funding liquidity (the ease of accessing cash, and market liquidity (ease of selling a financial asset). The first pillar of a liquidity regime is the monetary liquidity framework, which captures the balance sheet activities of a central bank. The second pillar captures how central banks influence the funding liquidity-market liquidity nexus by shaping the rules on what money market participants can or cannot do with collateral. The introductory chapter also proposed to develop the concept of position-making structures to examine how the funding liquidity-market liquidity nexus operates in different financial systems.

Figure 2 Two Pillars of a Liquidity Regime



This chapter sets out the theoretical framework in more detail, ahead of a discussion of how each pillar operates in chapters 4 and 5. It starts with Pillar 2, first elaborating Minsky's concept of position-making before developing the concept of position-making structures as an analytical lens. A position-making

structure represents the wiring of the money market[7], and is of one of two types, depending on whether the purpose of the money market is to meet cash demands primarily arising from bank deposits issued by making loans (deposits-focussed position-making) or to enable the financing of securities by issuing repo liabilities (repo-focussed position-making). The position-making structures, in turn, map on to the two financial structures, bank-based finance and market-based finance. The chapter then set outs Pillar 1 of a liquidity regime, which is the monetary liquidity framework. It introduces Developmental and Neoliberal as the two types of monetary liquidity frameworks, and explains the central bank policies that they each embody.

3.1 What is Position-Making?

Hyman Minsky's concept of position-making flows from his view of the function of debt in a capitalist economy. As Minsky (1986[2008], p. 80) pointed out, a fundamental feature of capitalist economies is most income-generating capital assets are acquired with borrowed money, either in the form of loans, bond issuances or shares. As every debt instrument is a commitment to pay at some point in the future, acquiring assets by taking on debt sets up a series of future payment commitments. Examples of such commitments include interest and principal payments on loans and bonds and dividend payments on shares. Cash is required to fulfil these commitments. If income cash flows or existing cash holdings are not sufficient to fulfil the cash commitments, the economic entity must take recourse to new borrowing, or to selling or pledging assets.

Position-making is "the act of *acquiring cash* to finance the *assets essential* to a unit's business" so that those assets do not have be sold in distress to meet payment commitments (Minsky 1986[2008], p. 80). What counts as 'cash' or media of settlement and what are 'essential assets' differs depending on the type of entity. Cash for a particular entity means liabilities issued by an entity located one level higher in the hierarchy of money (Mehrling 2012). For instance, 'cash' for

[7] This thesis takes money markets to be the market for short-term, short-notice funding which includes the unsecured interbank market as well as collateralised markets.

commercial banks means reserves issued by the central bank, which are the settlement medium for banks. Transactions between banks are carried out by crediting or debiting their accounts with the central bank. 'Cash' for non-bank firms and households, who do not have accounts with the central bank, means bank deposits for the most part. Similarly, an 'essential asset' for a firm would be a physical asset like a factory of machinery, while for a bank, an essential asset would be a loan or lines of credit that it offers firms. Table 1 lists essential assets and cash for different types of entities.

Table 1 Essential Assets and 'Cash'

Type of Entity	Essential Asset	'Cash' (Medium of Settlement)
Firm	Capital assets (factories, machinery, etc.)	Demand Deposits
Bank	Loans, Lines of Credit	Reserves
Market-makers, such as primary dealers	Securities for market-making	Demand deposits or reserves if PDs have accounts with central bank

Consequently, position-making acts as a constraint on asset acquisition as rapid asset acquisition might result in the unit struggling to make position in its assets. How easy or difficult it is for units to acquire cash to make position reflects liquidity conditions in the economy. If it is too difficult to make position, units will struggle to maintain control over essential assets. If it is too easy to make position, it could lead to credit bubbles.

Position-making ability, thus, refers to the capacity of a unit to "force a cash flow in its favour" without having to liquidate income-generating assets in distress (Minsky 1986[2008], p. 81]. Corporations primarily depend on financial institutions to make position through instruments such as overdrafts and lines of credit while retail borrowers and depositors depend on bank deposits for position-making.

Financial institutions depend on the money market to make position. If a financial institution cannot finance its own assets, such as loans, many of which are the liabilities of corporations, it will not be able to offer position-making facilities to corporations. The ease with which financial institutions can make position in the money market affects credit conditions for the entire economy.

The question arises why financial institutions must make position in assets since many of them, particularly banks, can acquire some assets by issuing their own liabilities, such as when a bank makes a loan to a customer and creates a matching deposit. This is a key proposition of the endogenous money framework, long argued by Post-Keynesian scholars (see Chick and Dow (2013) for a critical summary of Post-Keynesian approaches to Endogenous Money). This view has gained wider acceptance in recent years, including from the Bank of England (McLeay et al. 2014). The unique feature of banks is not their ability to make loans, which any entity with the requisite holdings of the means of payment (cash) could do. In modern financial systems where bank deposits are accepted as a means of payment by non-banks, banks have the power to create deposits out of thin air. It is this power to create spending power in the form of new deposits at the stroke of a pen that makes banks special, and distinguishes banking from money-lending.

However, Minsky's position-making framework highlights the distinction between *acquisition* of assets and the *financing* of assets through their lifecycle, or as Mehrling (2011) puts it, the difference between paying for an asset and funding the asset. An asset that has been acquired by issuing new liabilities may still need to be financed if those new liabilities are not acceptable as means of payments to one of the parties in the transaction. For instance, when a bank makes a loan to a customer to buy a car, it creates a loan and a matching deposit in the customer's name. In this case, the bank has acquired a new asset (the car loan) by issuing its own liabilities (the deposit). If the seller of the car has a deposit account with the same bank as the car buyer, the bank simply credits her deposit account while debiting the car buyer's deposit account by the same amount. In this case, the bank would not need to make position in the loan asset *at that moment in time* as its own liabilities are acceptable to the seller as a means of payment. However, if the seller subsequently

decides to draw down her deposit or if she has an account with a different bank, the bank would have to make position in that asset by transferring the requisite quantity of reserves to the seller's bank. This is because both banks occupy the same rung on the hierarchy of money (Mehrling 2012). Unlike the car seller or buyer, the second bank would typically not accept a newly created deposit with the first bank as payment. It would insist on payment in higher-order money, or reserves. The upshot is that acquisition of new assets entails taking on new liabilities, and maintaining positions in those assets requires fulfilling position-making requirements arising from those liabilities.

Consequently, position-making acts as a constraint on loan-making as rapid deposit creation through loan-making might result in the bank struggling to make position (McLeay et al. 2104). How easy or difficult it is for banks to acquire cash to make position reflects liquidity conditions in the economy. If it is too difficult to make position, banks will reduce their pace of loan-making and vice-versa. Monetary policy operates by making it easier or more difficult for banks to make position in deposits by altering the demand and supply of reserves (Borio 1997, Ihrig et al. 2020). To be sure, no fixed "money multiplier" relationship exists between the amount of bank deposits and the quantity of reserves demanded by banks, as argued by Endogenous Money theorists. Money-supply targeting, which refers to a central bank targeting a specific rate of bank deposit growth by adjusting the quantity of reserves, is now widely acknowledged to be impossible as banks innovate to stretch the amount of new liabilities that a given quantity of reserves can support during a credit boom, and vice versa (Minsky (1986[2008]), p. 271)). Rather than target a quantity of reserves, inflation-targeting central banks seek to alter the rate at which banks borrow reserves from each other or borrow from the central bank. However, an increase in deposit creation increases position-making requirements and the demand for reserves, even if the increases are not of fixed proportions. Monetary policy, thus, seeks to influence the creation of new liabilities, such as deposits, which represent new spending power in the economy. Central banks enact monetary policy by adjusting the supply and demand for

monetary liquidity. However, Minsky, in his account of position-making, does not theorize monetary liquidity.

3.2 Position-Making Assets

Minsky termed the instruments used to make position as position-making instruments. Although Minsky did not distinguish between different forms of position-making instruments, his examples included both unsecured liabilities, such as Fed Funds borrowing, and assets, such as Treasury Bills. The two principal ways for an entity to make position in essential assets are either by borrowing cash without collateral or sales or pledges of other assets in exchange for cash. Examples of position-making using unsecured borrowing include interbank borrowing, such as in the Fed Funds market, certificates of deposits (also known as wholesale deposits) issued by banks, and unsecured loans from banks to dealers. Retail bank deposits cannot be used by banks for position-making--although they are unsecured in nature, they cannot be acquired at short-notice to raise cash. The ability to borrow cash without collateral is restricted to institutions with a high credit standing whose unsecured liabilities are acceptable to cash lenders. Financial institutions face restrictions on the amount of unsecured borrowing, either mandated by regulators or in the form of exposure limits of lenders to individual counterparties.

Elsewhere in his seminal book Stabilizing an Unstable Economy, Minsky refers to PMAs, which are tangible financial assets which can be easily sold or pledged in exchange for cash. Minsky's conceptualization of PMAs emphasized market liquidity. An asset is a good PMA if it has a "broad and active market" which is "resilient" to normal selling pressure (Minsky (1986[2008]; p. 81). However, an asset could serve as a PMA even in the absence of a broad and active market, particularly in non-market-based financial systems which lack liquid debt markets. For instance, a central bank may accept securities at face value instead of at market price for its collateralized lending operations, allowing financial institutions to obtain reserves against illiquid securities. Consequently, this thesis conceptualizes PMAs as tangible financial assets which can be used to access funding liquidity. If

an asset can be converted into cash easily, it can serve as a PMA, even if it cannot be sold easily on the secondary market.

The emphasis on funding liquidity rather than market liquidity distinguishes PMAs from Safe Assets. Safe Assets are money-like assets that function as stores of value, and are seen as the fulcrum of market-based finance (Gabor and Vestergaard 2016). Safe assets have become a key topic of research interest following the GFC, resulting in the emergence of a 'safe assets' literature (see Gourinchas and Jeanne (2012) and Gabor and Vestergaard (2018) for reviews of the early and the more recent safe assets literature, respectively). However, the safe assets literature has hitherto restricted its focus to market-based finance, specifically the institutional mechanisms to preserve market liquidity of safe assets used as collateral in repo transactions. These institutional mechanisms allow capital market assets to be funded in the money market, enabling collateral to act as a bridge between the money market and the capital market. The literature does not focus on non-market-based financial systems which maintain a strict separation between the money market and the capital markets by specifying rules for what financial institutions can or cannot do with collateral. The position-making lens on the other hand, has the analytically breath to span both market-based and non-market-based finance. Further, PMAs are more precisely defined than safe assets. The position-making lens clearly distinguishes between cash and PMAs, unlike the safe asset lens which includes central bank reserves and bank deposits as safe assets. The distinction between cash and PMAs allows for more precise conceptualizations of liquidity production in distinctive financial systems, as will be shown.

To be sure, the concept of position-making is analogous to Minsky's concept of survival constraint (see Introductory chapter) and to the concept of funding liquidity (availability of funds). However, I use the concept of position-making for the following reasons:

i) Like the survival constraint, it starts from first principles by tackling the question of why any entity requires liquidity (Neilson 2019).

ii) It is more precisely defined than the concept of funding liquidity. The reference to cash acknowledges that what counts as cash differs depending on the entity. The reference to financing 'essential' assets opens the space to explore the possibility of different types of position-making depending on the nature of the essential asset in a particular financial system (illiquid loans vs liquid securities). I use this analytical space to develop the concept of position-making structures and examine the funding liquidity-market liquidity nexus in different financial structures.

3.3 Position-Making Structures

Position-making structures are the money-market mechanisms that enable financial institutions to acquire cash to finance essential assets. In bank-based finance, the essential asset of financial institutions is loans, which are illiquid in nature, and held to maturity on banks' balance sheets. In market-based finance, banks do not hold all their loans on their books. Most loans are either sold to other financial institutions or securitized (Hardie et al. 2013). In addition, corporations rely on issuance of debt securities rather than bank loans for funding[8]. Consequently, the essential credit asset in market-based finance is securities. The question is does the difference in the nature of essential assets require different position-making structures? This thesis argues that it does, as loans and securities have different position-making needs.

If the essential asset is an illiquid loan, position-making needs arise from the deposit liabilities issued in the process of making loans. A bank can acquire a loan asset (make a loan) by issuing its own unsecured liabilities, which are deposits. The need to make position arises when a borrower draws down the deposit created when the loan or line of credit were approved by her bank. I refer to the position-making structure (PMS) that enables banks to meet cash needs arising from

[8] A move towards market-based finance does not diminish the role of deposits in credit creation. When a company issues a bond, it is often the case that the bonds are bought by an investment bank with the purchased funded by newly created deposits if the investment bank is a depository institution or with a loan from a depository institution. The bonds are subsequently sold to other investors.

deposits as a deposit-focussed PMS. A deposit-focussed PMS is characterised by distinction between position-making assets (PMAs) and essential assets, which are loans. The bank can make position by borrowing reserves from another bank in the unsecured interbank market, by selling position-making assets (PMAs) or by borrowing against PMAs.

In contrast, in market-based finance, the essential asset is securities. Dealers, who make markets in these securities, need inventories of cash and securities to buy and sell securities as required. However, a dealer typically does not have large amount of capital in the form of cash or securities that she owns outright (Stigum and Crescenzi 2007). To operate, dealers depend on leverage, which refers to acquisition of assets through borrowing. For dealers, this borrowing could be in the form of unsecured dealer loans from banks. However, typical dealers need to post collateral to raise the cash to acquire securities (Stigum and Crescenzi 2007). In most cases, the dealer *repos* the security (posts it as collateral) that she is acquiring to raise cash for the acquisition (Adrian and Shin 2010). The dealer, however, cannot borrow cash equalling the market price of the security as the cash lender deducts a margin to guard against the possibility of a fall in the price of the security. If the fall in the price of the security posted as collateral exceeds the margin, the dealer must post more cash or collateral as margin. The dealer must make margin payments from her own capital or by borrowing cash in a separate transaction. Consequently, position-making involves raising cash against collateral to acquire securities in repo transactions as well as meeting cash demands from repos, such as due to margin calls. I refer to this PMS as repo-focussed as the focus of position-making is to enable financing of securities through repos. In repo-focussed PMS, there is no distinction between PMAs and essential assets.

Leverage in repo-focussed PMS allows a dealer to trade securities worth many times her capital. It is also binds funding liquidity of dealers and market liquidity of securities in a feedback relationship. A favourable movement of prices of securities in a dealers' portfolio eases funding liquidity constraints for a dealer,

making it easier for her to make markets in those securities[9]. *The use of leverage is the key difference between repo-focussed and deposits-focussed PMS* (Adrian and Shin 2010). While banks are highly leveraged entities in that their assets are worth many multiples of their capital, the leverage in banking comes from loans, which are illiquid in nature and are not marked to market prices daily, unlike securities. Depositors are shielded from losses on the loan sides by mechanisms such as central bank lender-of-last resort and deposit insurance (Sissoko 2019). The funding liquidity of an individual bank depends on the willingness of other banks to lend it reserves in the unsecured interbank market and on its holdings of PMAs which can be swapped for cash with other financial institutions or with the central bank.

In deposits-focussed PMS, the relationship between funding liquidity of banks and market liquidity of PMAs is less clearcut than in the case of repo-focussed PMS. Banks do provide funding liquidity to the dealer system or make markets in PMAs themselves. However, because the dealer system is peripheral and mechanisms exists to allow banks to access funding liquidity from illiquid PMAs, banks are not dependent on market liquidity of PMAs for funding liquidity themselves. Consequently, the relationship between funding liquidity and market liquidity is unidirectional, rather than bi-directional, as in the case of a repo-focussed PMS. As will be shown in Chapter 7, regulators are more concerned about leveraged trading of PMAs that could cause sharp fluctuations in their price than about market illiquidity of PMAs. Consequently, regulators ban or place restrictions on the reuse of collateral, so that a security posted as collateral cannot be reused to raise cash. To make PMAs a less attractive asset class for leveraged entities, regulators may also ban or impose restrictions on short-selling to make it difficult for investors to bet on price falls of PMAs. All these regulations have the effect of keeping the dealer system peripheral. Regulators prefer banks rather than leveraged dealers make markets in PMAs. Consequently, to participate in deposits-focussed PMS, an

[9] This accounts for the fact that a dealer can be positioned long or short on securities. In a short position, when a dealer has lent cash against collateral, a fall in the price of collateral will result in margin payments to the dealer from the borrower of cash.

entity must either have cash or PMAs. The ability to participate in the absence of either is limited.

Having laid the building blocks for Pillar II of the liquidity regime, this chapter now turns to Pillar I of the liquidity regime.

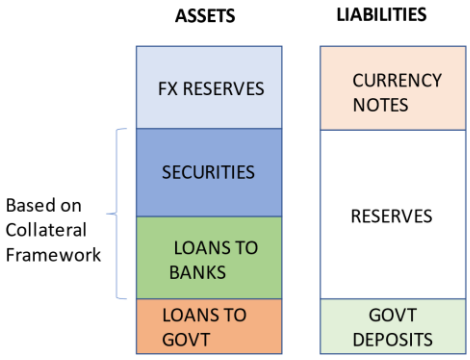
3.4 The Monetary Liquidity Framework

Central banks primarily enact monetary policy by adjusting the supply and demand for reserves. Reserves are deposit accounts that commercial banks hold with the central bank, and, hence, liabilities of the central bank. Any transaction by a central bank with a domestic entity results in the creation or destruction of reserves on the liabilities side of its balance sheet (Bindseil 2004, Rule 2015). A central bank's collateral framework spells out which assets the central bank will accept as collateral for its monetary policy operations and on which terms, and typically includes both marketable and non-marketable assets (BIS 2013, ECB 2014). The three dimensions of liquidity schema conceptualizes reserves creation by the central bank as the provision of monetary liquidity. The provision or withdrawal of monetary liquidity affects funding liquidity conditions of banks. If the central bank provides monetary liquidity by purchasing PMAs in exchange for newly created reserves, the market liquidity of PMAs increases (Gabor 2021).

However, reserves creation is not exclusively the result of discretionary monetary policy decisions by the central bank to achieve its price stability mandate (Gabor 2012, Painceria 2021). Reserves may be created outside the ambit of traditional monetary policy operations because of sovereign debt management and exchange rate management operations. A DEC central bank's balance sheet includes FX reserves and credit to government in addition to the assets that are included in the collateral framework (see Figure 3). Increases or decreases in these two items on the assets side of a central bank's balance sheet result in creation or destruction of reserves. For instance, when an DEC central bank buys an FX asset from another domestic bank it pays for its purchases with newly created reserves (Painceria 2021, Domanski et Al 2016). In most countries, the government, like the central bank, also has an account with the central bank. When the government spends money,

the central bank debits its account and credits the recipient bank's account, increasing the amount of reserves in the banking system. The government and the external sector are, thus, also involved in the process of reserves creation. The extent to which both these entities influence reserve creation differs depending on the monetary liquidity framework. Consequently, this thesis conceptualizes a monetary liquidity framework as a macro-financial framework representing the balance sheet relationships between the four key entities which are involved in reserve production—the central bank, commercial banks, the government, and global finance.

Figure 3: Balance Sheet of an DEC Central Bank



I adopt Epstein's (2006) conceptualization of Developmental and Neoliberal central banking to conceive the two types of monetary liquidity frameworks. The authors introduced the concepts to theorize the regime change in DEC central banking as part of the Washington Consensus reforms of the 1980s and 1990s (Williamson 2000). Developmental central banking is characterized by subordination of monetary policy to fiscal policy. The task of the central bank is to help finance the development plans of the Keynesian state, and it uses a combination of balance sheet actions and regulatory policy for this purpose (Onis 1991). Balance sheet actions include deficit monetisation and sectoral refinance to

banks, which is the provision of reserves to banks against bank loans to specific sectors. Regulatory policies include credit controls to direct credit towards target sectors and limit inflation by preventing credit bubbles (Bloomfield 1957). To insulate the country from the vagaries of cross-border flows, developmental central banking typically features capital controls (Wade 2018). From a monetary liquidity perspective, the actions that result in the creation or destruction of reserves include deficit monetisation, central bank refinance and maintenance of exchange rate pegs.

Developmental central banking was replaced by Neoliberal central banking as part of the Washington Consensus reforms. Neoliberal central banking is characterized by an absence of deficit monetisation, a hands-off policy towards exchange rate, capital account liberalisation and the absence of credit controls. The only responsibility of the central bank is inflation targeting, which it achieves through indirect tools such as controlling the short-term interest rate rather than direct tools such as credit controls. Policy actions that result in changes to the balance sheet of a neoliberal central bank include monetary policy implementation to reach its interest rate target, as well as exchange-rate interventions.

A monetary liquidity framework is the mechanism for creation of reserves and includes the policies that are enacted through the balance sheet of the central bank. Hence, a monetary liquidity framework consists of a combination of the monetary-fiscal nexus, exchange rate policy and capital account policy. Consequently, the Developmental monetary liquidity framework is characterised by deficit monetisation-capital controls-fixed exchange rates (DM-CC-FX), while a Neoliberal monetary liquidity framework features inflation targeting-capital account liberalisation-managed float (IT-KAL-MF).

3.5 Conclusion

This chapter introduced a theoretical framework based on the three dimensions of liquidity to study the role of central banks in shaping the institutional apparatus of liquidity production--or what Pape (2020) refers to as "liquidity regimes"—in different financial structures. It argued that the framework has the analytical

bandwidth to illustrate liquidity production in bank-based and market-based finance as well as to examine changes to balance sheet configurations resulting from financial innovation and policy changes. The three dimensions of liquidity represent the three different ways in which scholars have conceptualized liquidity—monetary liquidity, funding liquidity and market liquidity. The theoretical framework consists of two pillars, which are:

1) the monetary liquidity framework, which is the macrofinancial framework that underpins the production and destruction of reserves by the central bank.

2) the nexus between funding liquidity (ease of accessing cash) and market liquidity (ease of buying or selling securities).

To examine how the funding liquidity-market liquidity nexus operates in different financial systems, the chapter developed the concept of position-making structures, which build on Minsky's concept of position-making. A position-making structure refers to the money-market mechanism that enables financial institutions to meet the cash demands that arise from the financing of essential assets. It is of one of two types, depending on whether the purpose of the money market is to meet cash demands primarily arising from bank deposits issued by making loans (deposits-focussed position-making) or to enable the financing of securities by issuing repo liabilities (repo-focussed position-making). The position-making structures, in turn, map on to the two financial structures, bank-based finance and market-based finance.

The next chapter examines the operation of Pillar 1 of the liquidity regime. Through balance sheet illustration, it shows how government spending determines the creation of monetary liquidity in the Developmental framework, while capital inflows determine the creation of monetary liquidity in the Neoliberal framework.

Chapter 4 Pillar I: The Monetary Liquidity Framework

The previous chapter introduced a theoretical framework comprising two pillars based on the three dimensions of liquidity production. The first pillar is the monetary liquidity framework, which is the mechanism that governs the production and destruction of reserves by the central bank. Creation of monetary liquidity or reserves is the fulcrum through which a central bank controls credit creations in the economy. Reserves are also created and destroyed outside the ambit of traditional monetary policy operations because of sovereign debt management and foreign currency interventions by the central bank. This thesis conceptualizes a monetary liquidity framework as a macro-financial framework representing the balance sheet relationships between the four key entities which are involved in reserve production—the central bank, commercial banks, the government, and global finance. The monetary liquidity framework comprises the nexus between monetary policy and fiscal policy, capital account policy and exchange rate policy. This thesis adopts Epstein's (2006) categories of developmental central banking and neoliberal central banking as the two types of monetary liquidity frameworks. The Developmental monetary liquidity framework is characterized by subordination of monetary policy to fiscal policy, and features deficit monetisation, capital controls and fixed exchange rates (DM-CC-FX). The Neoliberal ML framework is characterised by central banking independence, and features inflation targeting, capital account liberalisation and floating or managed exchange rates (IT-KAL-MF).

Table 2 Two Types of Monetary Liquidity Frameworks

	Developmental	Neoliberal
Monetary-Fiscal Nexus	Fiscal Dominance	Fiscal Discipline, Central Bank Independence
Sources of Monetary Liquidity	Deficit Monetisation, Central Bank Refinance	Central Bank Repo, Open Market Operations, FX Purchases
Capital Account	Closed	Partially or Fully Open
Exchange Rate Policy	Fixed	Floating or Managed Float
Driver of Monetary Liquidity	Government Spending	FX Flows
Largest Component of Central Bank's Balance Sheet	Government Debt	Foreign Exchange Assets (in the case of DECs)

The purpose of this chapter is to use balance sheet analysis to show which factor determines the creation of monetary liquidity in each of the frameworks. It is divided into three sections. The first section gives a background on the move from Developmental to Neoliberal monetary liquidity frameworks in DECs. It includes the literature critical of Neoliberal central banking, which this thesis' theoretical framework contributes to using balance sheet analysis. The second section illustrate the balance sheet transformations involved in the creation of monetary liquidity in the Developmental framework, showing how government spending drives creation of monetary liquidity. The third section illustrates the operation of the Neoliberal framework, showing how capital floss dominate the creation of monetary liquidity.

4.1 From Developmental to Neoliberal Central Banking

The 1980s and 1990s were marked by a reconfiguration of the relationship between government treasuries and central banks as well as between treasuries and commercial banks, first in advanced countries, then in DECs. Releasing central banks from the obligation to monetise sovereign debt was one of the key tenets underpinning the reorganization of financial systems in DECs starting from the 1990s. High government spending enabled by monetisation of sovereign debt by the central bank was seen as the primary cause of high inflation (Fischer and Easterly, 1990). Deficit monetisation was supplanted first by money-supply targeting and then by inflation targeting. At the same time, DECs were encouraged to liberalise capital accounts and allow their currencies to float freely, in line with the influential Impossible Trilemma doctrine which held that countries could only choose two of the three options of an independent monetary policy, an open capital account and a fixed exchange rate (Obstfeld and Taylor, 1997). Since monetary policy independent of fiscal policy was non-negotiable and fixed exchange rate regimes had faced numerous crises, countries were advised to choose independent monetary policy, flexible exchange rates and an open capital account. The reasons cited in support of capital account liberalisation included the need for higher investment in low-savings capital-constrained countries (Lucas, 1990), the belief that foreign ownership of local assets would encourage macroeconomic discipline (Prasad and Rajan (2008); Kose, Prasad, Rogoff and Wei (2006); Rajan and Zingales (2003)) and also deepen local-currency financial markets (Mishkin (2006); Prasad and Rajan (2008)).

Enthusiasm for KAL varied among DECs, although the policy consensus was full capital account convertibility should be the ultimate goal (Chwieroth 2014, Prasad and Rajan (2005)). Asian policymakers were least keen on the floating exchange rate part of the framework. Singed by past currency crises, DECs were unwilling to let their exchange rates flow freely, a position characterized as "fear of floating"

in the mainstream international economics literature (Calvo and Reinhart 2000, 2002, McKinnon and Schnabl, 2004, Levy-Yeyati and Sturzenegger, 2007). A consensus soon emerged among DECs that "managed float" was the best choice of exchange rate regime, especially for export-oriented economies wary of overvalued exchange rates. The FX reserve accumulation that was a by-product of the managed float regime also reassured foreign investors that DECs had the resources to repay them if they chose to recoup their investments (Dooley et al. 2014). In the academic literature, several authors argued that managed floats were compatible with inflation targeting and even with gradual capital account liberalisation (Cavoli and Rajan (2003), Bofinger and Wollmershäuser (2003) Stone et al. (2009), Roger et al. (2009).

The IT-KAL-MF model has come under pressure in recent years. In 2012, the IMF officially dropped its longstanding opposition to capital controls at a time when DECs were struggling with a surge in capital inflows due to QE in advanced economies. In the academic literature, there is a growing consensus that large and volatile capital flows are destabilizing for DECs. Rey (2015) opened another front against free capital flows by resurrecting Guillermo Calvo's concept of the Global Financial Cycle (Borio 2019). The author showed that capital flows, asset prices and credit growth moved in tandem, driven by monetary policy in the "centre" country. Since capital flows were driven by this global financial cycle rather than macroeconomic conditions in the recipient countries, countries could not achieve monetary policy independence without directly controlling capital flows or indirectly managing the capital account through macroprudential measures. Following Rey (2015)'s key contribution, there was a raft of empirical research, mainly from the Bank of International Settlements (BIS), examining how the global financial cycle influenced monetary conditions in DECs (Bruno and Shin (2015), Sobrun and Turner (2015), Chui et al. (2014), Kamil (2008), Moutot and Vitale (2008)). The BIS research echoed a wide Post-Keynesian and critical literature that had long argued against inflation targeting (Epstein and Yeldan 2010, Cordero 2008, Vernengo 2008), capital account liberalisation (Chwieroth 2015, Gallagher et al. 2012, Grabel 2015, Alami 2019) and the combination of IT-KAL-MF

(Fitzgerald 2004, Gabor 2010, 2012, 2015, Kaltenbrunner and Painceira 2017) for increasing macro-financial vulnerabilities of DECs, reducing the policy space for macroeconomic management and incentivizing carry trading.

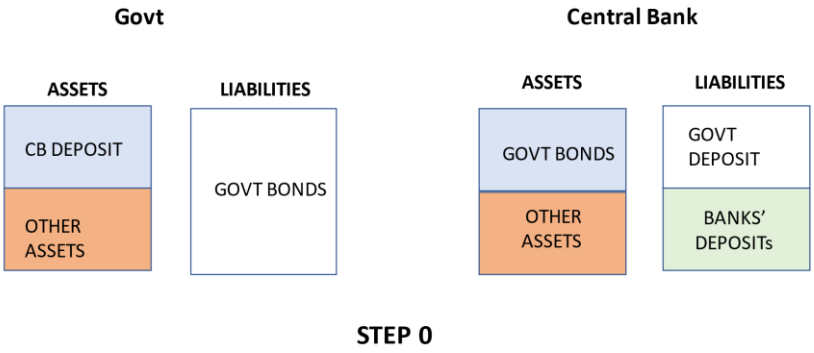
This thesis contributes to the literature critical of Neoliberal framework. Using balance sheet analysis, it examines the Developmental and Neoliberal framework in turn.

4.2 The Developmental Monetary Liquidity Framework

Under developmental central banking, deficit monetisation, or what Gabor (2021) refers to as "subordinated monetary financing" is the principal source of monetary liquidity, with central banks are relegated to the role of passive accommodators of the government's fiscal policy. The primary responsibility of the central bank is to keep the government's borrowing costs low. Under deficit monetisation, the central bank directly buys new government bonds and pays for them by crediting the account the government holds with the central bank (Blinder 1983). Government debt is, thus, directly monetised by the central bank, which creates new spending power at the disposal of the government. New reserves and bank deposits are created when the government spends.

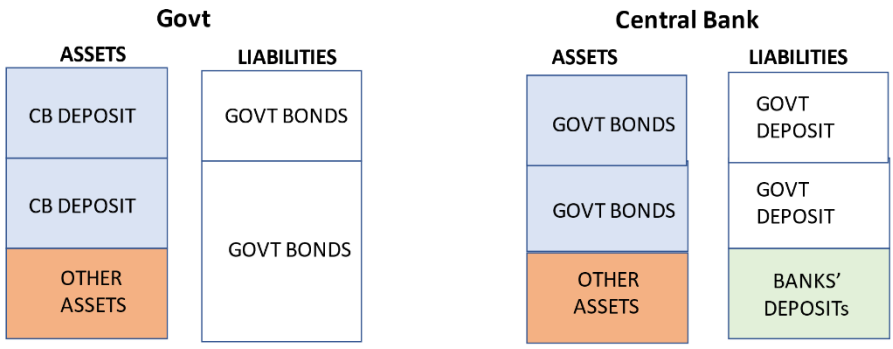
The process is illustrated with stylized balance sheets in figure 5.2

Figure 4. Deficit Monetisation



Step 0 shows the initial balance sheets of the government and the central bank[10]. The government's liabilities are bonds issued by it, while its deposit account with the central bank counts as an asset. Under debt monetisation, the government issues a bond that is directly purchased by the central bank by crediting the government's account with an amount equal to the value of the bond. This process leads to Step 1.

[10] For governments and households, assets may not equal liabilities. Governments and households, typically, have assets in excess of liabilities.



STEP 1

When the government spends, its account with the central bank is drawn down and the account of the recipient commercial bank with the central bank is credited with the same amount (not shown). This process results in the creation of new deposits and new reserves. If the central banks want to reduce the supply of reserves in the banking system, it sells government bonds from its portfolio to banks (Fullwiler et al. 2012).

FX flows have a very limited role in the creation of monetary liquidity or bank deposits in the developmental central banking. Since capital controls are in place, there are limited capital flows. Trade flows also face restrictions such as the requirement that all exports proceeds be sold to the central bank, and all imports needing prior approval of the authorities. Foreign-currency sales and purchases between local banks are restricted. The central bank is effectively the custodian of the country's foreign-currency assets.

To summarize, in the Developmental ML framework, new spending power is created when the central bank buys newly issued government by crediting the government's account with the central bank. Government spending results in the creation of new bank deposits and provision of monetary liquidity. Central banks are reduced to the passive role of accommodating government borrowing and withdrawing monetary liquidity from the system by selling government bonds from

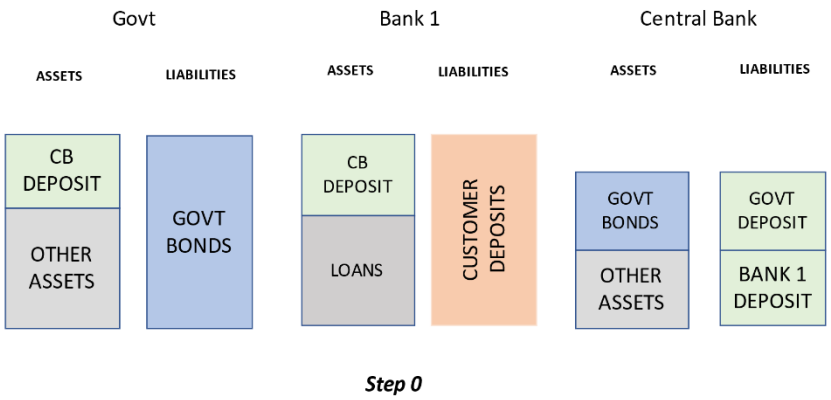
their own portfolio or by increasing reserve ratio requirements for banks. Therefore, central banks have relatively little control over the creation of new spending power in the economy. The ML framework is characterized by fiscal dominance of monetary policy.

4.3 The Neoliberal Monetary Liquidity Framework

Starting from the 1990s, central banks in DECs were released from the obligation to monetise fiscal deficits, which were considered the primary drivers of inflation. Instead, they were to focus on curbing inflation by controlling the money supply or interest rates. The other policy measures to reverse "financial repression" ranged from relaxation of liquidity ratios, abolition of administered rates and even privatisation of state-run banks in some DECs (Monnet and Vari 2019, Alejandro-Diaz 1983).

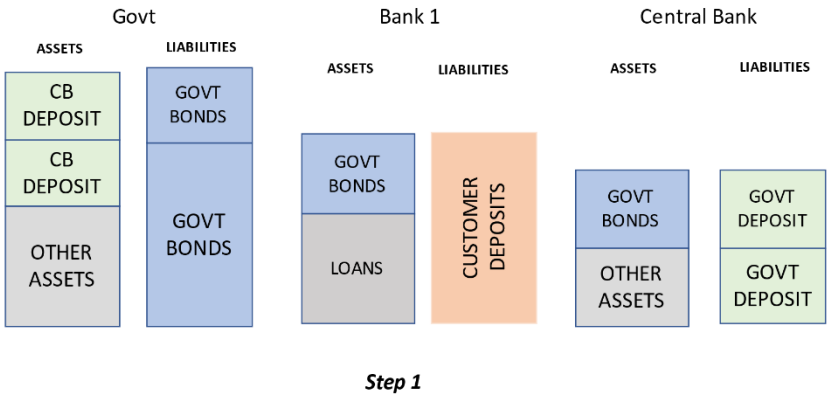
The upshot of these developments was governments could no longer depend on central banks to push through their borrowing programmes. Several countries enacted legislation prohibiting the central bank from purchasing newly issued government debt. Several DECs also enacted so-called fiscal responsibility laws, which placed limits on fiscal deficits (Mihaljek and Tissot 2003). Under this system, sovereign borrowing takes place as follows (see Figure 5)

Figure 5. Govt Debt Issuance in Inflation Targeting



Step 0 shows the balance sheets of the government, the central bank and a commercial bank. The central bank is barred from directly buying the government's bonds, which are issued through auctions involving commercial banks[11]. When a commercial bank buys a bond, the central bank debits the bank's account and credits the central bank's account with the same amount This stylized example assumes that the government also has a deposit account with the central bank, which is the case in India but not in many AEs (see Rule (2015) for an example of a central bank balance sheet where the government does not bank with the central bank).

[11] This discussion abstracts away the role of primary dealers in the process for simplicity of exposition.



Step 1

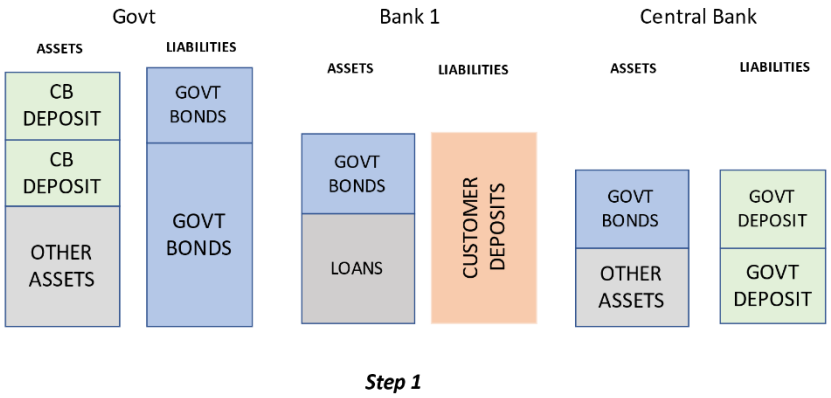
In this system, government borrowing reduces the quantity of reserves in the banking system (Gabor 2021). The government depends on the willingness of banks to hold its debt, while it's cost of borrowing is decided through bond auctions. The central bank is typically not responsible for conducting these bond auctions, with sovereign debt management delegated to an institution independent of the central bank to allow it to focus on price stability (Cassard and Folkerts-Landau 1997, Singh 2015). New spending power is created when bank issue loans against new deposits or when firms issue debt, which is initially bought by the investment bank arranging the debt issue with newly created bank deposits. The central bank seeks to influence deposit creation through its monetary policy. It varies the level of interest rates in the money market by buying or selling or lending against government bonds. Its monetary policy can make it more expensive for the government to borrow by increasing interest rates. The central bank can, in other words, impose "fiscal discipline" on the government, including via collateral frameworks (Minea and Tapsoba 2014, Vestergaard and Gabor 2022). Inflation targeting is thus characterised by fiscal discipline and independent central banks.

An inflation targeting central bank sets interest rates by providing or withdrawing monetary liquidity to influence the interest rate at which banks borrow reserves from each other (Bindseil 2004) (see next chapter for illustration of interbank

borrowing). It mainly injects monetary liquidity through repurchase operations or outright purchases of securities from commercial banks[12].

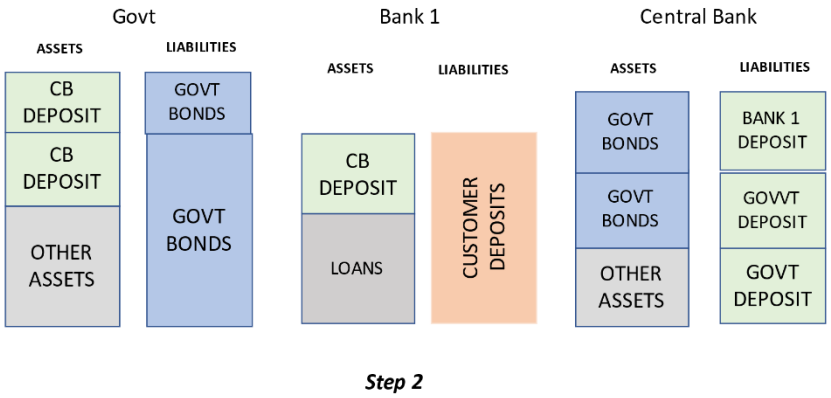
Figure 6 illustrates the outright purchase of securities from the central bank, which are also known as open market operations (OMOs). Step 1 is the starting point, which is identical to the previous illustration where the Bank 1 purchased a newly issued government bond, leading to a credit to the government's deposit account with the central bank and a debit to Bank 1's account.

Figure 6. Open market Operations



If the central bank wants to inject monetary liquidity, it could purchase the government bond from Bank 1 and pay for it by creating a new deposit for Bank 1. This process is shown in Step 2.

[12] Since the Great Financial Crisis, some central banks have resorted to unconventional monetary policy instruments such as interest on excess reserves used by the U.S. Federal Reserve.



Step 2

This process of injecting monetary liquidity by an inflation-targeting central bank not only improves funding liquidity conditions for Bank 1 but also increases market liquidity of government bonds. The central bank may use any security that is included in its collateral framework to carry out open market operations. Compared to AEs, collateral frameworks of DEC central banks are heavily biased towards government securities (see Chailloux et al. (2008), Box 2).

Along with inflation targeting, a neoliberal ML framework also includes capital account liberalisation and, in the case of Asian DECs, managed floating rates (IT-KAL-MF). FX flows to DECs rose sharply from the 1990s onwards due to capital account liberalisation. To examine the balance sheet dynamics of the IT-KAL-MF regime, it is first necessary to clarify how FX transactions play out on the balance sheets of local institutions.

4.4 FX Flows From a Balance Sheet Perspective

This thesis builds on the premise that all cross-border flows are ultimately transactions between local and overseas banks, and visualizes the balance sheets of the entities involved to examine the nature of these transactions, inspired by Kumhof et al. (2020), Gabor (2019) and Kohler (2022). The focus on settlement of cross-border transactions follows from the recent emphasis on gross flows in

the international macroeconomics literature, which had traditionally focussed on net flows (Shin (2012), Borio and Disyatat (2011), Obstfeld (2013)). Kumhof et al. (2020) distinguish between payment flows for trade in goods and services and financial flows to emphasize the point that capital flows do not finance trade imbalances but debt. The authors define a cross-border payment flow as "the cross-border transfer of a medium of exchange for settlement, from the buyer to the seller, whose inseparable counterpart is a flow of physical resources that crosses the border in the opposite direction" (Kumhof et al. 2020, p. 3). On the other hand, a financial flow entails "the transfer of a medium of exchange, from the buyer to the seller, whose inseparable counterpart is a flow of other gross financial assets that crosses the border in the opposite direction, without any role for physical resource flows" (Ibid). An outflow here refers to an increase in the seller's foreign-currency assets.

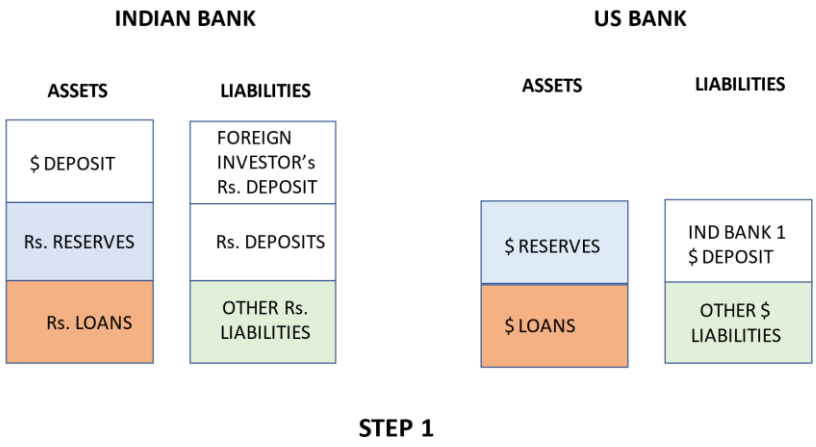
This thesis tweaks Kumhof et al.'s (2020) definition of a cross-border payment flow because its focus is not the balance of payments of a country per se but the effect of FX flows on local balance sheets. It defines an inflow as any transaction that results in an increase in the local banking system's foreign-currency assets without a parallel outflow of goods or services. An outflow, on the other hand, is a fall in the local banking system's FX assets without a parallel inflow of goods or services. In most non-dollarized economies, these FX assets are held offshore as deposit liabilities of banks based overseas. This definition of flows excludes imports and export payments but includes one-way cross-border transfers, such as inward and outward remittances, that are typically included in the current account of the balance of payments rather than in the capital account.

The BIS literature on cross-border flows distinguishes between the balance sheet effects of trade flows, such as exports and imports, and capital flows. It assumes that only net exports result in the creation of new local bank deposits when the exporter remits her export earnings into the local currency (Mehrotra 2012, Filardo and Grenville, 2011). However, I argue that like exports, capital inflows, also result in the creation of local bank deposits, and, thus, new spending power. This is because the local banking system must pay for any increase in its foreign-currency assets by issuing either local-currency or FX liabilities due to the nature of double-

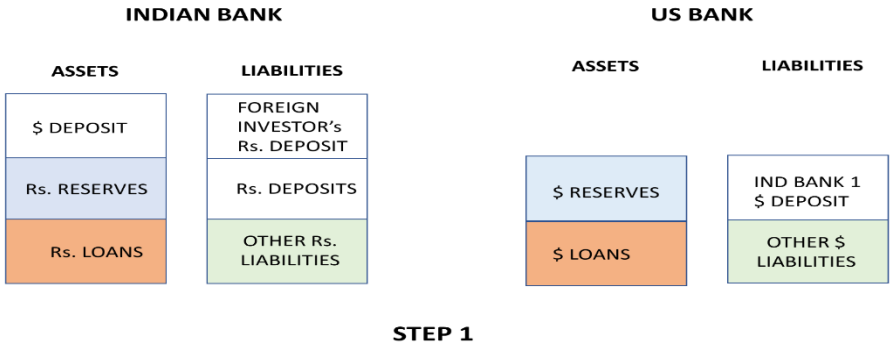
entry bookkeeping. Exports, inward remittances and foreign investment in local-currency assets are examples of inflows (increase in banking system's FX assets) paid for by local-currency deposit liabilities. For instance, in the case of a U.S-based investor buying rupee-denominated bonds on the secondary market in India, the investor's U.S. bank would transfer dollars to the Indian bank's correspondent bank in the U.S. The Indian bank would create a rupee deposit for the foreign investor in India against its own FX deposit with the U.S. bank, before transferring rupees to the bond seller's account. On the other hand, a foreign-currency loan availed by an Indian entity is an example of an inflow paid for by issuing foreign-currency liabilities. Both types of inflows result in the creation of new local bank deposits.

The following stylized examples illustrate each kind of inflow. In the first example (figure 7), a foreign investor who holds a dollar deposit with a U.S. based bank decides to purchase an existing rupee-denominated bond in India on the secondary market (local currency is rupee, abbreviated as Rs.)

Figure 7. FX Inflow Funded by Rupee Liability

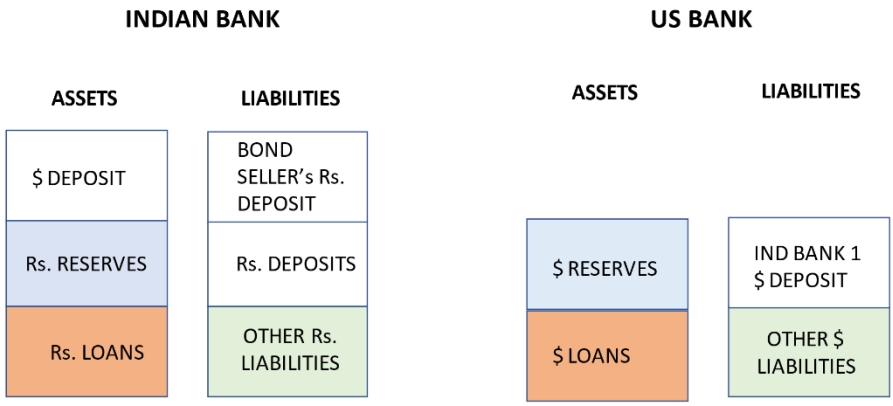


She instructs her bank in the U.S. to transfer the dollar amount to the bond seller's bank in India[13]. For simplicity, I assume that the same U.S. bank is the clearing bank for all the Indian entities involved, including the Indian central bank, while the Indian bank holds the deposits of the foreign investor as well as the Indian seller of the bond. The U.S. bank simply debits the foreign investor's deposit account and credit the Indian bank's deposit account with the same amount, while the Indian bank books a rupee deposit against the dollar asset it now holds (Step 1).



To complete the security sale, the Indian bank simply transfers the rupee deposit from the foreign investor's name to the Indian bond seller's name (Step 2).

[13] Such a transaction would typically involve an exchange or clearing house in India who would coordinate the delivery of funds and the security and a custodian who would hold the security on the foreign investor's behalf in India. However, for simplicity, this transaction is visualised as an interbank transfer of funds between the bond seller and the foreign investor.



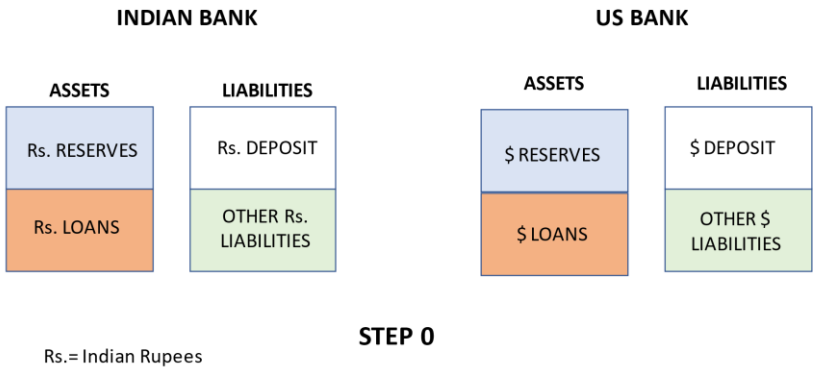
STEP 2

The local banking system thus gains a dollar asset which is acquired by issuing a rupee liability (deposit at the Indian bank), resulting in the creation of new spending power. From a balance sheet perspective, the process is similar to when a bank makes a local-currency loan, which it pays for by issuing a deposit in the name of the borrower, creating new spending power. This is the case even if the foreign investor is buying an existing bond on the secondary market, not a newly issued one. In contrast, a local non-bank investor buying an existing local-currency bond simply involves the transfer of existing spending power. The seller of the bond would gain a bank deposit and the buyer of the bond would lose a deposit with their respective banks transferring reserves to complete the transaction, resulting in no net addition to deposits in the banking sector.

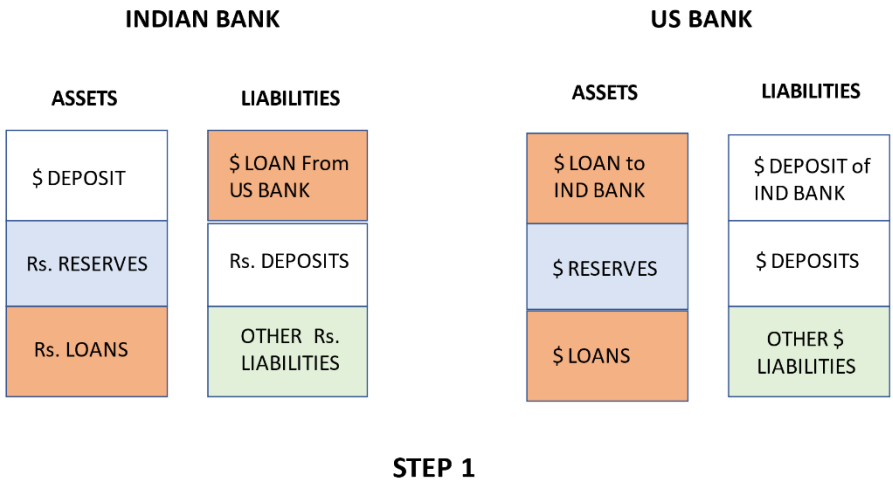
When the foreign investor wants to sell her investment and remit the proceeds, she first sells her security locally to gain a rupee bank deposit. To remit the proceeds of the bond sale, the Indian bank draws down its own foreign-currency deposit while extinguishing her local-currency deposit, thereby destroying spending power (not shown). The U.S. clearing bank reverses the steps it had followed, crediting the foreign investor's U.S. account and debiting the Indian bank's account.

To illustrate the second type of inflow (FX inflow funded by Dollar liabilities), suppose an India-based firm wants to take advantage of lower interest rates in the U.S. and take out a loan denominated in dollars to buy new factory equipment in India. Since U.S.-based banks would be unwilling to issue a loan to a foreign firm whom they have not done business with before, the Indian corporation approaches its bank in India. Step 0 of Figure 8 shows the initial balance sheets of the U.S. bank and the Indian bank.

Figure 8. FX Inflow Funded by Dollar Liability

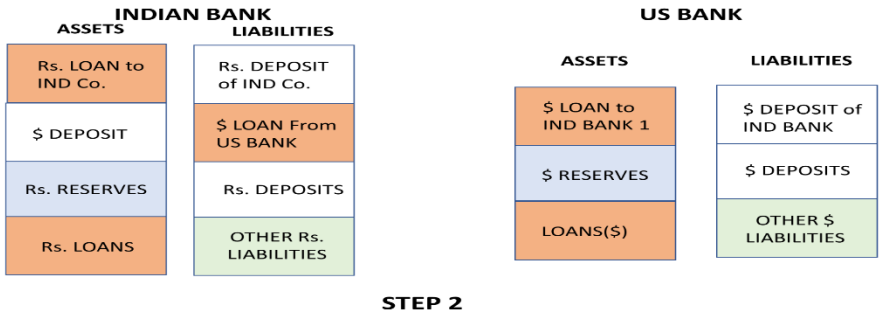


The Indian bank takes out a dollar-denominated loan from the U.S. bank on behalf of its client. The U.S. banks creates a dollar deposit for the Indian bank against a dollar loan on the asset side, while the Indian bank has a dollar deposit on the assets side against a dollar liability (Step 1).



STEP 1

The Indian bank then issues a rupee-denominated loan for the Indian corporation funded by a rupee deposit (Step 2).



STEP 2

If it needs rupee reserves in the future, the Indian bank can sell the dollar asset to another Indian bank. When the dollar loan comes due, the Indian bank must draw down its own foreign-currency assets or buy dollars in exchange for rupees from another Indian bank or take a foreign-currency loan. Redemption of the foreign investment in Case 1 is functionally equivalent to maturity of the dollar loan in Case 2.

In the second case, the FX inflow is funded by a FX liability in the first instance and subsequently generates a local-currency liability when the bank issues a local-currency loan. Hence, both types of inflows create new spending power in the form

of new deposits. These new deposits create new demands for monetary liquidity which an inflation targeting central bank must accommodate to keep interest rates in line with its target. Consequently, capital flows reduce central banks' discretion in the creation of new liabilities, and hence new spending power.

Crucially, capital inflows increasingly depend on funding liquidity in the source country rather than in investment prospects of the recipient country (Rey 2015, Kaltenbrunner and Bonizzi 2020). During quantitative easing, easy monetary policies in the West caused a surge in capital inflows, while the fears that the U.S. Federal Reserve would tighten monetary policy sparked heavy capital outflows in 2012-13. Capital flows also introduce pro-cyclicality in the conduct of monetary policy (Filardo and Grenville 2012). For instance, a central bank might increase interest rates in response to the additional deposit creation due to capital inflows. However, higher interest rates are likely to attract further debt inflows from carry trade investors searching for higher yield, stymieing the central bank's efforts to tighten monetary policy (Mohanty and Turner 2008).

After exploring the interaction of inflation targeting and capital flows from a balance sheet perspective, the next section incorporates the exchange rate leg of the framework.

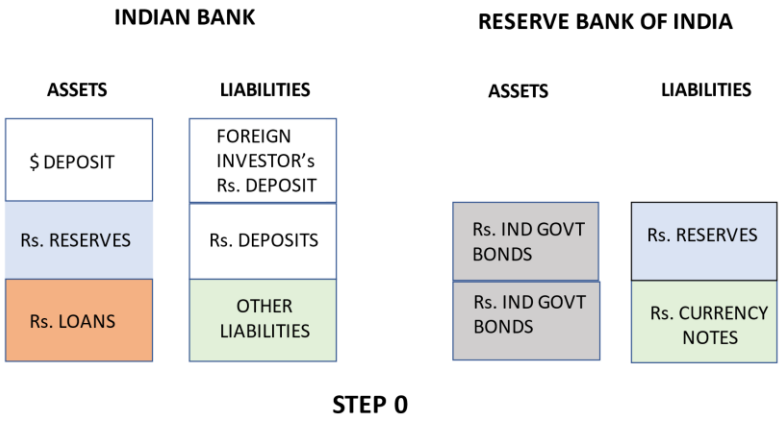
4.5 Managed Float: FX Intervention and Sterilization

Most Asian DECs adopted the policy of managed floats to prevent currency overvaluation. FX inflows, either due to capital inflows or export receipts, cause the local currency to appreciate, reducing the competitiveness of exports. To prevent the local currency appreciating, the central bank buys FX assets from local banks, paying for the FX assets by crediting the banks' accounts with the central bank (creating new reserves). This process is known as FX intervention. However, under inflation targeting regimes, central banks must ensure that short-term interest rates coincide with their target. An increase in reserves due to FX purchases puts downward pressure on interest rates. To keep short-term interest rates on target, the central bank sells bonds from its holdings to mop up excess reserves, in a process known as FX sterilization. In this way, EM central banks use

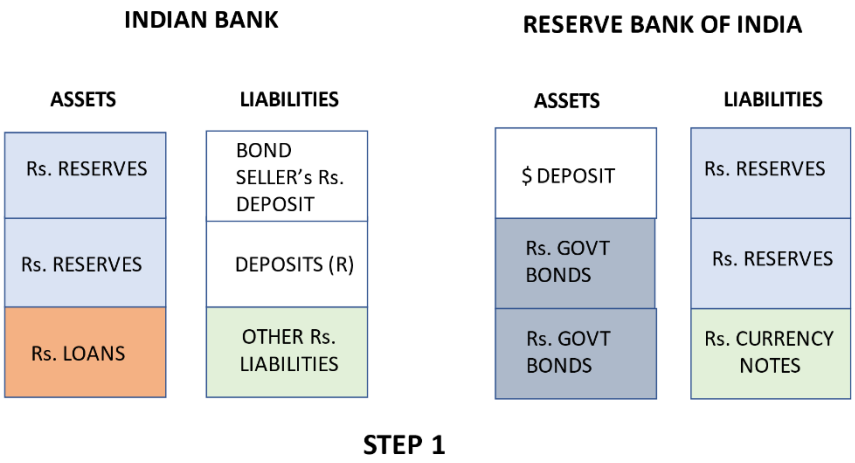
the tools of FX intervention and sterilization to manage their currencies and maintain short-term interest rates at target.

The following figure (Figure 9) illustrates the processes of FX intervention and sterilization. Step 0 shows the initial balance sheets of an Indian commercial bank and the Indian central bank.

Figure 9. FX Intervention



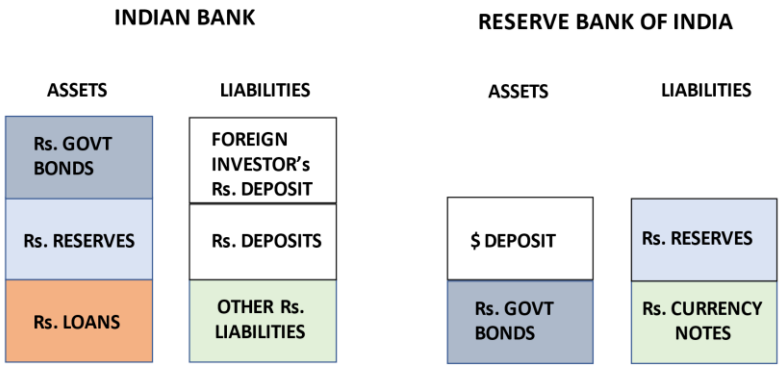
The RBI buys dollars from the Indian bank and pays for its purchase with newly created reserves and monetary liquidity, expanding its balance sheet (Step 1). Assuming the RBI has the same clearing bank as the Indian bank in the U.S., the U.S. bank simply debits the deposit account of the Indian bank and credits the deposit account of the RBI (not shown). Consequently, both the Indian bank's and the RBI's balance sheets expand as a result of the foreign investor investing in a rupee bond and the RBI intervening in the FX market to purchase those dollars.



Since FX intervention increases the supply of local-currency reserves, pushing local interest rates lower, illiquid central banks sterilize their purchases of FX assets. Although a central bank can use non-market-based tools such as raising the cash reserve ratio, sterilization typically involves the central bank selling bonds from its portfolio to drain the reserves (Mehrotra 2012, Filardo and Grenville 2012).

Figure 10 illustrates sterilization through the RBI selling bonds from its existing portfolio, with the previous figure serving as the initial position. The RBI's balance sheet contracts as the reserves transferred by the bank to pay for the bond are extinguished. If the RBI issues new bonds of its own, its balance sheet does not contract (not shown). When government bonds are used for sterilisation, the reserves that the bank uses to pay for the bond are extinguished, causing a contraction in the RBI's balance sheet. From the bank's perspective, the transaction is a swap of assets from reserves to government bonds.

Figure 10. Sterilization



However, balance sheet analysis shows sterilization does not destroy the new spending power created by FX inflows, as the original bank deposit created due to the FX inflow remains. From a bank's perspective, it is an asset-side transaction which swaps reserves for government bonds, which are essentially position-making assets (PMAs). The spending power created through FX inflows is not sequestered since reserves converted into PMAs can be converted back into reserves by the bank if the need arises, as Filardo and Greenville (2012) acknowledge. In monetary terms, sterilization is not equivalent to stuffing currency notes under the mattress. Empirical research from the BIS shows that an increased supply of sterilization bonds is correlated with a lagged surge in credit growth (Filardo and Grenville 2012, Vargas et Al 2013, Gadanecz et al. 2014, Mohanty 2013). To be effective, sterilization must be coupled with blunter instruments such as raising liquidity ratios or raising reserve requirements, which hark back to the era of financial repression.

The Neoliberal framework, thus, replaces fiscal dominance of monetary policy with global dominance. In addition, the framework "de-risks" DEC assets for carry trade investors (Gabor 2020, Mushtaq 2021). Inflation-targeting and sterilization lend certainty to carry trade investors that the central bank will maintain interest rates in line with its inflation target, allowing them to take positions accordingly

(Kaltenbrunner and Painceira 2017). Intervention provide assurance to carry trade investors that the central bank will defend the exchange rate against sharp depreciation, protecting their investments from currency loss. Consequently, inflation targeting with capital account liberalisation replaces fiscal dominance of monetary policy with external dominance of monetary policy.

4.6 Conclusion

The chapter elaborated the concept of a monetary liquidity framework, which is the first pillar of a liquidity regime and reflects the mechanism that governs the production and destruction of reserves by the central bank. This thesis conceptualizes a monetary liquidity framework as a macro-financial regime linking the four entities involved in reserve production—the central bank, the government, the external sector and commercial banks in a specific configuration. A ML framework consist of the monetary-fiscal nexus, capital account policy and exchange rate policy. This thesis adopted Epstein and Yeldan (2009)'s categorization of Developmental and Neoliberal central banking.

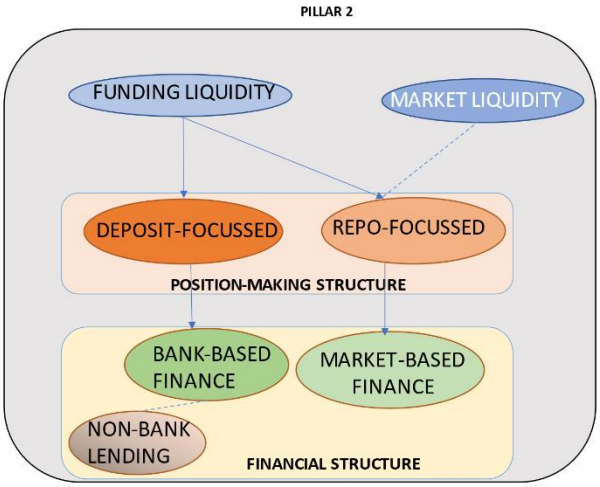
This chapter analysed both frameworks using the Minksyian technique of balance sheet analysis. First, it showed how the Developmental ML framework is characterised by fiscal dominance of monetary policy, with the government rather than banks responsible for the creation of new spending power. Next, it analysed the Neoliberal IT-KAL-MF framework showing that capital inflows, like deficit monetisation, results in the creation of new deposits, complicating efforts of central banks to manage the creation of new spending power in the economy. This new spending power is not destroyed unless the capital inflows are reversed. Rather than increase market liquidity of local-currency securities, the increased deposit creation creates additional position-making requirements and an increased demand for monetary liquidity. FX intervention and sterilisation de-risk government securities for foreign portfolio investors, attracting more inflows. However, even if the central bank chooses not to intervene in the currency markets, it must meet the additional demand for reserves arising from the increased deposit creation to

keep its policy rate in line with the inflation target. Consequently, inflation targeting with capital account liberalisation replaces fiscal dominance of monetary policy with external dominance of monetary policy.

Chapter 5 Pilar II: Position-Making Structures and Financial Structures

This chapter focusses on Pillar 2 of the liquidity framework, which is centred on the funding liquidity-market liquidity nexus (see Figure 11). Chapter 3 elaborated Minsky's concept of position-making and position-making assets (PMAs) before introducing the concept of position-making structures (PMS) as an analytical tool to theorize the wiring of the money market in different financial structures. Position-making is the act of acquiring cash to maintain positions in essential assets, while PMAs are the assets used to acquire cash. This thesis conceptualizes PMS as money-market configurations that enable position-making. The two types of PMS are deposit-focussed and repo-focussed, depending on whether the essential asset to be financed is a bank loan or a security. The former is configured to meet cash needs arising from deposit liabilities incurred primarily during loan-making (but also from financing foreign-currency inflows, as the previous chapter showed), while the latter enables the financing of securities through the issuance of repo liabilities. Deposit-focussed PMS and repo-focussed PMS are the respective money-market configurations for bank-based finance (and its offshoot, non-bank lending), and market-based finance.

Figure 11. Pillar 2 of a Liquidity Regime



This chapter has three purposes: 1) to show how each PMS (money market configuration) undergirds its respective financial structure, bank-based finance or market-based finance 2) to illustrate the working of each PMS through stylized balance sheets and clarify the difference between collateralised borrowing in a deposits-focussed PMS and leveraged trading of collateral in repo-focussed PMS 3) to compare the two financial structures along the following criteria: destabilizing tendencies, types of crises, stabilization mechanisms, and the role of the central bank in each financial structure (see Table 3).

Table 3 Financial Structures

	Bank-based	Market-based
Position-Making Structure	Deposits-Focussed	Repo-Focussed
Essential Asset	Bank Loans	Securities
Purpose of Money Market	Accessing cash	Financing Securities
Key Entities	Banks	Dealer-Banks, Cash Pools, Long Pools, Clearing Banks
Source of Vulnerability	Speculative and Ponzi Loans	Procyclical leverage (tied to price of collateral)
Stabilization principles	Leverage restrictions on money market participants, micro-prudential and macroprudential regulation of banks	Credit ratings of collateral, margin/haircut requirements based on collateral prices, micro-prudential regulation of banks
Types of crises	Bad-loans crises, runs on banks	Liquidity Spirals, Runs on repos
Role of Central Bank	Monetary policy authority, financial regulator, macroprudential regulator, lender of last resort	Monetary policy authority, dealer of last resort

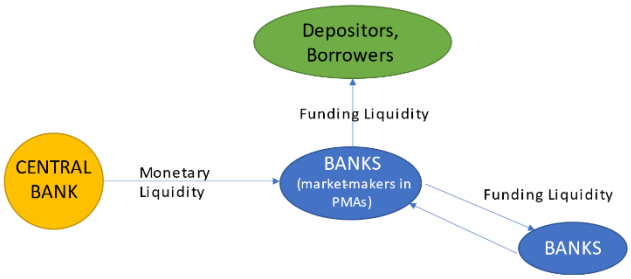
This chapter shows that the key differences between a deposits-focussed and repo-focussed PMS hinges on what financial institutions can or cannot do with collateral in the money market. Leverage of collateral ties funding liquidity and market-liquidity in a feedback relationship in repo-focussed PMS (Brunnermeir and Pedersen 2009, Gabor and Vestergaard 2016). Deposit-focussed PMS, on the other hand, places restrictions on leveraged trading of collateral to make it difficult to finance securities on the money market.

This chapter starts by describing bank-based finance in terms of the three dimensions of liquidity schema before illustrating the working of deposits-focussed PMS in bank-based finance. It then discusses systemic risks in bank-based finance and the role of the central bank. This process is repeated for market-based finance.

5.1 Bank-based Finance

Figure 12 illustrates the links between the various entities involved in liquidity production in bank-based finance, drawing on Neilson (2019) and Foucault et al. (2013). The central bank provides monetary liquidity to the banking system. Banks provide funding liquidity to depositors and borrowers and to each other.

Figure 12. Liquidity Production in Bank-Based Finance



Banks also play the role of market-makers in position-making assets (PMAs) as regulators are wary of leveraged dealers making markets in PMAs. This representation is consistent with Stage 5 of Chick's (1986, 1993) stages-of-banking-development framework, which theorizes the sequential changes involved in the evolution of the financial system of a market economy. Stage 5 is characterised by the acceptance of bank deposits as a means of payment (allowing banks to provide funding liquidity to depositors and borrowers), the presence of an interbank market for funds (allowing banks to provide funding liquidity to each other) and the presence of a central bank (which provides monetary liquidity to banks and acts as a lender of last resort) (Dow et al. 2008). This simple model does not include non-bank lending companies which feature in Stages 6 and 7 of Chick's framework as competitors to banks. Neither does the model include cash-rich institutions such as insurance and pension funds, which also features in some DECs. However, the presence of these investors creates new funding liquidity chains (which are documented in Chapter 9 in India's case) without affecting the fundamental feature of bank-based finance, which this thesis argues is the marginalization of leveraged traders in the money market.

The next section illustrates the working of a deposits-focussed PMS.

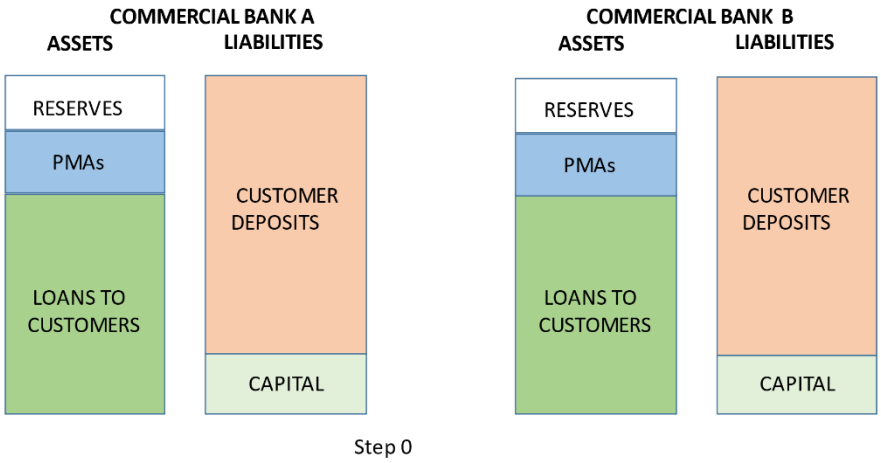
5.2 The Working of Deposits-Focussed PMS

There are four principal ways for a bank to make position in a deposits-focussed PMS. These are:

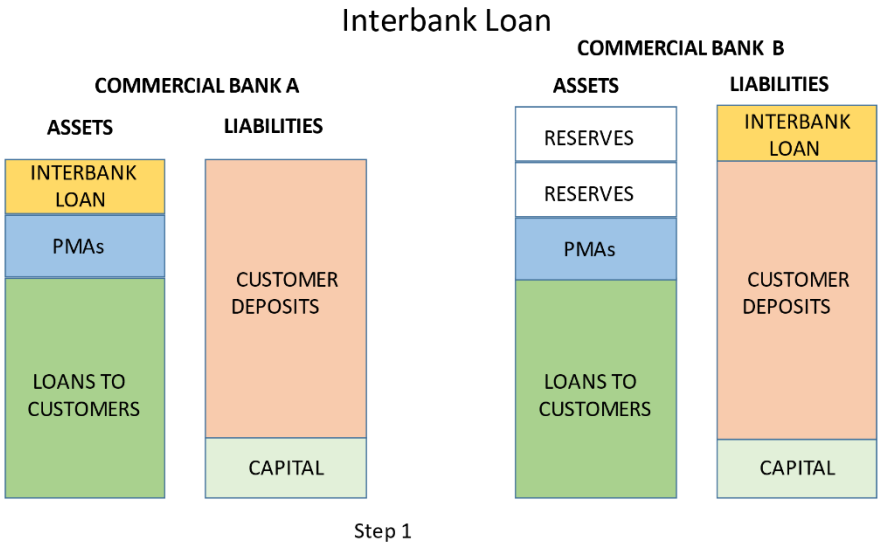
1) Accessing monetary liquidity from the central bank's standing facility, which is often limited in amount and carries a stigma since its use indicates a weak funding liquidity position (Bindseil and Jablekci 2011).
2) Borrowing reserves without collateral in the unsecured interbank market.
3) Selling PMAs to another bank in exchange for reserves
4) Borrowing reserves from another financial institutions against PMAs in a pledge repo transaction, where the legal ownership of collateral remains with the borrower of cash (ASIFMA, 2017)

Figures 13 illustrates the balance sheet transformations involved in position-making that does not involve the central bank's standing facility. Step 0 show the identical balance sheets of two commercial banks, which consist of customer deposits and capital on the liabilities side and reserves, PMAs (examples) and customer loans on the assets side.

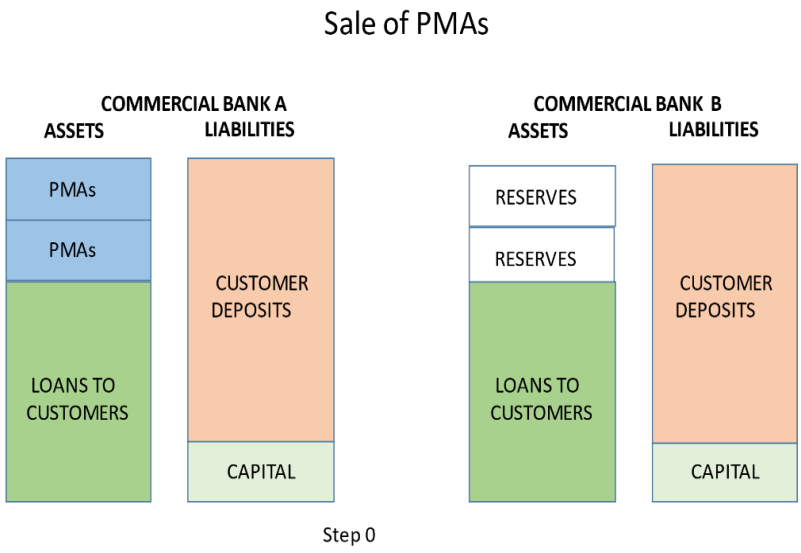
Figure 13. Operation of Deposits-Focussed PMS



The first option for a bank which wants to make position is an unsecured interbank loan. This transaction results in an expansion of its balance sheets with reserves on the asset side and an interbank loan on the liabilities side. Bank A simply swaps reserves for an interbank loan on the assets side (shown as step 1).

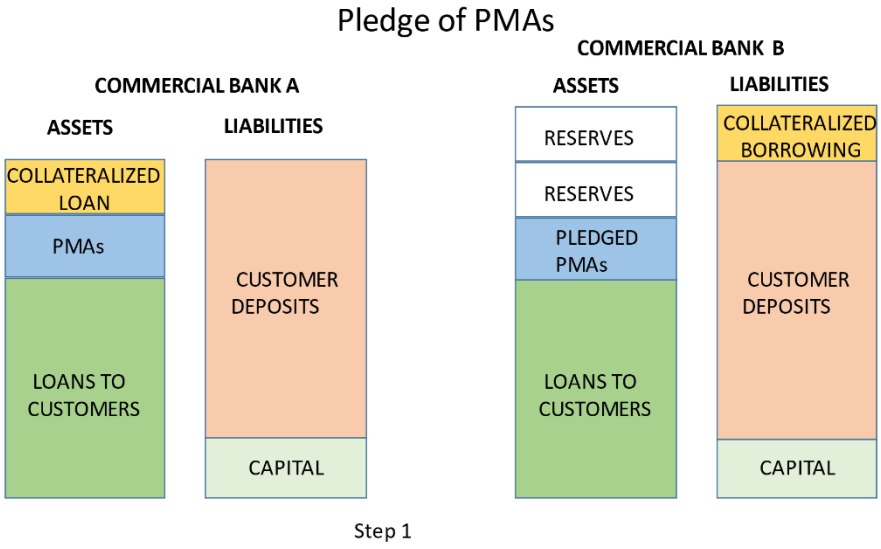


The second option is Bank B sells a PMA to bank B in exchange for reserves. This transaction simply involves a swap of assets between the banks with no change in the size of the balance sheet of another bank (shown as Step 1).[14]



The third option is for bank B to pledge PMAs in exchange for a loan of reserves to Bank A. This results in an increase in balance sheet of bank A with reserves on the asset side and a collateralised borrowing liability. Bank A swaps reserves for a Collateralised Loan on the assets side (shown as Step 1).

[14] The question is why Bank B would sell or pledge PMAs if it could borrow reserves without collateral in the interbank market. Most banks have counterparty limits on how much they can lend to another bank without collateral. Some regulators also place restrictions on how much a bank can borrow in the unsecured interbank market, as is the case in India. In addition, collateralised borrowing is typically cheaper than unsecured borrowing.



The collateral does not appear on the balance sheet of Bank A because legal ownership of a collateral stays with the entity which has posted collateral (Bank B) in a pledge repo transaction, unlike a classic repo (ASIFMA 2017). Consequently, Bank A cannot sell or re-pledge the PMAs. Reuse of PMAs enables traders to take leveraged positions in securities, as will be illustrated in the next section (Brumm et al., 2018, Gabor and Vestergaard 2016). Regulators restrict leveraged trading in PMAs are more concerned with price volatility of PMAs rather than market liquidity of PMAs. Sharp price swings could jeopardize PMAs role in providing funding liquidity. In countries where central banks are also sovereign debt managers and government securities are the main type of PMAs, central banks are concerned with price volatility of PMAs from a debt management perspective (Volcker 2002, Kuttner 2006). To make PMAs a less attractive asset class for leveraged traders, regulators may ban or impose restrictions on short-selling to make it difficult for investors to bet on price falls of PMAs (Mohanty 2002, CGFS 2014).

Consequently, there is no feedback relationship between funding liquidity of banks and market liquidity of PMAs. While market liquidity of PMAs depends on the willingness of banks to make markets, illiquid PMAs can also be used to access funding liquidity. A deposits-focussed PMS has mechanisms such as using the face

value of the security rather than market price in a collateralised borrowing (pledge repo) transaction or the use of "model" prices (price calculated by using a pre-agreed formula). Central banks may also use the face value or model prices to inject monetary liquidity against illiquid PMAs, as was the case in India.

5.3 Systemic Risks in Bank-Based Finance

Systemic risks in bank-based finance arise from changes in liabilities structures of corporations over a credit cycle. Minsky (1986[2008]) conceptualized liability structures of corporations as being of three types based on how their cash inflows from business activities compare with their debt levels: Hedge (realized and expected income cash flows exceed payment commitments); Speculative (income cash flows only sufficient to service interest payments, not principal) or 'Ponzi' liability structure (cash inflows neither sufficient to cover interest nor principal payments). Speculative and Ponzi structures rely on rolling over existing debt and taking on new debt to meet payment commitments on liabilities, respectively. Minsky's Financial Instability Hypothesis proposed that liability structures change endogenously, becoming increasingly fragile over the course of a credit cycle (Nesvetailova 2007, Frenkel and Repetti 2009, Bhattacharya et al. 2015). During periods of tranquillity, steady cash inflows from business activities prompt non-financial corporations to increase productive capacity, which stokes the demand for capital assets (Kindleberger and Aliber 2005). As prices of capital assets rise in response to demand, banks and financial institutions become increasingly optimistic about the ability of firms to repay the debt taken on to finance those assets. This leads to a higher tolerance for speculative and Ponzi structures. Consequently, the tendency towards instability is hardwired into capitalist financial systems—stability breeds instability.

Crises in bank-based finance typically occur due to an interruption of loan repayments to banks from non-financial corporations with speculative or Ponzi liabilities structures (Neilson 2019). As loan defaults increase, it leads depositors to question the standing of the bank, especially those depositors who hold deposits in excess of the deposit insurance ceiling. Other creditors of the distressed bank, such as other banks, may also refuse to lend it reserves in the interbank market,

making it more difficult for the distressed bank to make position. If the bank's loan losses exceed its capital base or it lacks good-quality collateral to borrow reserves from the central bank, the bank may either go bankrupt or may have to receive a government bailout to increase its capital base. The risk of contagion arises from money-market liabilities of the distressed bank, such as unsecured borrowing in the interbank market and certificates of deposits. Defaults on money-market liabilities by the distressed bank could lead to other financial institutions struggling to make position (Bordo 1989).

5.4 Role of the Central Bank in Bank-based Finance

The enmeshing of monetary policy with supervision is a crucial aspect of bank-based finance, with central banks playing the role of both monetary policy authority and financial regulator (Sayers 1957). Access to the central bank's balance sheet during good times and bad is conditional on commercial banks submitting to the central bank's regulatory authority (Sissoko 2019). Central banks are vested with discretionary powers to regulate the financial system as the "risks bankers carry are not objective probability phenomena, they are uncertainty relations that are subjectively valued" (Minsky 1984[2008], p. 267).

The supervisory role of central banks differs during normal times and crisis times. In normal times, central bank supervision focusses on preventing bad loans, runs on banks and leverage in the money market, as discussed in the previous section. Crucially, the regulatory ambit of central banks extends beyond ensuring that individual institutions are complying with rules (micro-prudential regulation) to macroprudential regulation of the financial system as whole (Baker 2013). Central banks must "lean against Ponzi and speculative" structures (Minsky (1986[2008]). Macro-prudential tools include increasing loan-to-value ratios or increasing capital charges for loans to the sectors that central bankers feel are at risk of speculative or Ponzi liabilities structures (Moutot and Vitale 2008). Crucially, central banks can tweak rules in response to an increase in speculative activity in a particular sector of the economy according to their discretion.

In crisis times, central banks play the role of lender of last resort (LoLR), an idea first propounded by Thornton (1802). Walter Bagehot, whose articulation of LoLR is the most well-known, argued that to avert panic, central banks should "lend early and freely (i.e. without limit), to solvent firms, against good collateral, and at high rates", (Bagehot 1873). While the classical version of LOLR emphasizes lending to illiquid but solvent firms, some authors such as Goodhart (1985, 1987) argue it is impossible to distinguish illiquidity from insolvency (see Bordo (1989) for a summary of different conceptualizations of LoLR).

Although the focus of LoLR is to save certain firms, decisions on which firms to save include decisions on which collateral to accept from those firms. During crises, central banks come under pressure to lend to a wider group of institutions, such as non-bank lenders or money-market mutual funds, and expand their collateral frameworks by lending against a wide variety of both liquid and illiquid assets. As Minsky ([2008]1986) points out, how central banks discharge their LoLR functions is crucial because it puts the central bank's *imprimatur* on institutions that the central bank could be counted on to support during subsequent crises.

> The lender-of-last-resort intervention is a delicate operation that allows particular units and branches of industry to fail even as it assures that the total available financing does not collapse (Minsky [2008]1986, p.358).

Central banks must use LoLR judiciously as a disciplining device to discourage excessive credit creation (Sayers 1957). LoLR entails discretionary judgement of the central bank on how to balance strictness and leniency as the former could fail to stabilize the financial system while the latter could set the stage for destabilizing credit expansions in the future.

This chapter will now examine repo-based position-making and the corresponding financial structure of market-based finance.

5.5 Market-based Finance

In market-based finance, also known as shadow banking[15], loans that remain on banks' balance sheets are not the main sources of credit, and bank deposits are not the main type of liabilities in the financial system (Hardie et al. 2013). From a Minskyian perspective, the "essential asset" that needs to be financed in the money market is not bank loans, but securities. Hence, unlike in bank-based finance, there is not distinction between essential assets and PMAs, with both types of assets collapsing into the common category of 'collateral'. The universe of collateral is much larger than of PMAs in deposits-focussed PMS, and, at least before the GFC, included both sovereign and private collateral, such as mortgage-backed securities, and asset-backed securities. Non-marketable assets such as bank loans are converted into securities by the process of securitization to serve as collateral (Claessens et Al. 2012, Acharya et Al. 2013). Securitisation is the process of slicing loans of different risk profiles and pooling them into securities to diversify risk. Since the GFC, financial sector regulations have reduced the use of private-sector assets as collateral in repos (Pozsar 2105, Sissoko 2019). However, as Sissoko (2019) points this does not imply that only government bonds are financed on the repo market as sovereign collateral can be reused to borrow cash to invest in riskier private-sector assets.

Market-based finance is undergirded by a repo-focussed PMS, which enables financial institutions to finance securities in the wholesale repo money market by issuing repo liabilities (Mehrling 2011, Claessens et al. 2012, Pozsar 2014, Gabor 2018). A repo-focussed PMS connects entities which require safe, short-term investments such as institutionalized cash pools, with entities that demand leverage, such as hedge funds and dealers, with dealer-banks or clearing banks connecting the two (Pozsar 2013, 2014, Sissoko 2019, Gabor 2019). Claessens et

[15] The mainstream literature (for eg. Adrian (2010), Adrian and Jackson (2018)) refers to the pre-GFC system of market-based finance, characterised by risky securitisation practices, as shadow banking. Due to securitisation regulations put in place after the GFC, the use of private-sector assets as collateral in repos in the U.S. has fallen sharply (Sissoko 2019). In the mainstream literature's view, market-based finance is shadow banking stripped off its risky practices such as opaque securitisation and credit enhancement. However, critical authors such as Gabor (2018) and Sissoko (2019) are sceptical of this distinction, arguing that repo financing is the key element of market-based finance and that the use of sovereign bonds rather than private-sector assets in repos does not address its key fragilities.

al. (2012) refer to this process as 'collateral intermediation' between investors who demand safety and those who demand leverage.

The key difference between repo-focussed PMS and the deposits-focussed PMS that undergirds bank-based finance is that leverage of collateral is permitted in the former but restricted in the latter. Leverage of collateral allows entities to take trading positions that are multiples of their own capital since collateral need not be acquired with outright cash and can be acquired by issuing repo liabilities against the same collateral. The dealer system, which relies on the ability to leverage collateral and is marginalized by authorities in a deposits-focussed PMS, is central in a repo-focussed PMS. The capacity of dealer and dealer-like entities to make position in securities depends on the prices of the securities and the margins/haircuts imposed on them by market-makers, tying funding liquidity of the entities with market liquidity of collateral in a feedback relationship (CGFS 2014, Brunnermeir and Pedersen 2009). Since price discovery of collateral is crucial, barriers in terms of who can invest in collateral markets and which investment practices (such as short-selling, reuse of collateral) are permitted, are minimal (Claessens et al. 2012). Allowing the prices of collateral to move freely is seen as essential to maintaining the liquidity of collateral (Howell 2016).

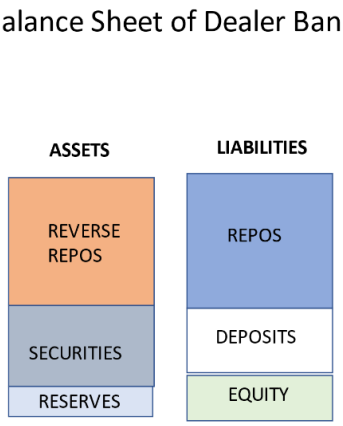
The next section illustrates the balance sheets of the key entities that participate in a repo-focussed PMS, using the U.S. financial system as a template. The key entities are dealer-banks, cash pools, long pools for bilateral repos and clearing banks for tri-party repos (Sissoko 2019).

5.5.1 Dealer-banks

Dealer-banks are commercial banks who also provide market-making services. In market-based finance, the role of dealer-banks in the money market is to facilitate leveraged trading in securities by providing funding liquidity to leveraged investors, which undergirds the market liquidity of collateral (Sissoko 2019). Balance sheets of dealer-banks consists of a higher proportion of securities compared with loans on the assets side and a high proportioner of money-market borrowing compared with deposits on the liabilities side. Dealer-banks stand between cash pools such

as money market mutual funds, corporate treasuries and insurance and pension funds and leveraged investors (long pools) who require cash to fund position such as hedge funds and other dealers (Adrian and Shin. 2010). Fig 14 shows the stylized balance sheet of a dealer bank.

Figure 14: Balance Sheet of a Dealer Bank



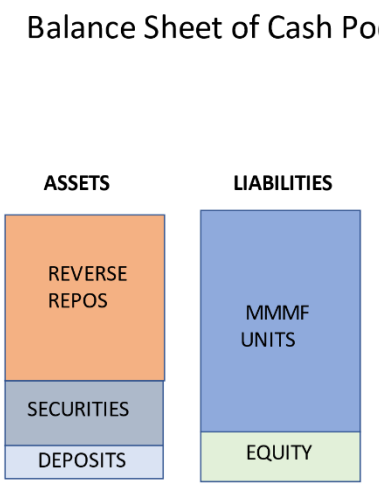
Dealer banks use repos to borrow cash from cash pools and reverse repos to lend cash to long pools. Consequently, their balance sheets consist of a higher proportion of market borrowings (repos) compared to deposits on the liabilities side. While dealer banks intermediate between cash pools and long pools as market-makers, they may also hold some proprietary trading positions in the form of securities. Dealer-banks also provide traditional commercial banking services to borrowers and depositors, although these form a much smaller proportion of their balance sheets.

5.5.2 Cash Pools

Fig 15 shows the stylized balance sheet of a money market mutual fund (MMMF) as an example of a cash-rich investor (cash pool). The liabilities of a MMMF are MMMF units purchased by investors which are redeemable at short notice. Assets consist of a mix of securities, bank deposits and short-term reverse repos, which represent cash lent against collateral. Reverse repos are a safer investment option

for MMMFs than bank deposits as they are collateralized. Wholesale bank deposits, on the other hand, are uninsured since they exceed the deposit insurance ceiling, as well as uncollateralized.

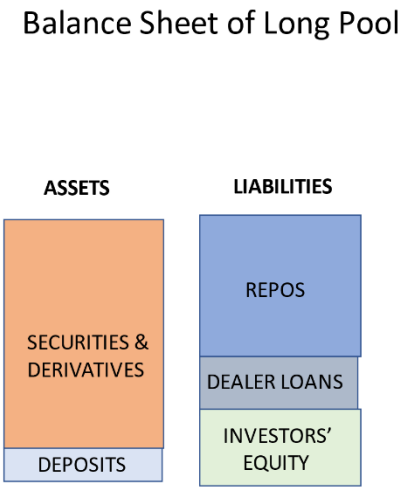
Figure 15 Balance Sheet of Cash pool



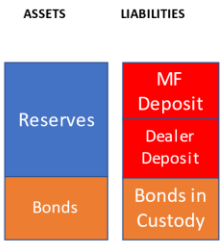
5.5.3 Long Pools

Fig 16 shows the stylized balance sheet of a hedge fund as an example of a long pool, who demand leverage (Pozsar 2014). The hedge funds positions in securities and derivatives through repos, and to a smaller extent through unsecured dealer loans from dealer banks. Repo funding allows hedge funds to build leverage--hold positions in securities and derivatives that are multiples of their equity capital. The amount of securities that hedge funds can fund through repos depends on the market prices of the securities as well as haircut rules imposed by market makers.

Figure 16 Balance Sheet of Long Pool



5.5.4 Clearing Banks



Clearing Banks are custodians of both cash and securities. The above figure shows the stylized balance sheet. On the assets side, it has reserves (cash) and bonds held on behalf of its clients, which is a mutual fund a dealer in the case. Its liabilities

mirror its assets, since it is a custodian and has to produce the cash and securities when requested by clients.

To summarize, cash pools provide funding liquidity to dealer banks through repos. This funding liquidity allows dealer banks to provide market liquidity to collateral. Dealer-banks, which are leveraged entities themselves, provide funding liquidity to the other type of leveraged entities in market-based finance, which are long pools. Provision of funding liquidity by dealer-banks allows long pools to take leveraged positions in collateral. Dealer banks, similar to commercial banks, also provide funding liquidity to loan borrowers and depositors. Clearing banks act as custodians of both cash and securities.

5.6 Working of a Repo-Focussed PMS

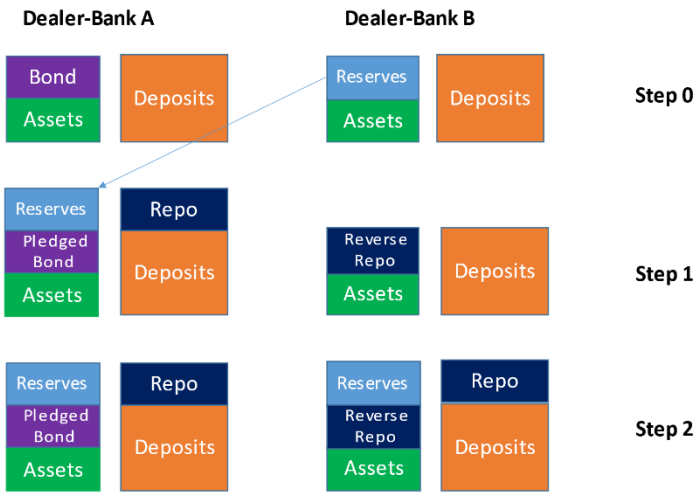
The primary safety features of the money market are the practice of marking collateral to market prices and imposing haircuts on collateral. A fall in collateral prices results in calls by the lender of funds for additional collateral, while a rise in prices results in the lender returning a portion of the collateral (Sissoko 2019). The ability of traders to fund existing positions and acquire new positions depends on the market price of collateral, not on traders own holdings of cash or PMAs. Margin and haircut requirements are left to market participants and are often pro-cyclical—lower when collateral prices are rising, allowing for higher leverage, and higher, when collateral prices are falling, which sharply reduces the amount of leverage (Arian and Shin 2010).

The difference between collateralized borrowing and lending in bank-based finance and market-based finance is collateral can be used to generate leverage in the latter but not in the former (Sissoko 2019). Market-based systems are geared towards enabling leveraged trading of securities. In bank-based finance, a given supply of collateral can be exchanged for a fixed amount of reserves, assuming the price of collateral remains the same. In repo-based finance, a given supply of bonds can be exchanged for a potentially unlimited supply of (shadow) money (Gabor and Vestergaard 2016). This money can be used to fund less liquid but higher-yielding assets (Ibid).

There are two main techniques of position-making using repos. Reusing collateral in bilateral repos, where security received against cash can be re-sold or re-repoed. Reuse of collateral is key feature of classic repos, unlike pledge repos in bank-based finance, where collateral is tied to a specific repo transaction.Tri-party repos are facilitated by clearing banks, which act as custodians of cash and securities. Clearing banks provide intraday credit to dealers/long pools while cash pools provide overnight credit to dealers through reverse repos intermediated by clearing bank.

The two types of position-making using repos are illustrated with the help of balance sheets. Reuse of collateral allows the borrower of the security (lender of cash) selling or repledging the security over the duration of the repo transaction. Reuse increases the supply of collateral during a boom but also drastically reduces it during a crisis. For instance, the supply of high-grade collateral fell by almost $4-5 trillion after the GFC due to reduced rehypothecation (Singh 2011). With reuse, the same asset can simultaneously appear on the books of multiple counterparties as an off-balance sheet entry. The following illustration (Figure 17) gives an example of reuse of collateral

Figure 17. Position-Making by Reusing Collateral in Bilateral Repos

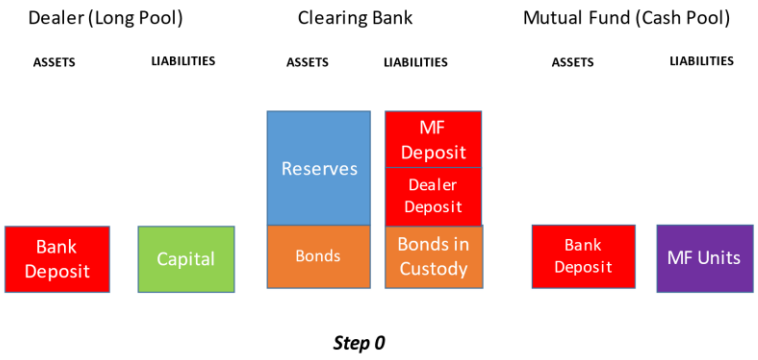


If Dealer Bank A wants to improve its cash position, it can repo bonds out in exchange for reserves with Dealer Bank B. In exchange, it incurs a repo liability and B records a reverse repo asset. This results in an expansion of A's balance sheet (Step 1). However, the fact that B has lost reserves does not mean it cannot take a position of its own if it finds an attractive investment opportunity. It can repledge the collateral that A had pledged with it in exchange for reserves from a third bank (not shown) (Step 2). Those reserves can be used to take a fresh position. Consequently, both Dealer Banks A and B can expand their balance sheets with the same set of collateral.

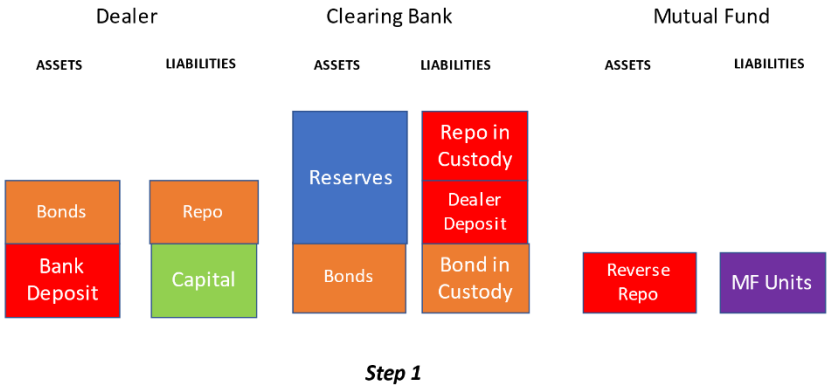
Since balance sheets are interconnected to a large extent due to the reuse of collateral, the entire system rests on the premise that the various counterparties can deliver reserves and collateral when they are required. A delivery failure could lead to a cascade of other delivery failures down the line because of which payments are 'time critical', leaving little room for flexibility or negotiation on deadlines (Marshall and Steigerwald 2013).

The second technique of position-making using repos is the triparty repo structure where a clearing bank intermediates between the lender and the borrower of the cash and the security. Figure 18 illustrates position-making in a tri-party repo structure where a clearing bank stands between a dealer (long pool) and a cash-surplus investor, in this case a mutual fund. It draws on Gabor's (2019) and Sissoko's (2020) description of the repo process.

Figure 18. Position-Making Using Tri-Party Repos



At step 0, the dealer has a bank deposit on the assets side against equity capital. The bank deposit is held with the clearing bank which also holds a deposit in the name of the mutual fund. In addition, the clearing bank holds bonds in custody for a third-party (not shown).



If the dealer decides she wants to acquire the bond in a leveraged transaction rather than by buying the bond with her deposit, the clearing bank transfers the bond that it holds in custody temporarily to the dealer's account (intraday leg not shown to

keep exposition simple). This bond position is funded through an unsecured intraday loan from the clearing bank to the dealer, and the dealer holds the bond for the duration of the trading day (Gabor 2019, Sissoko 2020). If the dealer has not sold or repoed the bond by the end of the day, she must fund it as the clearing bank would not be willing to extend unsecured intraday credit overnight. The dealer repos the bond to the cash-surplus mutual fund, in a transaction intermediated by the clearing bank (Step 1). The clearing bank transfers the bond from the dealer's account to the mutual fund's account for the duration of the repo, which is typically overnight since the dealer would typically want access to the bond during the next trading session. In this manner, the dealer can take a position in a bond without any cash or securities leaving the clearing bank.

5.7 Systemic Risks in Market-Based Finance

Crises in this system are characterized by a collapse in market prices of collateral. The initial decline in prices could be triggered by issuer default which cause a suspension of cash flows from a particular asset, reducing confidence in the asset. To reduce the possibility of issuer default, collateral is assessed and rated by credit rating agencies, which *gives credit rating agencies a great amount of discretionary power*. As issuers of debt pay credit rating agencies for their instruments to be rated, it leads to calls of conflict of interest after the GFC (Mathis et al. 2009, Toscano 2020).

However, the decline in prices could also be triggered by a sudden deterioration in funding conditions, especially for leveraged investors, as was seen during the fall in the prices of U.S. Treasuries in March 2020. The practice of marking collateral to market prices and imposing haircuts on collateral reinforces price movements in either direction, making leverage in market-based finance pro-cyclical (Gabor and Vestergaard 2018, Adrian and Shin 2010).

A fall in collateral prices results in calls by the lender of funds for additional cash or collateral to make up the shortfall, which leads to further selling of collateral. In this way, a collapse in prices of one asset class can spill over into other asset classes as investors are forced to sell assets to meet increased margin requirements. As a result, assets which might not have seen an interruption of cash flows could also see sharp price falls.

5.8 Role of the Central Bank in Market-based Finance

In market-based systems, monetary policy is unbundled from financial supervision (Thomson 1999). In some jurisdictions, such as the UK and the Eurozone pre-GFC, financial supervision was entrusted to a separate government agency, leaving monetary policy as the sole responsibility of the central bank. Consequently, macroprudential regulation is not a feature of market-based systems, as the agency responsible for macroeconomic policy (the central bank) does not have supervisory power over financial institutions and financial regulators are not responsible for macroeconomic conditions. The only avenue for the central bank to express its view on macroeconomic conditions is through its monetary policy. Unlike in bank-based finance, policymakers are not expected to have a view on asset prices and credit conditions in specific sectors. Discretionary supervision of assets by regulators, which is the essence of macroprudential regulation, is ostensibly replaced by "market-based supervision" of assets (Thiemann et al. 2020, Thomson 1999). In addition, prior to the GFC, there was virtually no supervision of the liabilities side of the balance sheets of financial institutions, such as liquidity ratios.

Crises in market-based finance manifest as a "run on repo" rather than a run on bank deposits (Gorton 2012). It is not possible to stabilize the financial system by providing monetary liquidity to banks, because banks are not prepared to provide funding liquidity to the dealer system amid collapsing collateral prices (Mehrling 2012). Consequently, central banks must be prepared to support the prices of collateral used in repos as dealer or market-makers of last resort (Buiter and Sibert 2007, Mehrling 2012, Hauser 2021). Central banks must backstop the market liquidity of collateral by buying, selling and swapping collateral as required, taking significant chunks of collateral markets on to their own balance sheets. The earliest conceptualisations of MMLR held that the central bank must be prepared to support prices of private-sector assets as well as sovereign debt (Buiter and Sibert, 2007). Following the GFC, the U.S. Federal Reserve bought commercial paper, in addition to U.S. Treasurys and mortgage-backed-securities issued by quasi-government entities. However, with the share of private-sector assets used in repos

in the U.S. having fallen since the GFC, the distinction between private-sector and government bonds in central bank purchases has become less important (Pozsar 2015, Sissoko 2019). In other words, the central bank must be prepared to support the market liquidity of collateral used in repo transactions, irrespective of the issuer.

5.9 Conclusion

This chapter showed how deposits-focussed position-making and repo-focussed position-making map on to bank-based finance and market-based finance, respectively. It also illustrated position-making with stylised balance sheets, systemic risks and the role of the central bank in each of the two financial structures. The key features of a deposits-focussed PMS are restrictions on leveraged trading of PMAs and mechanisms for banks to access funding liquidity that do not depend on market liquidity of PMAs. Deposits-focussed PMS maps on to bank-based finance. Banks are the originators of long-term credit in the form of loans, which stay on their balance sheets. Depositors are shielded from losses on loan impairments by deposit insurance and lender of last resort facilities from the central bank. In contrast, long-term credit in market-based finance is extended through securities issued by corporations or in the form of securitised loans. Market-based finance is undergirded by repo-focussed PMS, which facilitates the financing of securities in the money market trough repos. The key feature of a repo-focussed PMS is the ability to leverage collateral. In times of crises, central banks backstop market liquidity of collateral used in repos.

This thesis now turns to the empirical terrain of India. The empirical section consists of four chapters and is narrated from the vantage point of three crises which this thesis argues played a pivotal role in shaping India's liquidity regime. These are the balance of payments crisis of 1991, a securities market scam in 1992 and the Great Financial Crisis (GFC). The first event sparked a shift from a Developmental to a Neoliberal monetary liquidity framework (Chapter 6) while the second led the central bank to double down on a deposits-focussed PMS and bank-based finance (Chapter 7). Chapters 6 and Chapters 7 are the empirical counterparts to theoretical chapters 4 and 5, respectively. Chapters 8 and Chapter

9 focus on the period after the GFC. Chapters 8 narrates the entrenchment of the Neoliberal monetary liquidity framework, and the intensification of external dominance of monetary policy that it implies, due to capital account liberalisation in the age of Quantitative Easing. Chapter 9 chronicles the rise of non-bank lending without market-based finance due to the unwillingness of the Indian central bank to carry out the institutional changes required to facilitate leverage trading of collateral in the money market and to support credit creation outside the banking sector.

Chapter 6 After the BoP Crisis: Goodbye Fiscal Dominance, Hello Global Dominance?

In the economic history of independent India, no single event looms larger than the balance of payments (BoP) crisis of 1991. The crisis was the trigger for deep structural reforms spanning industry, finance, trade and tax policy, which came to be described in the media by the moniker, LPG, or Liberalisation, Privatisation and Globalisation (Rajendran and Natarajan 2010). The reforms transformed India to an extent that economic narratives, including the RBI's official history, refer to a "pre-reforms" phase and a "post-reforms" phase, marking the reforms as a watershed moment for the country (see Joshi and Little (1999) for a summary of the reforms). The popular perception of the reforms is that they permanently lifted the economy to a higher growth trajectory and that they were "home-grown" i.e. designed by Indian policymakers, not dictated by the IMF or the World Bank[16] (Mukherji 2008, Ahluwalia 2002).

The backdrop to the crisis[17] was an increase in India's current account deficit amid a spike in oil prices, a fall in exports growth amid a global downturn, and nervousness about political instability in the country (Cerra and Saxena 2002). Foreign-currency loans to fill the trade deficit became harder to obtain following a sovereign rating downgrade at the beginning of 1991, which also sparked outflows from deposits of non-resident Indians (NRIs). At the peak of the crisis in June 1991, India had enough foreign exchange reserves to cover less than three-weeks-

[16] Unlike the economics literature, the political science literature is more sceptical of the role of reforms in India's growth (Kohli 2006, Dutt 1997, Sharma 2009). This literature views the reforms as half-hearted and sporadic as they did not include politically difficult reforms such as land redistribution, changes in labour laws, removal of subsidies, privatization of state-run banks, etc. Kohli (2006) argues that India's rapid economic expansion was a result of the government, led by the then prime minister Indira Gandhi, turning explicitly pro-business from the 1980s onwards and expressing a willingness to discipline labour unions, which were a powerful political force in the Indian economy till the 1980s. On the second perception, Sengupta (2009) argues that the World Bank office in India played a significant role in tipping the balance in favour of "free-market reformers" among Indian policymakers, who won out against the "selective liberalizers".

[17] Some authors such as Patnaik and Chandrashekhar (1995) contest the description of this event as a "crisis", noting that it was not accompanied by runaway inflation, company bankruptcies or a collapse of economic growth. They contend that the 'crisis' framing was an exaggeration, adopted to push through unpopular structural adjustment reforms.

worth of imports (Ahluwalia 2019). In the following month, the RBI secretly transferred 47 tonnes of gold to the vaults of Bank of England as collateral for a loan of $405 million. Because of the cultural significance of gold in India, there was a public outcry after a newspaper broke news of the loan, forcing the government to defend its actions in Parliament. The pledge of gold was seen as a moment of abject national humiliation, becoming the event that the crisis is remembered by in the popular imagination.

The BoP crisis itself was resolved relatively quickly, through a standby agreement with the IMF and foreign-currency bond issuances to overseas Indians, as well as a "classic stabilization program" consisting of currency devaluation and reduction of the fiscal deficit as a prelude to deeper structural reforms (Ahluwalia 2019, p. 47). There was a consensus among the architects of the reforms that the high fiscal deficit was the primary cause of the macroeconomic imbalances that had precipitated the BoP crisis (Joshi and Little 1994). Large deficits financed by the central bank were seen as being inflationary as well as contributing to high current deficits. One of the first steps of the reformers was to start the process of dismantling the debt monetisation regime that had enabled the government to run up high deficits. At the same time, India started gradually liberalizing capital inflows and moving from a fixed exchange rate to a managed float.

This chapter interprets these policy changes through the lens of the monetary liquidity framework, which is Pillar 1 of the liquidity regime introduced in Chapters 3 and 4. A monetary liquidity framework is a macro-financial regime that links the key actors involved in reserves production in a specific configuration. It includes the monetary-fiscal nexus, exchange rate policy and capital account policy. Following the BoP crisis, India moved from a Developmental ML framework featuring deficit monetisation-capital controls-fixed exchange rate (DM-CC-FX) to an Neoliberal framework characterised by inflation targeting-capital account liberalisation-managed float (IT-KAL-MF).

Chapter 5 showed how due to the settlement dynamics of cross-border flows, all FX inflows are financed by the creation of local banks deposits, resulting in the creation of new spending power in the local economy. Since central banks aim to influence monetary conditions by influencing the creation of new liabilities (mainly bank deposits) in the economy, FX inflows potentially reduce monetary policy autonomy. Through balance sheet analysis, Chapter 5 showed how the Neoliberal ML framework replaces deficit monetisation with FX monetisation as the principle source of monetary liquidity. This chapter applies that framework to chronicle the rise of the Neoliberal monetary liquidity framework in India. In doing so, it builds on the work of early critics of Indian reforms, such as Pattnaik and Chandrashekhar (1995, p. 3009), who argued that India's structural reforms were driven by a logic of 'globalisation of finance' rather than 'globalisation of production' as they attracted "hot money" rather than long-term foreign capital for productive investment.

This chapter shows how the Indian central bank's leadership prior to the Great Financial Crisis (GFC) was not unmindful of the risks of a loss of control over monetary liquidity due to capital account liberalisation. However, the RBI viewed it as the lesser, and more manageable evil, compared to deficit monetisation, which it attacked with zeal. The RBI believed that capital inflows into local-currency assets, which do not cause currency mismatches on the balance sheets of local non-bank firms, were benign, and could be managed through a combination of sterilisation and macroprudential regulation. However, this framing of capital flows made it difficult for the RBI to resist calls from the government and the private sector to liberalize inflows into local-currency assets, setting the stage for destabilizing inflows and outflows during the GFC. In its enthusiasm to end fiscal dominance of monetary policy, the RBI laid the ground for global dominance of monetary policy, which left it with less control than it had anticipated over credit conditions in the economy.

This chapter starts with elaborating the Developmental framework that existed prior to the BoP crisis, highlighting the negligible role of FX purchases in mechanisms of reserves creation at the time. The next sections chronicle the

development of the Neoliberal framework by examining the evolution of each leg of IT-KAL-MF individually. Measures to stabilize the Neoliberal framework, such as sterilisation and macroprudential regulation, are examined next. The last section explains how the RBI's policy actions tied credit conditions in the Indian economy to the global financial cycle.

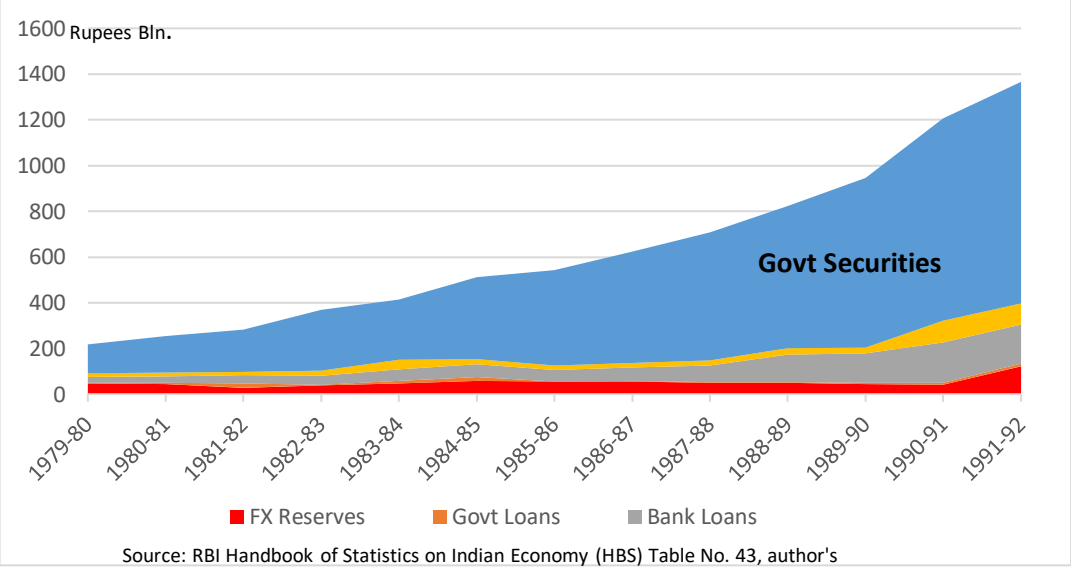
6.1 The Developmental Monetary Liquidity Framework

India's Developmental monetary liquidity framework prior to the BoP crisis was characterised by deficit monetisation-capital controls-fixed exchange rate. This section elaborates each leg of the framework in turn.

6.1.1 Deficit Monetisation (DM)

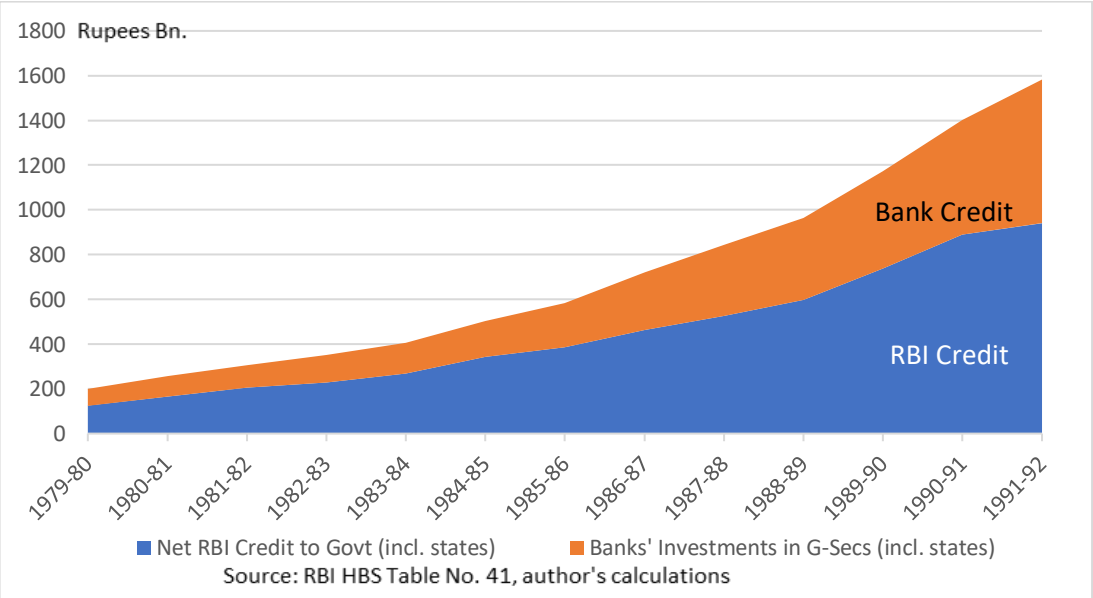
Deficit monetisation involves the central bank extending credit to the government either through uncollateralised loans or by buying newly issued government bonds, as explained in chapter 5. When the government spends its balances with the central bank, it results in the creation of new reserves and bank deposits. Prior to the BoP crisis, so-called *adhoc* Treasury bills were the primary instrument through which deficits were monetised. Ad-hoc T-bills were bills issued by the government when it needed funds and sold to the RBI. The interest rate on T-bills was unchanged at 4.6% from 1974 onwards till their issuance was reduced from 1994 onwards and ultimately stopped in 1997. The coupon was below interbank interest rates during the period, which were capped at 10% (Vaghul 1987). While the RBI sold some of the bills to banks, banks which bought the bills to meet their statutory liquidity ratio (SLR) requirements, often rediscounted them quickly at the RBI, because of which the central bank was by far the largest owner of T-bills (Chakravarty 1985).

Figure 19 Composition of RBI Assets Pre-BoP Crisis



During the 1980s, the proportion of government securities on the assets side of the RBI's balance sheet grew sharply (see Figure 19). By 1990, government securities accounted for about two-thirds of the RBI's assets. Banks were required to hold about 40% of their assets in government securities as part of the Statutory Liquidity Ratio (SLR). Despite this requirement, the RBI's holding of government securities exceeded that of banks at the beginning of the 1980s (see Figure 20). By the time of the balance of payments crisis, the gap between bank credit and RBI credit to government grew to almost twofold.

Figure 20 RBI, Banks Credit to Govt



The RBI was a reluctant participant of the deficit monetisation regime, and during the 1980s, its trepidation increased. An influential committee set up by the RBI in the heyday of monetarism in the early 1980s to assess the working of the Indian monetary system was extremely critical of deficit monetisation (Committee to Review Working of the Monetary Systems: Chair: Sukhamoy Chakravarty). Its report, which was released 1985, recommended that the definition of budgetary deficit be widened to include RBI credit to the government, and that flexible money supply targets be introduced by mutual agreement of the RBI and the government to prevent excessive deficit monetisation. The recommendations echoed the influential doctrine of money supply targeting advocated by Friedman (1960), and the government accepted them in principle. However, the mid-to-late 1980s were characterized by political instability and frequent changes of leadership of the Finance Ministry, which made it difficult for the RBI to impose fiscal discipline (see RBI (2013a), chapters 3 and 4). Between 1985 and the BoP crisis in 1991, India saw six different finance ministers. The period was characterized by a tug-of-war between successive governments and the RBI over the level of the fiscal deficit. The RBI became increasingly strident in its opposition to deficit monetisation. In a letter to the finance minister in 1989, the RBI governor complained that what "started off as a mechanism for providing temporary accommodation to the Central Government to enable it to maintain a minimum balance with the Reserve Bank became an open-ended monetisation of budgetary deficits" (RBI 2013a, p. 67).

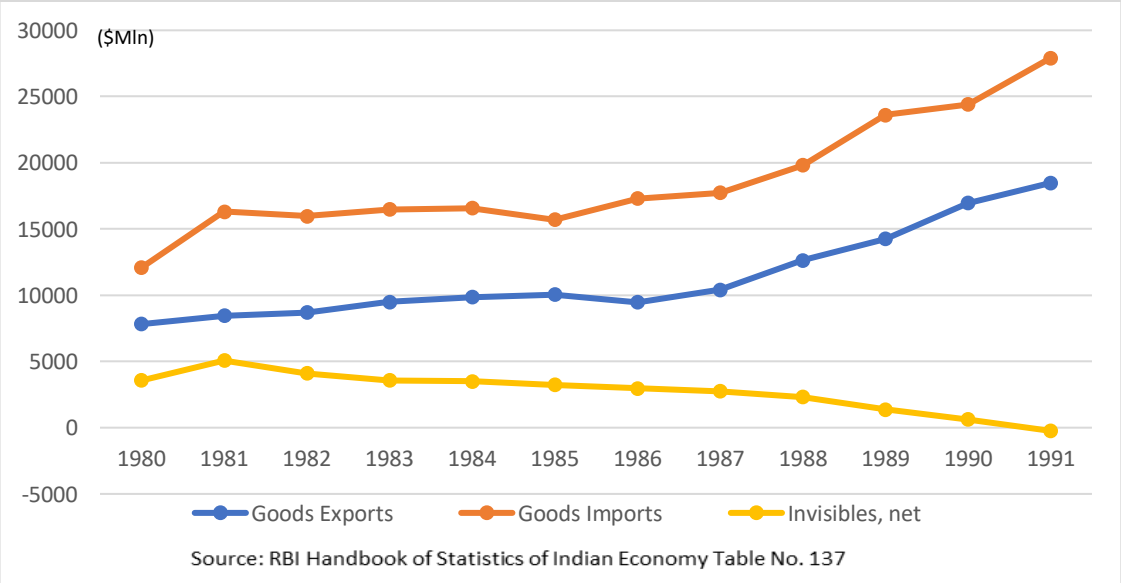
Apart from deficit monetisation, the other source of reserves creation was uncollateralized RBI refinance to banks (represented as bank loans in Figure 19). Banks had access to four RBI refinance facilities: export credit, standby, discretionary and against the collateral of 182-days T-bills. Of these, export credit finance was, by far, the largest facility. The RBI would frequently change the borrowing limits of its refinance facilities to rein in credit creation. However, RBI refinance to banks accounted for a much smaller proportion of assets on the RBI's balance sheet compared to its holdings of government debt (see figure 19).

The RBI also changed the cash reserves ratio to sequester or release reserves. During the 1980s, the CRR was increased at regular intervals as the RBI sought to mop up reserves created by deficit monetisation. The reserves ratio was at 15% at the time of the BoP crisis, compared to 6.5% a decade earlier.

6.1.2 Capital and Import Controls (CC)

For the first few decades after achieving independence in 1947, imports, especially those of consumption goods, were strictly controlled as India followed a development strategy of import-substituting industrialization. Apart from import controls, other features of India's development strategy were industrial licensing, administered interest rates and state ownership of heavy industry (Cerra and Saxena 2002). While this strategy had started coming under strain from the mid-1960s with manufacturing output stagnating, imports were liberalized substantially only in the 1980s, ostensibly to boost export capacity (Chandrasekhar 2010). Both imports and exports rose through the 1980s (see Figure 21), although imports grew at a faster clip in the second half of the decade, widening the trade gap. However, invisibles, comprising mainly services exports and remittances from Indians working overseas, dropped steadily through the decade, pushing the current account balance steeply in the negative.

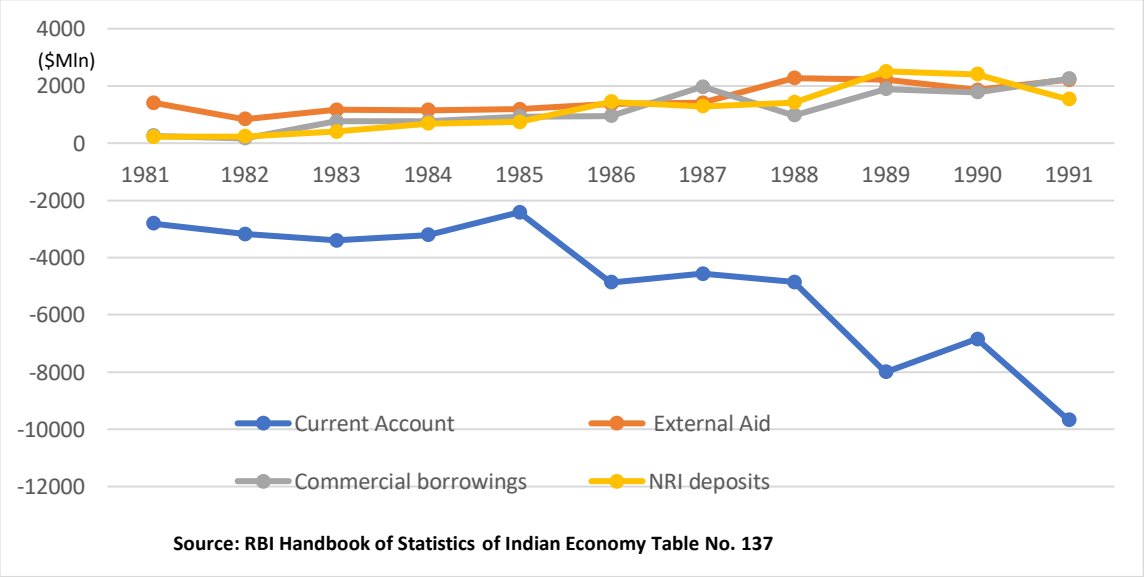
Figure 21 India Pre-Bop Crisis Current Account



Source: RBI Handbook of Statistics of Indian Economy Table No. 137

India maintained a "least-developed-country-style" capital account during the pre-crisis phase (Shah and Pattnaik 2005). For most of the period prior to the 1990s, the capital account was closed except for aid flows and external borrowing from banks to fund the current account deficit. From the mid-1970s onwards, the RBI allowed Indian banks to accept deposits from non-resident Indians (NRIs). In 1982, banks were permitted to offer NRI deposits at interest rates higher than

Figure 22 India Pre-Crisis Balance of Payments



Source: RBI Handbook of Statistics of Indian Economy Table No. 137

those on onshore local-currency deposits (RBI 2013a, p. 203). The exchange rate risk on NRI deposits denominated in foreign currencies was borne by the RBI, and by the mid-1980s NRI deposits had become a significant source of external funding (see figure 22). However, the combination of aid flows, external borrowing and NRI deposits were not enough to fill the current account gap, and FX reserves steadily fell through the decade. By March 1991, foreign currency assets had fallen to $2.24 billion from $5.9 billion a decade ago.

6.1.3 Fixed Exchange Rate

On the exchange rate front, the rupee was de-pegged from the pound sterling in 1975 and was pegged to a basket of currencies of major trading partners as a managed float (Sodhani Committee, p. 40). Through the 1980s, the RBI followed a policy of gradual depreciation of the real exchange rate (RBI 2013a, p. 230). Exchange rate transactions could only take place within the daily rupee-sterling price band specified by the RBI. The RBI purchased four currencies (Sterling, Dollar, Yen, Deutsche Mark) from banks to allow export earnings to be remitted smoothly, but only sold the pound-sterling. Foreign exchange denominated in the four currencies that could not be sold in the interbank market during the day was required to be sold to the RBI along with a declaration that they had been purchased for commercial transactions. Banks were required to cover all open positions by the end of the trading day.

To summarize, the Developmental framework represented fiscal dominance of monetary policy. Automatic purchases of government securities and RBI refinance were the principal tool for creating monetary liquidity. The RBI would change the CRR or refinance limits to implement monetary policy. FX assets made up a small proportion of assts on the RBI's balance sheet, which was dominated by government debt.

6.2 After the BoP Crisis: Building the Neoliberal Monetary Liquidity Framework

Most narratives about India's programme of economic reforms distinguish between the immediate stabilization measures and longer-term reforms. According to the RBI, the former consisted of "fiscal correction, monetary tightening, inflation control, exchange rate adjustment and strengthening the competitiveness of India's exports. These were supported by longer-term structural reforms, such as industrial deregulation, liberalisation of foreign direct investment (FDI), overhauling of public sector enterprises and financial sector reforms" (RBI 2013a, p. 559). The stabilization measures resulted in the formation of the Neoliberal Framework characterised by IT-KAL-MF which institutionalized global

dominance of monetary liquidity framework following the BoP crisis. This section examines the development of each leg of the framework.

6.2.1 The IT Leg: Ending Fiscal Dominance

In the 1990s, the IMF-WB and global financial institutions pushed DECs to end "seignorage" or deficit monetisation, build liquid debt markets and strengthen banking systems to enable them to adopt inflation targeting (Debelle at Al. 1998, Mehrotra et al. 2013).[18] The RBI took this advice to heart--one of its first steps of the RBI following the BoP crisis was to start the process of taking apart the deficit monetisation regime. This process involved convincing the government to agree to new rules on monetisation of deficits and setting up a market for government securities almost from scratch. The RBI auctioned dated government securities for the first time in December 1992 (Mohan 2007). In 1994, the RBI and the Indian government entered into a supplemental agreement to wind down the issuance of ad hoc T-bills and end it completely by 1997 (See Table 4 for timeline of measures). Ad hoc T-bills were replaced by a Ways and Means facility, which extended credit to the government for a fixed duration and at higher interest rates. The attack on deficit monetisation culminated with the passage of the Fiscal Responsibility and Budget Management Act 2004, which barred automatic monetisation of the deficit by the RBI and imposed revenue deficits targets on the government. Similarly, the SLR was reduced in steps from 38.5% to 31.5% starting from 1992 until 1997, when it was cut in a single swoop to 25% to allow banks more discretion in how to deploy their funds (Reuters News 2010).

[18] This thesis does not engage with the question of monetary policy rules of the inflation-targeting framework. Instead, it focusses on the reconfiguration of mechanisms of public debt management that allowed inflation targeting to be implemented. For critiques of inflation targeting and its suitability for India, see Azad (2016)

Table 4 Timeline of Death of Deficit Monetisation

Date	Policy Change
June 1992	G-secs auctioned at market-determined rates for first time
January 1993	91-day T-bills auctioned at market-determined rates for first time
August 1994	Agreement between RBI and Govt to limit issuance of ad-hoc T-bills
March 1995	Guidelines for enlistment of Primary Dealers Issued
March 1997	Agreement between the RBI and Govt to end issuance of ad-hoc T-bills; replaced with "Ways and Means" overdraft facility
April 1997	(Pledge) Repo permitted in G-secs for banks and PDs
July 1997	Foreign institutional investors permitted to invest in G-secs
June 2000	Introduction of Liquidity Adjustment Facility—short-term loans/borrowing against G-secs as primary liquidity management tool of RBI
August 2003	Fiscal Responsibility and Budget Management Act passed barring RBI from primary G-sec market, requiring government to bridge revenue deficit by 2008

Source: Mohan (2007)

The RBI was clear that the reforms would not end debt monetisation completely. However, debt monetisation in the future would be on terms set by the RBI, not the government.

> The exit of the Reserve Bank from the primary market does not prohibit participation of the Reserve Bank in the secondary market and does not eliminate monetisation; however, the scope for private placement of debt or devolvement of auctions of public debt on the Reserve Bank is eliminated. Thus, the extent of monetisation and terms of such monetisation would depend on the judgement of the Reserve Bank in regard to overall stability. Such operational freedom is essential to assure the system that conduct of monetary policy balances the three relevant

> elements, viz., the fiscal needs of government, the compulsion of a deregulated interest rate regime and requirements of a more open external sector (RBI 2001a, Chpt 7.41)

The RBI, however, did not lean too heavily on the government as it recognized the importance of orderly G-sec markets for macrofinancial stability. Its strategy was to coax the government to reduce its fiscal deficit, but to, eventually, accommodate the government's borrowing programme. It did not try to arm-twist the government into reducing the fiscal deficit by, for instance, allowing yields on government bonds to rise.

> Once a final decision is taken on the fiscal deficit by the government, Reserve Bank's endeavour is to ensure that it is financed in a way that is least disruptive to the macro economic stability, and is conducive to growth. In fact, exercise of monetary policy without sensitivity to the reality of fiscal dominance will be counterproductive (Reddy 2000).

During the 1990s, the RBI adopted the discourse of inflation targeting chiefly to push for the end of deficit monetisation, arguing that if fiscal dominance of monetary policy ended, the RBI would regain control of its own balance sheet. It could then focus its monetary policy on controlling inflation. However, the RBI was not in favour of firm targets for inflation or any other macroeconomic variable. For one, it was aware of its lack of success with money-supply targeting and was not optimistic about its chances with targeting any other macroeconomic variable, including short-term interest rates (RBI Official No. 1). Two, committing to a policy target would have reduced its discretionary power over monetary policy. In 1997, it moved away from "monetary targeting with feedback" towards a more eclectic "multiple-indicator" approach that permitted the RBI substantial discretion in setting monetary policy without committing to target a particular macroeconomic variable. The story of how the "multiple indicator" approach came to be adopted was narrated to me by a former RBI official.

> We were at that time (around 1997) asked by one of the multilateral institutions to make a survey of monetary policy issues. So, they wanted to know what is the monetary policy framework…So (the RBI's)

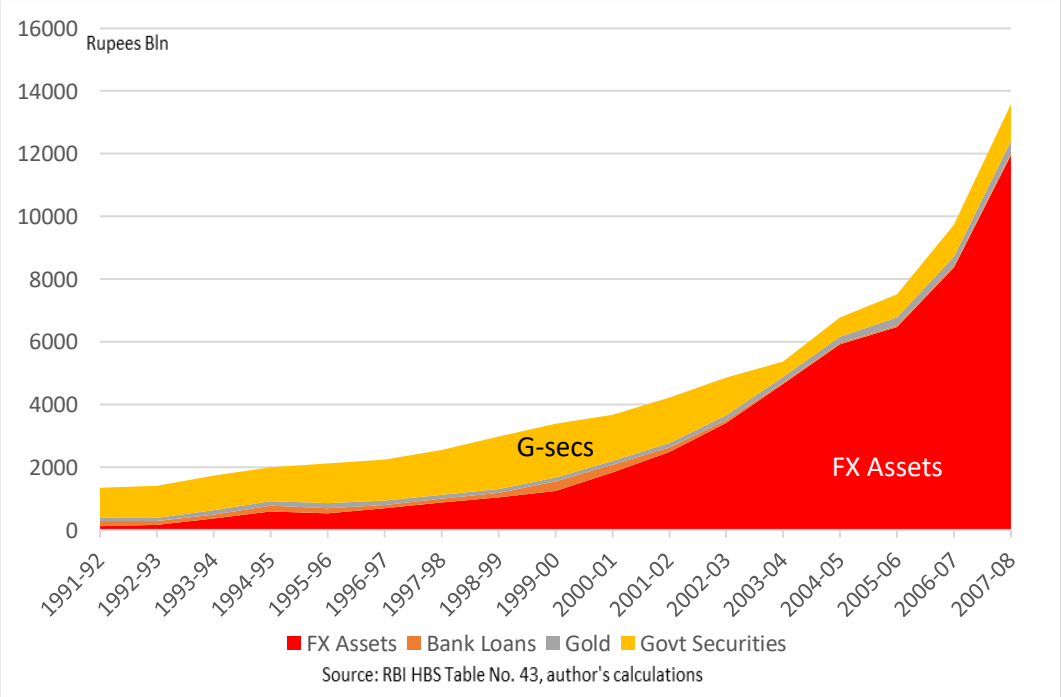
> monetary policy head came to me and asked me what should I do. So, with some knowledge of what was happening in the boards of the IMF where I used to be a participant as an observer or representative of the Indian chair, I remembered two words "multiple indicators" from one of the advanced country representatives, and I thought why can't we do this? … So, I suggested to (RBI Deputy Governor) Reddy that we call it the multiple indicator approach. Reddy accepted it because we not only look at government finances, we also look at the way in which the foreign sector is developing in the country, and, of course, what are the kinds of demands for credit. (RBI Governor) Jalan simply loved it, and said "We have got the freedom, the discretion is ours"... So, we adopted it, and thought let's not call it a particular targeting approach because we couldn't have targeted interest rate, we couldn't have targeted exchange rate, we couldn't have targeted money supply proper, so we thought this is the ideal thing. There is no theoretical framework in this. I understand that one might argue it out that there is nothing like a theory there and no assumptions given, nothing of that sort. (RBI Official No. 1)

In other words, the RBI adopted parts of the ideological discourse of inflation targeting that suited its own goal of ending deficit monetisation. However, it refused to adopt a formal inflation target that could have reduced its discretionary power over setting monetary policy. Another aspect in which the RBI deviated from the prescriptions of inflation targeting was on the question of divesting the central bank from the responsibility of managing sovereign bond issuances. Before the GFC, the policy consensus was strongly in favour of separating sovereign debt management from the monetary policy function so that central banks could focus on controlling inflation without having to worry about the government's cost of borrowing. The separation was seen as being even more important in the case of DEC central banks, as they were considered more susceptible to political interference than their counterparts in advanced economies (Singh 2015). It was argued that

entrusting sovereign debt management to an independent agency would improve confidence among international investors and reduce volatility of capital flows to DECs (Cassard and Folkerts-Landau 1997). Nearly every Indian official committee which examined the issue from the late 1990s onwards recommended that the RBI be divested from the responsibility of managing sovereign debt issuance (see Singh (2015) for a summary). However, successive RBI governors argued that having the RBI manage sovereign debt issuance was essential for financial stability, and the committees' recommendation went unheeded (Reddy 2017).

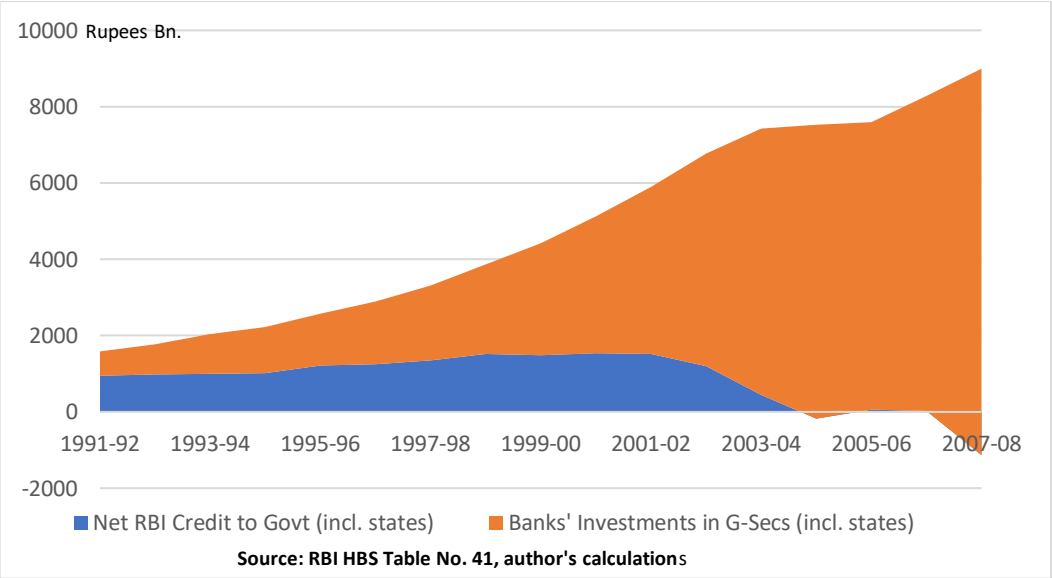
Following the 1991 crisis, government securities initially remained the biggest component on the RBI's balance sheet, partly because the RBI converted non-marketable debt into government securities. The proportion of FX assets on the RBI's balance sheets grew steadily until 2000, and surged thereafter as capital inflows picked up (see Figure 23). By 2008, FX purchases had become, by far, the biggest source of monetary liquidity in the banking system, similar to DECs with open capital accounts.

Figure 23 Composition of RBI Assets Post BoP Crisis



Another consequence of the reforms was commercial banks supplanted the RBI as the biggest creditors to the government (Figure 24). In some year prior to the GFC, net RBI credit to the government was negative as the central bank sold government bonds as part of its operations to sterilize capital inflows. Commercial banks' investment in government securities more than doubled between 2000 and 2010. A portion of the increase was due to issuance of sterilization bonds by the government.

Figure 24 RBI, Banks Credit to Govt Post-BoP Crisis



Source: RBI HBS Table No. 41, author's calculations

As banks' holdings of government securities increased, the RBI began to develop pledge repos with government securities as collateral as a monetary policy instrument. The RBI began to absorb surplus reserves from banks through reverse repo operations at variable interest rates in 1992 (RBI 2011). At first, the repos were only used to absorb funds from the market, but in 1995 the RBI began using repos to infuse funds by allowing two RBI-sponsored market makers in government securities, Securities Trading Corporation of India (STCI) and Discount and Finance house of India (DHFI) to borrow funds from it using repos. In 1997, a programme that allowed that allowed banks to directly borrow from the RBI through pledge repos using government securities was introduced. At the same time, the RBI

began to limit its standing facilities for reserve injection, which were the General Refinance facility and Export Credit Refinance facility, in favour of the new pledge repo facility, which came to be known as the Liquidity Adjustment Facility. The Liquidity Adjustment Facility remained the principal monetary policy instrument of the RBI till the mid-2010s when the RBI began to rely more on outright salea and purchases of securities, known as open market operations (OMOs).

6.2.2 The KAL Leg: A Hierarchy of Flows

In 1991, an influential committee chaired by a future governor of the RBI set out a blueprint for balance of payments policy: a market-determined exchange rate, removal of trade barriers, current account convertibility and gradual capital account liberalisation (Mohan 2008). On the issue of capital account liberalization, it recommended a preference for equity flows, especially Foreign Direct Investment, which refers to acquisition of stakes of more than 10% in local companies by foreign multinational companies, over debt flows; strict controls on overseas borrowing by companies, especially short-term debt; disincentivizing volatile flows into NRI deposits and a gradual relaxation of restrictions on outflows. In 1997, another committee listed a set of pre-conditions for full capital account convertibility: a reduction of the fiscal deficit, low inflation and a strong banking system (RBI 1997).

The memoirs of a former RBI Governor spell out this policy in succinct detail:

> The pillars of the framework are: full convertibility on current account coupled with effective management of capital flows directed to ensure a realistic exchange rate and a current account deficit that can be financed by normal capital flows. This framework was a pioneer in indicating the importance of vulnerability due to short-term liabilities in the external sector. This was also a pioneer in suggesting a hierarchy among different types of capital flows in terms of stability. To illustrate, in view of the larger share of external liabilities, the framework was in

> favour of non-debt flows... The global crisis has further reinforced the relevance of this framework. (Reddy 2017, p. 2397)

India's policies were in line with the blueprint for capital account liberalization adopted by Asian DECs after the Asian crises of the 1990s. A key lesson drawn from the Asian crises was that currency and maturity mismatches in borrowing were to be avoided as they made DECs vulnerable to capital outflows (Hoffman et al. 2021). Indian policymakers instituted a hierarchy of FX inflows, with FX inflows into local-currency assets preferred over foreign-currency loans or bond issuances which caused currency mismatches on local balance sheets. At the top of the hierarchy was FDI followed by foreign portfolio investment in equities. Foreign portfolio investors (FPIs) were first allowed to invest in Indian equities in September 1992, within a ceiling of 24% of a firm's paid-up capital and with no one FPI owning more than 5%. These limits were progressively eased over the following years and by 2001, FPIs could own as many shares as permitted by the government's sectoral FDI rules (see Appendix A.1 for timeline of capital account liberalization after the BoP crisis). On the other hand, the limit for aggregate FPI investment in government debt remained unchanged at $1 billion from April 1998 to November 2004.

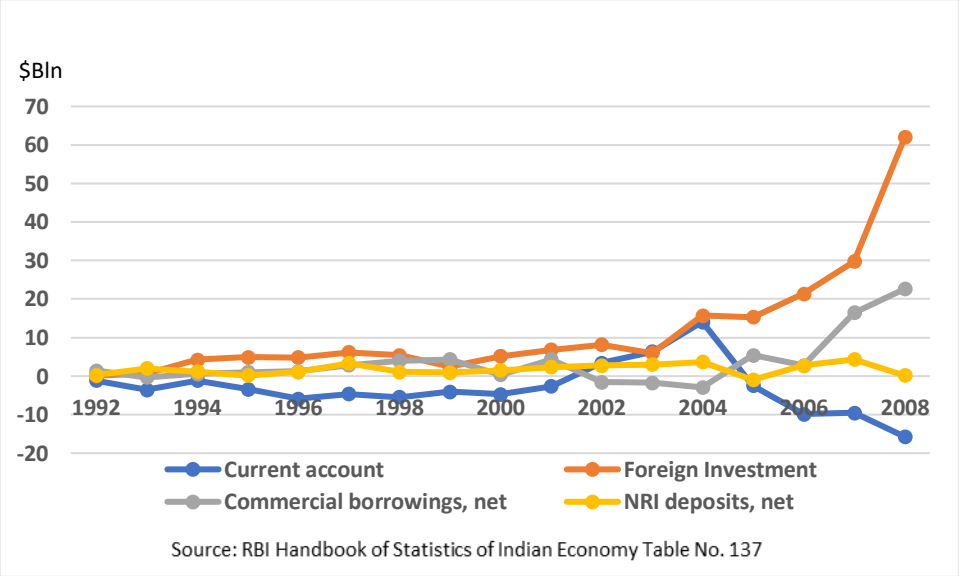
Foreign portfolio investment in corporate debt was discouraged till the mid-2000s. FX inflows funded by FX liabilities, such as foreign-currency loans by Indian non-bank firms, were strictly regulated till the early 2000s. In conjunction with the capital account rules, currency market regulations were configured to prevent carry trading and short-selling of the rupee (see next section). Dollarisation, which entails allowing residents to issue FX liabilities freely and also hold FX assets onshore was never considered (Reddy 1998a). Neither was internationalisation, which allows entities to issue local-currency liabilities offshore.

While portfolio inflows were liberalized progressively, borrowings limits on foreign-currency bank loans were tightened or relaxed depending on currency market conditions. The RBI was wary of Indian entities borrowing at low interest rates from abroad and lending at higher interest rates at home as this increased currency mismatches (local-currency assets financed with foreign-currency

liabilities). To discourage this carry trade, foreign-currency bank loans had strict end-use restrictions.

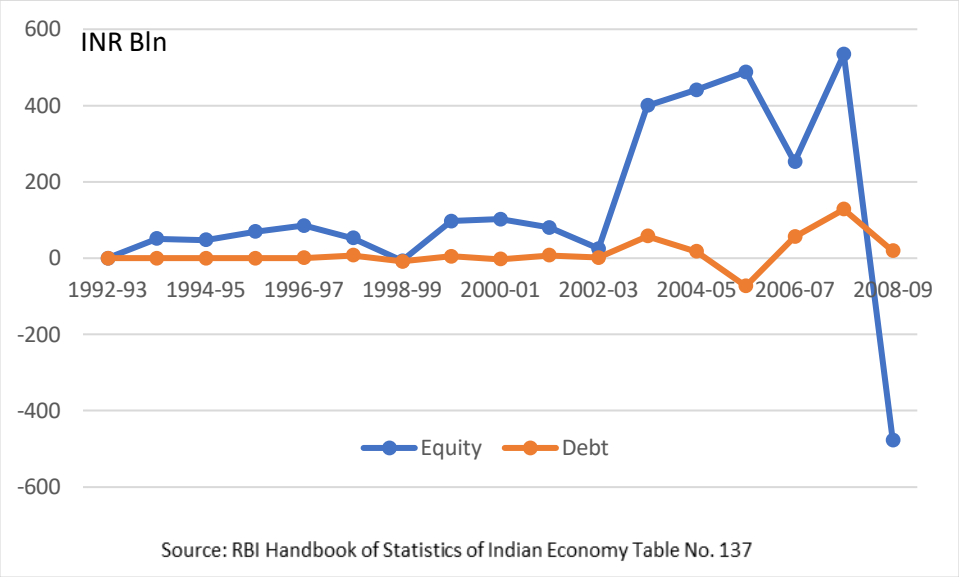
India's balance of payments picture changed dramatically post the BoP crisis, with a sharp uptick in foreign portfolio investment and commercial borrowing from the early-2000s onwards as restrictions were eased. In the run-up to the global financial crisis, foreign portfolio investment alone was enough to fill the current account gap many times over (see Figure 25).

Figure 25 Post-BoP Crisis Balance of Payments



India was unusual among DECs in that equity inflows were dominated by portfolio inflows from institutional investors rather than foreign direct investment (Shah and Pattnaik 2005). Although the RBI initially favoured equity flows over debt flows, it began to ease restrictions on debt inflows from the mid-2000s (see Figure 26).

Figure 26 Post-BoP-Crisis Portfolio Inflows



Source: RBI Handbook of Statistics of Indian Economy Table No. 137

6.2.3 The MF Leg: FX Intervention And FX Trading Restrictions

After the two-step devaluation of the rupee in July 1991, India moved to a dual exchange rate system in March 1992. Under the system, exporters were required to sell 40% of FX earnings to the RBI at the official rate while the remainder could be sold at the market rate. The dual rate system ended in March 1993, ahead of India achieving current account convertibility in August 1994 by accepting Article VIII of the Articles of agreement of the IMF (RBI 2004). Since then, the RBI has maintained that it does not target a specific level of the exchange rate, only intervening in the FX market to curb volatility. However, exchange-rate stability was a primary concern of the RBI.

> Normally, the principle is you keep the USDINR (dollar rupee) separate. So, the consequences of that have to be borne by the rest of the market. So, that in some sense is the most sacrosanct kind of thing. And, you manage, the rest of it through the other markets, and that is how it (the RBI) operates. (RBI Official No. 4)

In the absence of an official exchange rate policy and as the RBI is a governor-centric institution, RBI interventions in the FX market depended on the preferences of the incumbent governor, and implicit pressure from the government. Y.V. Reddy, who was governor from 2003-2008, said he used a rule

of thumb centred around the Real Effective Exchange Rate—any deviation of more than 10% from the REER resulted in FX intervention. Since 1997, the RBI has purchased a net $301 billion on the spot market and a net $10.5 billion on the forwards market.

Currency market regulation was based on the principle that "if you don't have foreign exposure you have to keep away from the forex market" (RBI Official No. 5). Capital controls and currency market regulations were configured to restrict short-selling and carry trading by residents, even as capital account liberalisation encouraged carry trading by non-residents (Shah and Pattnaik 2005). Local companies were restricted from carry trading by regulations on the quantum, cost, maturity and end-use of foreign-currency loans. Local banks faced restrictions on overnight open positions and currency mismatch limits. While these limits where progressively eased and banks were given more discretion in setting their own limits, the RBI often exerted moral suasion on banks through informal channels during periods of rupee volatility[19] (RBI Official No. 4). Non-bank participants in derivatives markets were required to show proof of an underlying current- or capital account exposure.

> The entire gamut of regulations on hedging of currency exposures is predicated on the fact that the entity accessing the forex market should have an underlying. (RBI 2005a, p. 32)

Non-residents initially faced strict limits on investment in local-currency debt even as restrictions on equity investment were liberalized rapidly. In addition, non-residents faced restriction on borrowing in rupees to prevent short-selling of the rupee. Indian exporters also faced limits on their holdings of foreign currency, which were tweaked in response to currency market conditions to regulate the supply of foreign exchange.

[19] A former executive with a foreign bank narrated this example of the RBI exerting moral suasion: "I remember by chief dealer, my boss, getting a call from [name redacted] at the RBI. So, he asked, what's your position? My boss said I am dollars long. So, he said, I am calling you as a friend. IN 10 minutes, I am going to call you as RBI and when I call you, you should tell me your position is 0. Not 0.5, 0. So, obviously, we had to sell".

6.3 Stabilizing the Neoliberal Framework: Sterilization and Macro-Prudential Regulation

The RBI was mindful of the risk of loss of control on monetary liquidity as it adopted the Neoliberal framework. However, it believed it could reassert control over monetary liquidity through sterilization, and insulate the economy from the effects of any excess reserve creation through macroprudential regulation.

6.3.1 Sterilization

The RBI argued that unsterilized FX intervention could lead to "asset price volatility, imprudent lending and adverse selection" (RBI 2003, p. 4). Sterilization would presumably keep narrow money and the money supply constant, counteracting the expansionary effects of capital inflows. The drawbacks of sterilization were the fiscal costs to the government or the central bank of servicing additional debt and higher interest rates that would attract more capital inflows from carry-trade investors (Christensen 2004, Gabor 2010).

As the infrastructure for the government securities market was not well-developed in the 1990s, the RBI could not rely solely on market-based sterilisation tools such as repos and OMOs. It also had to use instruments from the era of financial repression, such as the cash reserve ratio. While it had a stated aim of reducing the CRR, the CRR did not fall below 9% till the end of the 1990s. As market infrastructure developed, the RBI began to increasingly rely on market-based sterilisation tools while reducing the CRR. However, by late 2003, the RBI's holdings of government securities had dwindled, leaving it enough securities to sterilize just $13 billion of inflows. At the time, a few Asian central banks had started to issue their own debt to sterilize FX intervention. However, an expert committee set up by the RBI to explore new instruments of sterilization recommended that government issue so-called market stabilization bonds whose proceeds would be sequestered in a fund maintained by the RBI that would not be available for the government's use. Convincing the Indian government to raise funds that it would not be able to use but would have to pay interest on was seen as a masterstroke by the RBI, drawing envy from central bankers in other DECs (Reddy 2017). Sterilization was, thus, seen as a tool for the RBI to regain control

over monetary liquidity production. However, its narrow focus on the quantity of reserves ignored the collateral function of government bonds in private credit creation, as elaborated in Chapter 4.

6.3.2 Macroprudential regulation

The RBI did not rely on sterilization alone to insulate the local economy from capital inflows. It was aware of the potential of asset price inflation, flagging it as a concern as early as the late 1990s (Reddy 1998b). Throughout the early 2000s, RBI officials mentioned asset price inflation due to heavy capital inflows as being of concern. The RBI was particularly concerned about asset bubbles in the stock market and the housing sector. In its monetary policy review of October 2005, the RBI articulated its approach to macroprudential regulation. The statement, which echoed Minsky's Financial Instability hypothesis, emphasized the need for countercyclical measures[20].

> Traditionally, banks' loans and advances portfolio is pro-cyclical and tends to grow faster during an expansionary phase and grows slowly during a recessionary phase. During times of expansion and accelerated credit growth, there is a tendency to underestimate the level of inherent risk and the converse holds good during times of recession. This tendency is not effectively addressed by the prudential specific provisioning requirements for the impaired assets since they capture risk ex post but not ex ante. The various options available for reducing the element of pro-cyclicality including, among others, adoption of objective methodologies for dynamic provisioning requirements, as is being done by a few countries, by estimating the requirements over a business cycle rather than a year on the basis of the riskiness of the assets, establishment of a linkage between the prudential capital requirements and through-the-cycle ratings instead of point-in-time ratings and establishment of a flexible loan-to-value (LTV) ratio requirements where the LTV ratio would be directly related to the movement of asset values. (RBI 2005b)

Between September 2004 and August 2008, the RBI raised risk weights and provisioning norms for bank lending to several sectors, such as housing loans, commercial real estate, capital markets exposure and non-bank finance

[20] In his memoirs, RBI Governor Reddy said he would hand out copies of Charles Kindleberger's "Manias, Panics and Crashes" to drum up support for his countercyclical policies, which were unpopular with the government and the corporate sector.

companies (see Sinha (2011) for a summary of the RBI's countercyclical measures)). The RBI governor during the period also made frequent references in his public statements to signs that the economy was "overheating", inviting the ire of the finance minister for his pessimistic comments (Reddy 2017: p. 295).

To summarize, India's Neoliberal ML framework was based on the following principles:

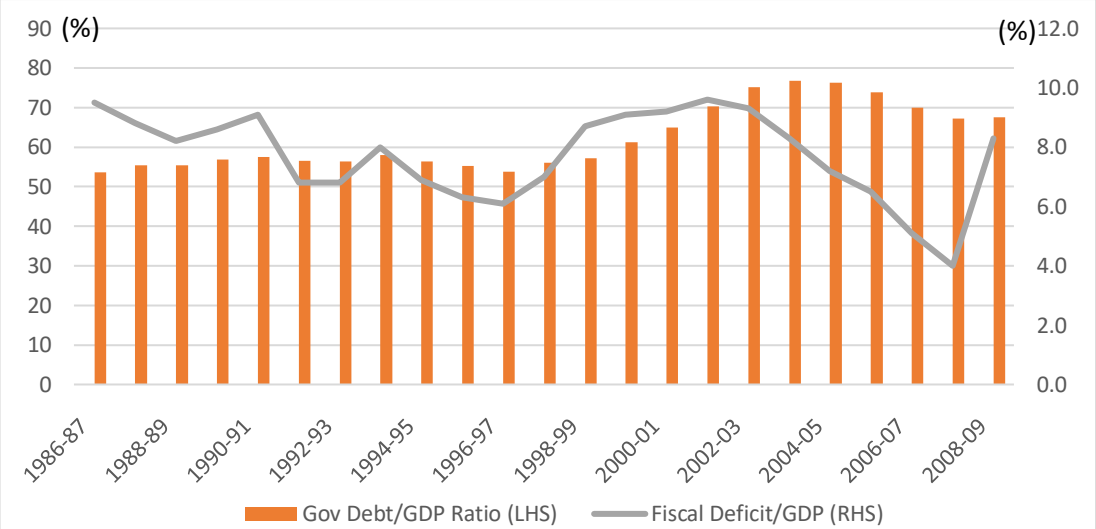
a) Prohibition on deficit monetisation in line with the tenets of inflation targeting
b) Capital account liberalisation governed by hierarchy of flows, with equity preferred over debt, long-term over short-term, and aversion to currency mismatches on balance sheets of local non-bank firms.
c) FX purchases by the central bank to prevent overvaluation of local currency, FX sales to prevent rapid currency depreciation.
d) Sterilization and macroprudential regulation to contain effects of FX purchases.
e) Currency market regulations to prevent carry trade by residents, short-selling of local currency by foreigners.

6.4 Goodbye Fiscal Dominance, Hello Global Dominance?

Even after the end of deficit monetisation in the 1990s, the RBI has consistently complained about fiscal dominance of monetary policy, pointing to what it saw as excessive government borrowing. The RBI stuck to its line on fiscal dominance even when the macroeconomic reality did not fit its narrative. For instance, the early 2000s were characterised by low inflation and a moderate current account deficit despite a high fiscal deficit, undermining the RBI's argument that high fiscal deficits led to high inflation and a high current account deficit. The RBI's response was to take recourse in the narrative that high fiscal deficit might result in the "crowding out" of private sector investment (Reddy 2000).

It is difficult to evaluate whether India exhibits fiscal dominance of monetary policy because proponents of the fiscal dominance hypothesis do not lay out convincing criteria to establish fiscal dominance. The mere existence of a fiscal deficit does not indicate fiscal dominance as deficits are not monetised, debt is. As shown in Figure 27, there is little correlation between the size of the fiscal deficit and the government's borrowing during a given financial year. For instance, the government debt/GDP ratio rose sharply in the early 2000s even as the fiscal deficit was falling. The contrasting trends in the fiscal deficit and government borrowing are likely due to the issuance of additional securities to sterilize foreign inflows[21]. The period following the reforms of 1991 saw the transformation of government securities from being a tool to support government spending into an asset class attractive to foreign investors, a phenomena seen in many DECs (Gabor 2020, Mushtaq 2002).

Figure 27 India Public Finance Indicators (1986-2009)



Source: RBI HBS Table Nos. 236,237

Consequently, the size of outstanding government debt had little connection to the scale of the fiscal deficit. The 3% fiscal deficit target specified in the Fiscal Responsibility and Budget Management Act did not have a theoretical basis, and

[21] Data disaggregating sterilization securities and government securities for the period is not available.

was arrived at as a result of negotiations between legislators. The RBI's relentless attack on fiscal dominance set the stage for acceptability of capital account liberalisation among government policy makers.

However, from the early days of liberalisation, the RBI struggled to manage the monetary effects of capital inflows. In a speech in 1994, the then RBI governor C. Rangarajan warned about the challenges posed by FX monetisation.

> The monetisation effect of large foreign capital inflows and the consequent inflationary impact on monetary expansion is a major concern ... In this context, active open market operations by the Reserve Bank in government securities would be an integral part of monetary policy endeavour to stabilise the inflows (RBI 2013a, p.594-595).

Since the market infrastructure was not sufficiently developed in the early 1990s to handle largescale OMOs, the RBI had to resort to the keeping the cash reserve ratio high even though a high CRR was reminiscent of the era of financial repression. To prevent a high CRR from eating into banks' profits, the RBI also paid interest on a portion of excess CRR. Paying interest on CRR violated one of the RBI's unofficial rules for managing its balance sheet in the post-reforms era—to not take on domestic interest-bearing obligations (Reddy 1997). This violation was deemed as acceptable during a period of financial transition. However, the other two rules for balance sheet management—the central bank's balance sheets should be dominated by foreign-currency rather than local-currency assets and that the central bank should not provide exchange-rate guarantees—were considered sacrosanct.
FX monetisation was, thus, in line with the RBI's rules for managing its balance sheet.
The RBI's preference for FX monetisation (FX purchases) over deficit monetisation was reflected in the language the RBI used to describe its monetary operations. For instance, while the monetary effects of government deficits had to be "neutralized", the monetary effects of FX inflows could be "sterilized". References to FX monetisation were extremely rare, while

references to deficit monetisation were common. Instead, FX monetisation or demonetisation was referred to as FX intervention.

The IT and MF legs of the IT-KAL-MF framework focussed on keeping the nominal exchange rate within a permissible band around the real exchange rate through FX (de)monetisation, and keeping the amount of reserves in the banking system in line with its monetary target through sterilization. This thesis has argued that the RBI's monetarist fixation with the amount of reserves as the sole barometer of monetary conditions meant that it did not fully consider the macrofinancial implications of FX inflows. All FX inflows result in the creation of new spending power in the economy in the form of local bank deposits, as Chapter 5 demonstrated. These bank deposits increase the position-making requirements of banks and demands for monetary liquidity. The new spending power created by FX inflows cannot be destroyed in the absence of FX outflows. Converting reserves to government bonds through sterilisation, only changes the form of the spending power, and ignores the role of government bonds as position-making assets (PMAs). Empirical research shows that an increased supply of government bonds, rather than crowding out private investment, acts as a liquidity buffer for subsequent credit expansions, as pointed out in Chapter 4. In its enthusiasm to end deficit monetisation and increase its discretionary power over macroeconomic conditions, the RBI embraced FX monetisation. Fiscal dominance ended, but the RBI's policy moves left it with much less control over monetary policy and credit conditions in the economy than it had anticipated. Former RBI governor Reddy admitted as much in his memoirs: "We started to wrest autonomy for the RBI by restraining fiscal dominance in the conduct of our monetary policy. We ended up fighting dominance of a more capricious source, global capital" (Reddy 2017, p. 4247).

According to Governor Reddy's memoirs, the government was more in favour of rapid capital account liberalisation than the RBI. "There were signs of excesses and imbalances in the global economy (in 2005-06) and to some extent in our economy. So, I was seeking support for restraints on capital inflows and tightening monetary

policy. The policymakers in Delhi were unwilling or afraid of resisting capital inflows beyond a point." (Reddy 2017, p. 4025). However, the RBI's capital account management strategy centred around reducing currency and maturity mismatches on local balance sheets. This strategy made it difficult to resist calls from government and the corporate sector to liberalize inflows that did not result in significant currency or maturity mismatches, such as foreign investment in longer-term local-currency bonds and equities. Capital account liberalisation accelerated throughout the halcyon days of the 2000s prior to the GFC, entrenching Global dominance of monetary policy. As capital inflows rose, macroprudential regulation had to shoulder more of the burden of preventing the formation of asset-price bubbles.

6.5 Conclusion

RBI prides itself on its macrofinancial management following the economic reforms of the early 1990s. It attacked deficit monetisation in India with zeal, succeeding in convincing the government to end automatic monetisation of the deficit and to enact fiscal responsibility legislation. Unlike many other Asian DECs in the 1990s, who opted for a fixed exchange rate and capital account liberalisation, Indian policymakers favoured a managed float and substantially stricter capital controls, especially on foreign-currency loans and debt issuance. The RBI was an early adopter of the concept of a hierarchy of capital inflows as well as macroprudential regulation.

This chapter interpreted these developments through a Minskyian theoretical framework developed in Chapter 4 that focusses on how the central bank uses its balance sheet to provide monetary liquidity. It narrated the shift from a Developmental to a Neoliberal monetary liquidity framework. The RBI's Neoliberal framework prioritized exchange-rate stability and a narrow sense of monetary stability as represented by the amount of reserves in the banking system. Consequently, the RBI relied on sterilization and macroprudential regulation to regain control of monetary liquidity. However, as Chapter 4 showed, sterilization

only converts the new spending power embodied in capital flows from one form to another and does not sequester or destroy it. It was an ideological choice of the RBI to prefer to purchase FX assets rather than to monetise sovereign debt to provide monetary liquidity to the banking system. In its enthusiasm to end fiscal dominance, the RBI set the stage for global dominance of monetary policy, which left it when less control over monetary policy and credit conditions than it had anticipated.

The next chapter is centred on a Scam which surfaced less than a year after the BoP crisis. The chapter interprets the causes of the Scam and its aftermath in terms of Pillar 2 of the liquidity framework, which is position-making structures (PMS).

Chapter 7 Doubling Down on Bank-Based Finance: Lessons From The Securities Scam

On 23rd April 1992, an Indian newspaper reported that the country's largest bank, State Bank of India (SBI), was immediately demanding 5 billion rupees ($192 million[22]) owed by the well-known broker-investor, Harshad Mehta, for transactions in government bonds. The Bombay Stock Exchange's benchmark Sensitive Index, which had risen about 130% since the beginning of the year on the back of stocks Mehta was rumoured to have invested in, crashed on the news. Around the same time, it became public that the RBI was investigating large discrepancies in the SBI's accounts of its holdings of government securities. In the following weeks and months, it emerged that several banks and non-bank lenders had exploited loopholes in the process for clearing and settling transactions in debt securities to short-sell government bonds--in contravention of RBI rules. Proceeds from these short sales were illegally transferred to stock brokers such as Harshad Mehta, who built up massive speculative positions in the stock market. This came to be known in popular parlance as the 'Harshad Mehta Scam'. Estimates of the total misappropriation of funds in the Scam ranged from 36.51 billion rupees to 83.83 billion rupees, or 0.6%-1.4% of GDP[23] (Parliament of India 1993, p. 17). In a reflection of the size and complexity of the Scam, a Joint Parliamentary Committee was set up to investigate all aspects of the Scam, the second such committee in independent India's history. The RBI set up a separate committee to investigate the role of banks and financial institutions in the Scam. In the aftermath of the crisis, the then governor of the RBI and the heads of several state-run banks resigned or were dismissed, and several brokers and bank executives were charged with criminal offences (Parliament of India 1993, p. 17).

The long-term impact of the Scam has largely been ignored by the academic literature and media. This is possibly because the Scam was framed in the media as

[22] India's exchange rate was pegged at 26 rupees to the U.S. dollar in 1992

[23] GDP of India at factor cost and at current market prices was 6,135.28 billion rupees in the financial year ending March 1992.

a stock market scam due to the high profile of its chief protagonist, Harshad Mehta, and the wild swings in stock prices during the Scam. The role of the banking system and the debt market in the Scam has not received the same amount of attention, as Shah (1999, p. 191) points out. The academic literature, on the other hand, has focussed on flaws in the clearing and settlement process for government securities that were exposed by the Scam (eg. Damachis 1994, Shah 1999). The RBI, in its official history, acknowledges that the Scam "strengthened the bias towards a gradualist approach to financial sector reform" (RBI 2013a, p. 916). However, it doesn't elaborate on this "gradualist approach" or *how* the Scam influenced the approach of policymakers to financial sector reform. This thesis argues that the effect of the Scam went far beyond technical changes by authorities to what traders refer to as the "back-end" process of clearing and settling transactions in government securities. It alerted the central bank to the possibility that financial innovation in the money markets could be extremely destabilizing if not supervised properly, and to the need to pay close attention to the activities of money market participants. The Scam was pivotal in shaping the RBI's cautious attitude towards leveraged trading in the money market.

This chapter reinterprets the Scam and its fallout through the lens of Pillar II of the liquidity regime framework. Chapter 3 introduced the concept of position-making structure, which is the mechanism that facilitates financing of essential assets in the money market. Chapter 5 elaborated the differences between the two types of PMS'—deposits-focussed PMS which is geared towards meeting position-making requirements arising from deposit liabilities, and a repo-focussed PMS, which is geared towards financing of collateral through repo liabilities. The key difference between the two is leveraged trading of collateral is facilitated in the latter and restricted in the former.

Accordingly, this thesis reframes the scam of as a crisis of the repo-focussed PMS that had emerged in the shadows of a deposits-focussed PMS. The RBI response to the Scam was to double down on the deposits-focussed PMS that existed before the Scam but with several structural changes that increased its control over the money market and the broader financial system. Consequently, the RBI emerged a

far more important player in the financial system than it was before the Scam and India's financial structure remained resolutely bank-based, bucking the global trend towards market-based finance. This is not an exhaustive account of a staggeringly complex scam which involved elements of financial innovation as well as outright fraud. Rather, it is an analytical account of the role the Scam played in shaping the trajectory of the money market structure and the broader financial system in India.

The chapter is organized as follows: The first section paints the picture of the Indian money market before the Scam as a poorly regulated deposits-focussed PMS without a clear position-making asset (PMA) despite the attempts of the RBI to develop the bill-of-exchange as a PMA. The lack of regulatory oversight resulted in the development of repo-focussed PMS finance in the shadows. The shadow system had key features of a repo-focussed PMS but lacked important safeguards. This shadow system was at the root of the Scam, which is described in the second section. The third section examines the three lessons that the RBI drew from the Scam. The fourth section highlights the contrast between the Indian central bank's response to the Scam and the actions of U.S. authorities following a series of scams in the U.S. repo market in the 1980s and early 1990s.

7.1 The Position Making Structure Till the 1990s

This section describes how position-making was carried out in the Indian market until the 1990s. It starts with a very brief overview of the Indian financial system, chronicles the struggles to promote bills of exchange as PMAs in a deposits-focussed PMS and, lastly, the emergence of repo-focussed PMS in the shadows.

7.1.1 Overview of India's Pre-1991 Financial System

The RBI describes the period before 1991 as the "developmental" phase of India's financial system and the subsequent period as the "reform" phase (RBI 2013a, p. 4). The priority for the financial system during the developmental phase was expanding access to financial services and meeting the financing needs of the government's Soviet-style five-year plans. Two waves of bank nationalisation in 1969 and then in 1980 had brought most of the banking sector under state control, with state-run banks accounting for 91% of the sector's assets in 1990 (Hawkins

and Mihaljek 2001, p. 8). Banks were required to hold 15% of their net demand and time liabilities (NDTL) in central bank reserves to fulfil the cash reserve ratio (CRR) and 48% of NDTL in gold, sovereign or sovereign-backed debt to fulfil the statutory liquidity ratio (SLR), as of 1990 (RBI 1991). The SLR was seen as a tool to compel banks to finance the government's large borrowing programme, which was also aided by the RBI's heavy participation in bond auctions. The RBI, in its own words, had the "unenviable task of neutralising the inflationary impact of growing budgetary deficits by mopping up large increases in reserve money" (RBI 2013a, p. 44). As most lending and deposit rates were set by the RBI, CRR and SLR were used as the main instruments of monetary control. Most lending and deposit rates in the banking system were fixed by the government and the RBI, with "an element of cross-subsidization" as credit was available at concessional rates for priority areas. Apart from CRR and SLR, banks also had so-called priority-sector lending requirements aimed at channelling funds, sometimes at discounted rates, to borrowers identified as underserved. The RBI also had refinance facilities for bank credit to specific sectors such as exports, food production, etc. Banks were not supposed to be in the business of long-term finance, which was the job of a clutch of specialist financial institutions, most of which were sponsored by the government or the RBI and had access to RBI refinance. Bonds of some of these institutions also counted towards banks' SLR requirement, which reduced their cost of funding.

7.1.2 Struggles to Develop Bills of Exchange as PMAs

India's money market till the 1990s was marked by a perpetual struggle to develop bills of exchange as a PMA in the template of the London money market. Starting from the 1950s, the RBI sought to develop the commercial bill of exchange as a money market instrument. It was envisaged that banks and financial institutions would discount and rediscount bills of exchange, which would serve as a store of short-term funds in the money market. It was also hoped that bills of discount would serve as a medium of exchange, with the RBI stipulating that for this to take place, the bills would have to be guaranteed by both the borrower's and the lender's respective banks (Mody 1986, p. 2129).

In 1952, the RBI introduced a Bills Market Scheme that allowed banks to rediscount bills of exchange maturing within 90 days at the RBI as a means of conferring them with safe asset status (Parekh 1952, p. 112). The RBI set a floor on the value of individual bills tendered for exchange, presumably to restrict the supply bills to those of larger credit-worthy borrowers and exclude indigenous bills of exchange, also known as *hundis*. The scheme was modified in 1970 to allow more institutions to rediscount bills at the RBI and to simplify the procedure (Mody 1986, p. 2129). A succession of RBI-appointed committees, starting with the Deheja Committee in the 1968 (Velayudham 1987, p. 779), recommended ways to promote a "bill culture" and a bill market. Following the recommendations of the Report of the Working Group on the Money Market (Chair: N. Vaghul), published in 1987, the Discount Finance House of India (DFHI) was set up to make markets in bills of exchange as well as treasury bills. However, both the supply of commercial bills for discounting as well as the liquidity of those bills were an issue. Supply failed to pick up because companies preferred the "cash credit" (lines of credit) system of raising financial resources from banks to the more cumbersome and time-consuming bills discounting system (Mody 1986; Velayudham 1987). Another major supply-side obstacle was that large entities would routinely fail to clear bills due to smaller suppliers on time, with government departments being the biggest offenders in this regard (Vaghul 1987, Velayudham 1987). As bills not honoured on time cease to be self-liquidating, banks were reluctant to rediscount them. The RBI also made its rediscount facility for commercial bills more restrictive over the years, as it felt banks were using the bills simply to access refinance from the RBI and not as a money market instrument.

In the absence of a PMA, the bulk of the position-making burden fell on the unsecured interbank market, known locally as the call money market for overnight funds and notice money market for funds up to 14 days (RBI 1991, p. 113). As most deposit and lending rates were fixed by authorities, the interbank call money rate bore the brunt of any changes in monetary conditions. Interest rates in the call money market were so volatile, that the banker's lobby, the Indian Bank's Association, decided to impose an interest rate ceiling of 15%, in 1973

(Velayudham 1987,p. 777). The ceiling rate was frequently changed in response to changes in the RBI's monetary policy. Any increase of the ceiling opened arbitrage opportunities for banks, who would borrow from the RBI and lend at higher rates in the call market (RBI 2013a, p. 543).

There were perpetual debates about whether non-banks should have access to the call money market. The call money market was purely interbank until 1971, when two state-run financial institutions were allowed to enter (Nath and Ghose 2017). In the 1980s, participation was widened, although non-banks were only permitted to lend, not borrow, funds. However, the Vaghul Committee of 1987 and the Narasimham Committee of 1991 recommended that the market be restricted to banks, arguing that as the RBI had less control over non-bank flows the presence of non-banks diluted the RBI's monetary control.

A key feature of the market was it was dominated by a few large lenders and many borrowers, which resulted in an oligopolistic market structure (Velayudham 1987, p. 777). It was hoped that the entry of non-banks as lenders would reduce the lop-sidedness of the market. However, the RBI was uncomfortable with heavy use of call money for borrowing as it is unsecured, and attributed extreme volatility in call money rates partly to "chronic heavy borrowers" (RBI 1990, p. 68). It frequently urged banks to improve their management of funds, and use the call money market only to smoothen "short-term imbalances" and not fund "structural disequilibria" (RBI 1990, p. 149), by which it possibly meant insufficient customer deposits.

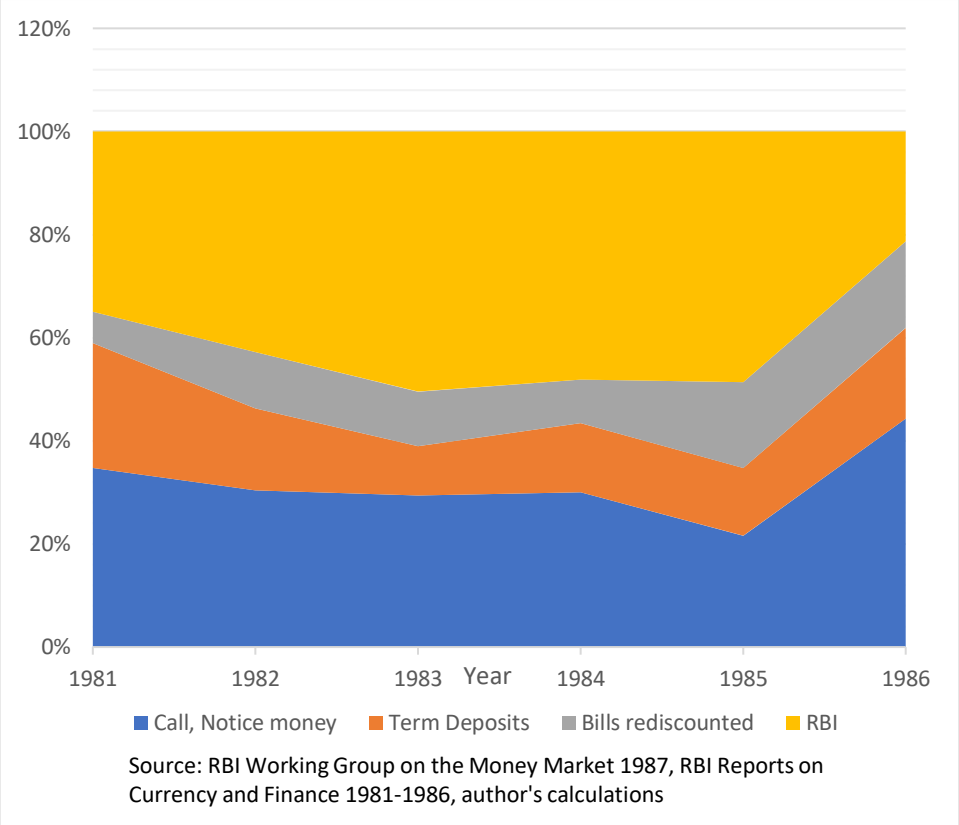
Treasury bills could not be used as PMAs because the discount rate on the so-called *adhoc* (on-tap) 91-days T-bills was unchanged at 4.6% from 1974 onwards, which was well below market interest rates (Vaghul 1987). Ad-hoc T-bills were essentially bills issued by the government when it needed funds and sold to the RBI, which would then sell some of those bills to banks. However, banks which bought the bills to meet their statutory liquidity ratio (SLR) requirements, often rediscounted them quickly at the RBI after the end of the reporting period, because of which the central bank was by far the largest owner of T-bills (Chakravarty 1985). There were a few attempts to auction 182-bill T-bills at rates bid by the market, but these auctions were failures as the RBI accepted a very small

proportion of the bids, possibly because it felt the discount rates quoted were too high (Vaghul 1987). The large SLR requirements encumbered the stock of T-bills and prevented them from functioning as a freely available position-making instrument.

The Chakravarty Committee (Chakravarty 1985) recommended that T-bills be made one of the main money market instruments, for which it was essential that their coupon rates be raised to reflect market conditions. Higher coupon rates would also discourage the government from borrowing to finance deficits and reduce inflationary pressures, the committee said.

The RBI's attempts to develop bills of exchange or, alternatively, T-bills, as PMAs, was driven by its unease with banks relying on the interbank market or on its own balance sheet for position-making (See Figure 28). While deficit monetisation was the biggest source of monetary liquidity, it was at the discretion of the government, not the RBI or the banks. Consequently, banks could not depend on deficit monetisation for position-making. The interbank market was the main source of funding liquidity, while banks could also access RBI refinance for monetary liquidity. However, while the RBI was averse to banks depending on RBI refinance, it was not averse to having an institution with access to RBI funds act as intermediary between the RBI and the money market. The Discount Finance House of India (DFHI) was set up to act as a market maker in bills of exchange, T-bills and the call money market on the recommendations of the Working Group on the Money Market (Chair: N. Vaghul) in 1987. It was partly owned by the RBI and SBI, the largest commercial bank in India. However, it was clear that the DHFI relied on the RBI's balance sheet for market-making, and the RBI had a say in its running. The following quote from a former executive of DHFI is instructive.

Figure 28 Money Market Borrowing Sources (% of total)



> In 1992, (call) money markets (interest rates) zoomed and reached to 110%-120%. … (RBI Deputy Governor) Tarapore called me, and said we have tried our best, do you have any idea how can we bring down the rates. I said yes, you can do that but you will have to help me out. I need some money from you. I don't exactly remember the figure but it was 60-70,000 crore rupees and I told him this money you lent me will be fully secured with G-secs, this won't distort the RBI balance sheet. I said I will lend money on ready forward (repo) basis, buy securities give it to you in ready forward (Bank Official No. 1).

The smooth functioning of the money market required informal coordination and interaction among the RBI, DHFI and banks. The same DHFI executive quoted above continues:

> So, I gave it to the needy people at lesser than the money market rate and I told them this money is for 14 days, you cannot have it overnight. So, you have to manage your house properly. You have to see how you adjust your CRR requirement and average daily balance. And, if you get into surplus, you can't get into the market, you have to give it to me. This meant that the bank could not influence the market. If he

> is laid up with a surplus, he should come back and give it to me. And, I will immediately give it to RBI and get securities back (Bank Official No. 1).

Although DFHI was set up to make markets in commercial bills and T-bills, it also operated in the longer-dated government securities market on a limited basis. However, it was not a very effective market maker because it could not offer two-way quotes for many government securities (Bank Official No. 2). In 1993, a separate institution known as the Securities Trading Corporation of India (STCI) was set up by the RBI to make markets in government securities.

To summarize, in the absence of a PMA, banks depended on the interbank market and RBI refinance for position-making. The RBI was uncomfortable with both options, and decided to set up an institution with access to RBI funding to act as its intermediary in the money market so that banks would not make position on the RBI's balance sheet directly.

7.2 Rise of A Repo-Focussed PMS in the Shadows

The RBI'S official history describes the government securities market as being "dormant" from the 1960s to the 1990s due to the high SLR and the government borrowing at below-market interest rates (RBI 2013a, p. 722). However, as the Scam showed, the market was not as dormant as the authorities had imagined. Interestingly, despite the government securities market playing a central role in the Scam, there is very little literature on the structure of the market before the Scam. This account draws on a book co-written by the journalist who broke the story of the Scam (Basu and Dalal 2014) and interviews with bank executives who were active in the market at the time.

In the absence of a formal market, an informal system developed in a market with about 200,000 crore rupees ($80 billion) of outstanding bonds (Basu and Dalal 2014). Foreign banks dominated, with Citibank said to be virtually controlling the market. As there were no benchmark prices, bonds could be traded at arbitrary prices (Bank Official No. 2). State-owned banks had huge

bond portfolios but their treasury executives were not trained to trade securities (Basu and Dalal 2014). Foreign banks would exploit this lack of trading know-how by striking deals on terms that favoured them. A common tactic was pricing long-term bonds based on the current yield rather than yield-to-maturity. Since long-term bonds tend to have a higher yield (and lower price) than short-term bonds due to an upward sloping yield curve, pricing a long-term bond based on the current yield rather than where it fell on the yield curve was likely to produce a higher price. Foreign banks would sell long-dated bonds at this higher price and buy shorter-dated bonds (Bank official No. 1, Bank Official No. 2). Since there was no benchmark price and no standard method for valuing bonds, the losses would be hidden.

Given their limited capital in the country, foreign banks were more leveraged and depended on repos (then known locally as ready forwards[24]) and short sales to trade as well as meet their SLR and CRR requirements. However, with the arrival of a new chairman in the mid-1980s who wanted to turn a trading profit for the bank, the State Bank of India, India's largest bank, became aware of the ruse and started pricing its bond portfolio according to the yield curve (Bank Official No. 3). SBI also began to exploit its giant securities portfolio to squeeze short-sellers, most of whom were foreign banks (Bank Official No. 1, Basu and Dalal 2014). According to an executive of the SBI:

> I was not averse to trading with foreign banks, and I would provide them a security that they required. Nobody else in the market would provide. But, at the right price. And, if I see if the other party is in a deep spot I would extract my price. (Bank Official No. 1)

Over time, a repo-focussed PMS developed in the shadows of a system which Basu and Dalal (2014) say exhibited "over-regulation on paper, a lack of control in practice, creaky infrastructure and misguided RBI policies". Initially, the use of repos or ready forwards was confined to foreign banks

[24] After the Scam, the RBI stopped using the term 'ready forward' because of its association with the Scam. This thesis uses the terms repos and ready forwards interchangeably.

with limited balance sheets who exploited the lack of technical savvy in state-run lenders. However, as state-run lenders became conscious of potential for trading profits from their bond portfolios, they sought to emulate the foreign banks and increasingly use repos.

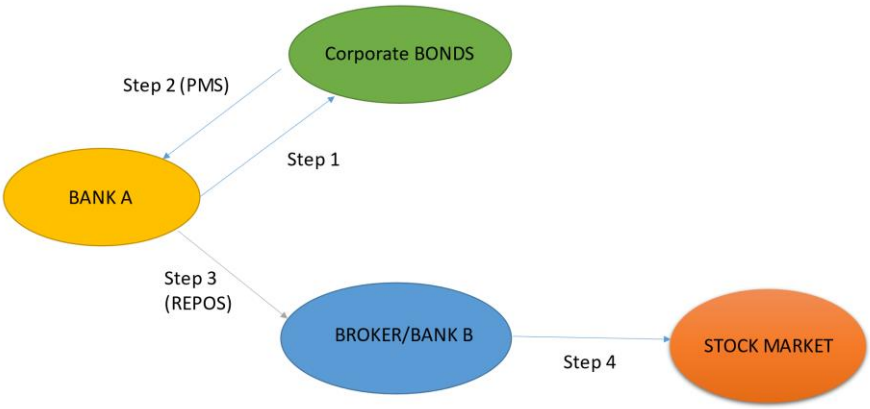
When the government agreed to raise coupon rates on its bonds form the late 1980s to bring them more in line with market rates, banks faced heavy losses as the prices of existing bonds fell. To cover the losses, they would repo the bonds at artificially high prices to brokers, to manage their profits for a particular reporting period (Bank Official No. 2). The brokers, in turn, would be compensated with funding on favourable terms or against unstable collateral such as equity shares (Basu and Dalal 2014). Consequently, a bank-broker nexus developed, which played a central role in the Scam.

7.3 The Scam

The Securities Scam of 1992 essentially involved diversion of funds from the banking system to the stock market (Shah 1999, Basu and Dalal 2014). Figure 29 is a simplified description of the step-by-step flow of funds in the Scam between the different entities that were involved.

Step 1: According to the Janakiraman Committee, the committee instituted by the RBI to investigate the Scam, the source of funds of the Scam was money raised in the debt market by state-run companies in the late 1980s after the government cut its budgeted allocation to them. The companies raised 20,500 crore rupees between April 1986 and March 1992 through bond issuances. Since they were few takers for the bonds and banks had limited lending and investment options because of administered interest rates, banks were the biggest investors in the bonds.

Figure 29 Flow of Funds in Scam



Step 2: Since the companies had no immediate use for most of the funds raised through bonds, these were reinvested with the banks as Portfolio Management Services (PMS) schemes, which offered a higher rate of return than bank deposits. Banks were permitted to accept funds as part of PMS, but these investments had a one-year lock-in period. PMS schemes were seen as investments with market risk and no guaranteed returns. Banks were expected to act as custodians and managers of the funds raised through PMS and keep them separate from their own funds. In practice, banks violated both norms and treated the funds raised through PMS as a form of deposits. The purpose of this round-tripping of funds was to unencumber them from the heavy SLR and CRR requirements that ordinary deposits would have attracted.

Step 3: This step involved the diversion of funds from the banking system to brokers through ready forward (RF) deals, and is the focus of this thesis. It is explained in detail in the following sub-section.

Step 4: The stock market at the time used a "futures-style" fortnightly settlement, in variance with the international practice of rolling settlement, or settling trades as they happened (Shah 1999). Trades were settled only at the end of the fortnight on a netting basis, and even on the day of the settlement, open positions could be rolled over through an indigenous system known as the *badla*, or carry forward.

Badla involved intermediaries lending money or shares to traders who wanted to carry forward their transactions to the next settlement cycle (Kulkarni 1997, p. 2,748). The money diverted to the stock market in the scam was not used to buy shares outright, but leveraged in *badla* transactions, which allowed larger positions to be built.

7.3.1 Diversion of funds from banking system to stock market

The PMS funds were diverted to through the stock market through interbank ready forward (repos) transactions in government securities that were routed through brokers. The diversion was achieved by exploiting deficiencies in the clearing and settlement process for transactions in government securities.

Mechanism of Clearing for Transactions in Debt Securities

Every bank had a Securities General Ledger (SGL) account with the Public Debt Office (PDO) of the RBI, which was a record of the bank's holdings of government bonds and certain other securities. When a government security was sold, the buyer would transfer the funds by cheque while the seller would send a form known as an SGL form to the RBI-PDO instructing it to transfer the particular security from its own account to the buyer's account. It was expected that the seller would take physical delivery of the security at the same time.

The entire system for clearing and settling transaction was manual, and it would sometimes take as long as 10 days for a sold security to be reflected in the buyer's SGL account with the RBI. If the seller of the security did not hold the security when the SGL form was presented, an "SGL bounce" would occur. In short, both the cash and the security leg of transactions in debt securities suffered from delays.

Only transactions in government bonds and certain other securities were recorded in SGL accounts at the RBI. For other types of debt securities, the seller was permitted to issue Banker's Receipts (BR). A BR was a physical unstamped receipt acknowledging that the seller of the security had received funds from the buyer and was committed to delivering the security to the buyer and "pending such delivery is holding the securities in trust for the buyer" (Janakiraman 1993,p. 274).

A BR was thus a token representing ownership of a security which the holder of the BR didn't yet possess.

The Indian Banks' Association had strict rules for the use of BRs among its members. They could only be issued against types of securities that were not recorded in the RBI's SGL accounts. However, in practice, BRs were used with impunity for all types of securities, including securities with SGL book-keeping, such as government securities. They were freely transferred among banks and brokers like a medium of exchange. In some cases, BRs were issued against BRs, which further complicated the chain linking BRs to the underlying security.

Ready Forwards

The supposed inflows from the PMS schemes were diverted to stock brokers primarily through what was then known as a ready forward, which is identical to a repo. It was used by banks in need of cash or of securities, for example to fulfil their CRR or SLR requirements. A RF could be camouflaged as separate buy and sell transactions in securities. This was made easier by the fact that since the government securities market was over-the-counter and consisted of a just a few players, there was no transparency in the pricing of securities.

The RBI was aware of the use of the instrument as early as 1987, and sought to regulate its use rather than ban it outright, possibly because of the dearth of PMAs in the money market. It stipulated that a bank could enter a RF only with another bank and for a maximum duration of one month. The effective interest rate could not exceed the ceiling on the interbank call money rate. However, in practice, banks would habitually breach the ceiling if they needed the funds or securities to fulfil their statutory liquidity ratio (SLR) requirements (Parliament of India 1993, RBI Official No. 2).

The use of BRs allowed ready forward transactions to grow rapidly. Since securities changed hands only for the duration of the RF, banks began to use BRs instead of filing SGL forms with the RBI's Public Debt Office. Once a RF expired, the corresponding BR was simply returned to the borrower of the funds who had

posted the BR as collateral in the absence of the security. Soon, the practice spiralled out of control, with BRs repeatedly changing hands.

> The indiscriminate use of BRs without security backing created a kind of paper money which circulated from bank to bank like a stage army of soldiers and provided an opportunity to brokers to avail of funds of increasingly larger amounts. (Janakiraman 1993, p. 277)

Banks also began to issue BRs against BRs instead of against an underlying security and there were also instances of fake BRs. Selling a BR is analogous to short-selling the underlying security, as the seller doesn't own the security outright and is committed to delivering it at a later date (RBI Official No. 3). Short-selling is a bet that the price of a security will fall. It consists of selling a borrowed security and committing to return the security at a later date, when it is presumably cheaper. Since a BR is a pledge to deliver securities rather than the underlying security, repoing a BR is analogous to reusing collateral. When a fake BR is sold or repoed, it is an instance of naked short-selling, where a security is sold by a seller who neither holds the security nor has borrowed it. As a result, several banks built up substantial short positions in government securities, even though the RBI had banned short-selling in government securities. The income from the sale of securities even against BRs, which were often short sales, was often recorded as artificial investment profits. The RBI first became aware of the Scam in early 1992, when it noticed a substantial discrepancy between State Bank of India's accounts of its G-sec holdings and the bank's SGL account with the RBI.

Instead of connecting borrowers and lenders, brokers were often dealing on their own account. The proceeds of sales and repo transactions were often transferred to brokers' accounts instead of the counterparty banks' accounts. Here again, banks failed to separate their own accounts from their brokers' accounts. In some cases, the same contract was booked at different prices by the two counterparty banks, with the difference transferred to brokers' accounts. In other cases, the same security was sold twice, with BRs used to mask the absence of the underlying

security. This left ever-increasing holes in the balance sheets of banks as they had accounted for securities that they did not possess. As a result, funds raised through the banking system by short-selling government securities were transferred to the stock market.

In other words, the diversion of funds from banking system to the stock market involved (shadow) market-based finance (money market lending for capital market lending) as well as outright fraud. During the Scam, the Indian money market exhibited most of the features of repo-focussed PMS which supported leveraged trading of collateral, such as ease of short-selling, reuse of collateral, and substitution of collateral through BRs. However, it lacked the key safety feature of repo-focussed PMS, which is marking collateral used in repos to market prices daily, which was impossible in any case as there were no market price against which to mark the securities.

7.4 Fallout of the Scam: Three Lessons

Following the Scam, criminal proceedings were initiated against several bank officials and brokers and a Special Court was set up through an ordinance in Parliament to try the accused (Parliament of India 1993, p. 3). Several bank CEOs either resigned or were dismissed. A cooperative bank and a private-sector bank involved in the Scam were liquidated because the extent of their losses was too large, while another bank was placed under RBI observership (RBI 2013a, p. 830).

The Scam was a body blow to the reputation of the RBI. The RBI governor in office when the Scam broke resigned before the end of his term. The Joint Parliamentary Committee report was scathing of the RBI, and its senior officials, in particular.

> As things went, the country had to pay a heavy price in thousands of crores of rupees for the lapses on the part of the RBI top management during the crucial years … The Committee are constrained to observe that it was the top management of the RBI which was wholly responsible for the RBI's contribution to the scam. (Parliament of India 1993, p. 189, 204)

How the RBI recovered from its fall from grace and managed to convince the other players in the Indian financial system to delegate even more power to it is a story that is difficult to tell without access to the RBI's archives and other primary data sources. But, in the aftermath of the Scam the RBI tightened its control over the money market and shored up its regulatory powers over banks, even as it was ostensibly deregulating the banking system. That a market-based financial system did not develop in India was down to the conscious decisions of the RBI and the lessons it learnt from the Scam. Instead, the RBI doubled down on the deposit-focussed PMS system that existed before the Scam, but with much stricter rules around position-making, tighter regulation of counterparties, and the development of government securities as PMAs. The lessons from the Scam can broadly be divided into three groups. The first and most obvious lesson was that the back-end process of clearing and settlement of government securities transactions had to be cleaned up. The second was that there had to be firm rules on position-making and what counterparties could and could not do with PMAs. The third lesson was that these first two rules could only be enforced if the RBI had enough power over counterparties and its zone of influence extended beyond the money market to the other activities of banks.

7.4.1 Lesson 1: Cleaning up Clearing and Settlement of Securities Transactions

According to Shah (1997, p. 191), the reforms were along three themes:

a) Improvements to SGL system: The SGL record-keeping system was computerised to speed it up and make it less susceptible to manipulation. A delivery-versus- payment (DvP) system was put in place, which meant that securities only changed hands in tandem with or following the transfer of cash payments for those securities.
b) Trade-by-trade settlement: Every trade was settled on a gross basis, with no netting or IOUs allowed.
c) Trade reporting: Trades were reported to the National Stock Exchange to encourage transparency in prices. One of the reasons

traders could manipulate transaction prices in the Scam was that there was no publicly available price for a particular security.

Establishment of Clearing Corporation of India (CCIL)

The trade-by-trade system reduced the potential for leverage at the back end, as it was not possible to sell a security unless the seller held the security in their SGL account. However, it also made the system very slow and cumbersome and lead to severe "gridlocks", which is a situation where settlement of one transaction is stalled because of the pending settlement of another transaction, creating an interlocking chain of stalled transactions (RBI Official No. 3). From gross trade-by-trade settlement in both cash and securities, the RBI first moved to net settlement for cash while having gross settlement for securities, and finally to net settlement for both cash and securities in 2002 after it set up Clearing Corporation of India (CCIL), a central counterparty (CCP) (RBI Official No.3). Over time, CCIL became the nerve centre for fixed income and currency trading in India (Nath 2008). All secondary-market transactions in government securities in India, including bilateral trades, are required to be cleared and settled by CCIL. A bulk of trades in derivatives and currency markets are also settled by CCIL. CCIL is the clearing and settlement agent for pledge repo transactions between banks, including bilateral repos and tri-party repos. In the early 2000s, it introduced a popular product called Collateralised Borrowing and Lending Obligations (CBLOs) which involved financial institutions placing collateral with CCIL in exchange for CBLO limits that could be sold for funds. This allowed high-risk counterparties, such as cooperative banks, to participate in the money market. Pledge repos in government securities remain the main method for position-making in the money market, in addition to the interbank market. Further, CCIL operates the most widely used trading platforms in debt and currency markets, such as NDS-OM (for transactions in G-secs), CROMS and TREPS (repos), FX-CLEAR (currencies) and NDS-CALL (unsecured interbank borrowing).

CCIL also maintains a trade repository, which is a record of positions in fixed-income derivatives such as interest-rate swaps, which the RBI has access to. The trade repository allows the RBI to monitor the build-up of leverage through derivatives. RBI officials credit the trade repository with preventing disruption during the Greta Financial Crisis.

> All our interest rate swaps were cleared in CCIL. And we (the RBI) knew the positions, even when Lehmann happened. Because we had this info, we knew exactly the amount of swap positions of all banks and NBFCs, and we could settle them, they had huge positions. We had the information, we knew exactly how much was to be paid by whom. So, I think a Trade Repository is a must, an absolute must. (RBI Official No. 2)

The centrality of CCIL in India's fixed-income and currency markets and the RBI's role in its establishment and operations have allowed the central bank to retain significant influence on trading practices. The RBI has used this influence to prevent the growth of leveraged trading in the money market and the development of a repo-focussed PMS. CCIL has been hailed as a success by Indian policy-makers, with many countries moving to set up central counterparties for debt markets following the Great Financial Crisis. Some market participants complain that CCIL's monopoly in clearing and settlement in most types of debt securities and conservatism in margining requirements has squeezed trading volumes in the debt market.

> If you keep excess margins you will never fail. But then you are blocking so much of capital. Try doing that in the stock exchange. (Bank Official No. 4).

However, most market participants I interviewed, including from foreign banks, said CCIL increased the ease of trading debt securities as well as promoted financial stability.

7.4.2 Lesson 2: Rules for position-making

The RBI was never comfortable with call money as the primary instrument for position-making because it was unsecured[25] (RBI Official No. 4). Bill discounting was viewed with suspicion due to its role in the Scam (Indian Parliament 1993). Ready forwards notionally backed by government securities and bank receipts had been at the heart of the Scam and were restricted in its aftermath. Additionally, a PMA was also required to soak up foreign inflows, which were growing sharply as the Indian economy was liberalizing and globalizing. As a result, there was a conscious strategy to develop a government securities market, which included setting up a new institution called the Stock Trading Corporation of India (STCI) to make markets in G-Secs.

Having a well-functioning bond market would also help prevent irregular transactions from remaining undetected for extended periods. In the absence of a market in government securities, banks involved in the Scam had traded government bonds at arbitrary prices (Janakiraman 1993). As there was no transparency in pricing, heavy short-selling in government securities had gone undetected. One of the RBI's first steps after the Scam was to publish prices of G-Secs daily in newspapers (RBI Official No. 4).

However, the Scam had taught the RBI that even if the safety of G-secs was beyond doubt, these assets could be used in unsafe ways to generate leverage. The RBI prohibited short sales in G-secs, even though the ability to short-sell, or shorting, is overwhelmingly seen by the economics literature as essential for price discovery and market liquidity (Howell 2016, p. 371). The central bank was also against rehypothecation of collateral in repo transactions, which it saw as an indirect form of short-selling[26]. This account of the RBI's approach towards leverage in debt securities is instructive:

---

[25] After the Indian Banks' Association scrapped the ceiling on the call money rate in 1989, call rates became extremely volatile (RBI 1993b). To temper the volatility, the RBI allowed some categories of non-banks to lend but not borrow in the interbank market.

[26] An illustration of rehypothecation is as follows: Suppose A borrow cash from B against the collateral of government bonds in a repo transaction. If rehypothecation is permitted, B can do as she pleases with the bonds (sell or lend) as long as she is able to obtain the bonds (by buying or

> So, this whole business of sale of repo security, whether you should be allowed to sell a repoed security was something we debated for a long time, because we didn't want to allow shorting of securities and *repoing of a repoed security is actually shorting of a security*. We didn't want securities to be shorted because in the scam people were selling securities that they didn't own--naked shorts. And that is what created the problems we had. The hangover from that scam lasted till 2006. Repoing of a security purchased under repo we didn't allow till very very late. And even there we have restrictions. We didn't want the repo market to create 10 times the quantity, because with a single repo you can keep the margins and borrow more and repo more and borrow more securities and then when the interest rates change your cost of borrowing increases and all the value of your securities comes down. And, Orange County (California) went bust because of this ... Therefore the repo market is a big fear. That is again thanks to the Harshad Mehta scam.... Absolutely, there was no doubt that there was a lot of pressure on us to develop the repo market because it was nothing, but short, nothing but naked shorts and we knew that apart from the squeeze you can speculate in the market and take positions. (RBI Official No. 4).

Short-selling in government securities was banned till as late as 2006, when it was allowed with the restriction that short positions had to be closed out by the end of the trading day. In other words, a bond short-sold would have to bought and delivered to the lender of the bond by the end of the day. The rules have been progressively relaxed over the years. Current rules allow short-selling for up to 90 days, with limits on what proportion of outstanding stock can be shorted, depending on whether the security is liquid (0.75%) or illiquid (0.25%).

However, short-selling remains a bone of contention between state-run banks, which have sizeable holdings of government bonds, and foreign banks, which have significantly smaller holdings but are more active traders. Since falling bond prices reduce the value of their bond portfolios, state-run banks are wary of short-sellers. According to media reports, state-run banks engineered a short squeeze in March and April 2017 by refusing to lend

borrowing) when the original repo with A matures. According to the RBI official quoted above, reusing (selling or lending) a bond posted as collateral is equivalent to short-selling the bond.

securities to foreign banks to cover short positions (Bandyaopahyay 2017). The impasse was resolved when a RBI deputy governor intervened in favour of the foreign banks. However, unlike during the Salomon Brothers short squeeze in the U.S. (see next section), there were no penalties imposed on the state-run banks and neither did the RBI issue any public statements on the matter. In February 2021, the chief economic adviser of India's largest lender, the state-owned State Bank of India, called on the RBI to impose restrictions on short sellers to stem a rise on government bond yields.

To summarize, the RBI created government securities as PMAs and promoted pledge repos in government securities as its preferred method of position-making. Pledge repos also became its preferred method to inject or withdraw central bank reserves from the banking system as it curtailed its sector-specific refinance facilities. However, by placing restrictions on short sales in government securities and reuse of collateral in repos it prevented the development of a collateral-based system. In addition, state-run banks, which have large bond holdings but are not active traders acted as a bulwark against short-selling.

The RBI's policy towards primary dealers (PDs) also illustrates its cautious attitude towards leveraged dealing and trading in PMAs. The PD system was introduced in 1996 as the RBI was developing the G-sec market. The RBI initially encouraged standalone PDs as it felt they would be more active dealers in G-secs. Most of the entities which received licenses were subsidiaries of banks. Since securities dealers have limited equity capital, they necessarily rely on short-term market borrowings to fund their inventories of securities. However, the RBI was uncomfortable with highly leveraged PDs (Rajaram and Ghose 2015). From 2000 onwards, the RBI restricted the amount of leverage PDs could take on by placing limits on their borrowing in the unsecured interbank market, imposing capital adequacy restrictions, requiring their respective boards to decided leverage limits and placing them under the oversight of the Board for Financial Supervision—the unit within the RBI that supervised banks (Roy 2004). Further, since there were no

opportunities for short-selling G-secs, PDs could only take long positions. When bond prices started falling from 2004 onwards due to rising interest rates, many PDs faced losses. In 2006, the RBI allowed PDs to merge with their parent banks and started issuing PD licenses to banks (Rajaram and Ghose 2015).

7.4.3 Lesson 3: Beefing Up Regulatory Powers

A key characteristic of bank-based finance is the enmeshing of monetary policy and financial supervision, as showed in Chapter No. 5. Access to the central bank's balance sheet is conditional on submission to the central bank's regulatory authority. Central banks are responsible for both micro-prudential of individual banks and macroprudential regulation. The previous chapter showed how macroprudential regulation became a key strategy for managing the impact of capital inflows. On the other hand, the Scam showed deficiencies in the India's system of microprudential regulation. After the Scam, the RBI argued that instead of dual regulation by the RBI and Finance Ministry, banks must exclusively be regulated by the RBI. The Board of Financial Supervision was set up within the RBI as a separate unit, and the RBI substantially overhauled its regulatory policies. The Banking Regulation Act, 1949 was amended to allow the RBI to levy stricter penalties on banks that flouted its rules (RBI 2014, p. 845). In 2006, the RBI Act was amended to give the RBI all aspects of the money market, including derivatives. The same act clarified the status of repos in government securities as transactions for borrowing or lending funds, rather than as buy/sell transactions. This amendment was in line with the RBI's stance on leveraged trading. It clarified that the money market was the site for lending and borrowing funds and not for lending or borrowing securities.

Another significant outcome of the Scam was the RBI's wariness towards foreign banks, which continues to this day. Led by Citigroup, foreign banks had pioneered the repo-focussed position-making methods that were central to the Scam and their involvement in the Scam was disproportionately large compared to their presence in the country. There was a widespread sentiment

that Citi, in particular, had escaped the full consequences of its actions by transferring many of the senior staff involved out of India and refusing to admit culpability (Basu and Dalal 2011, Bank Official No. 2). Both the RBI's Janakiraman committee report and Joint Parliamentary Committee report placed a large part of the blame for the Scam on foreign banks. The report also said, foreign banks, which were "the biggest originators of the scam" were scornful of local officials investigating the Scam.

> The Committee have no doubt that no foreign bank would have responded with such indifference to directions/queries from the Central Bank of the country of its origin. (Parliament of India 1993, p. 191)

The RBI deputy governor in charge of banking regulation during the Scam suggested that foreign banks were able to ignore the RBI's directives because they carried influence with the government ministers and officials.

The RBI's wariness towards foreign banks after the Scam is not spelt out in policy documents or speeches, but was confirmed by interviewees. A former RBI governor has been candid about his view of foreign banks as an extremely influential but potentially destabilizing force that should be handled with caution (Reddy 2017)[27]. Following the Scam, the RBI made a conscious effort to limit the size and influence of foreign banks in the country. In 1993, one year after the Scam came to light, the RBI removed the exemption for foreign banks from priority-sector lending targets, although their targets were set lower than those for domestic banks. According to the

[27] Y.V. Reddy narrated this incident in his memoirs: 'Above all, I was shaken by my experience during the Fund-Bank (World Bank and IMF) spring meetings in Washington, D.C. It was April, 2004… In Washington, D.C., a senior official of Citibank called on me. He offered to provide assistance to the RBI in preparing guidelines for the entry of foreign banks. Elections have been ordered and a new government is yet to take a position on this matter, I informed him. He asserted that Citibank was confident of ensuring the implementation of the policy, whichever government came to power. I was taken aback. 'Whichever government comes to power': to me, such an assertion indicated the influence that the global financial conglomerates could exercise over the political and decision-making processes in our country. I resolved that we simply could not afford it'. (Reddy 2017, p. 234)

agreement that India negotiated with the World Trade Organization in 1997, foreign banks could be denied new branches if their combined balance-sheet and off-balance-sheet assets exceed 15% of the banking system's total assets.

7.5 Contrast Between Fed and RBI's Responses to Scams

The RBI's response to the Scam stands in stark contrast to the U.S. Federal Reserve's response to a series of dealer failures and scams when the repo market in the U.S. was in its developmental phase in the 1980s and early 1990s. Consequently, the structure of the Indian money market differs substantially from the U.S. money market, which serves as the template for market-based finance (Gabor 2016, p. 975). While regulators in both countries supervised changes to clearing and settlement mechanisms to minimize the possibility of scams and failures, their approach to position-making differed substantially. The Indian central bank took steps to end the shadow repo-focussed PMS that existed before the Scam and increased its supervisory powers over counterparties, thereby reinforcing bank-based finance. The U.S. Fed, on the other hand, took steps to strengthen repo-focussed PMS and continued it lackadaisical approach towards regulating money market participants.

The Fed's response to the most serious failure in the repo market is illustrative of its approach. In 1991, the U.S. repo market was rocked by a short squeeze perpetrated by Salomon Brothers in 1991. The firm "cornered" the market in two-year securities by using client accounts to bid more than the mandated limit for each firm. Since it effectively controlled the stock of two-year securities, it was able to bid up prices for the security, squeezing short sellers who needed to buy the security to close out their contracts. While Salomon Brothers was fined $290 million for breaking rules and engineering a short squeeze, U.S. regulators showed little enthusiasm for stricter supervision of the market. Instead, U.S. regulators agreed to coordinate to "reopen" the issue of a security whenever there were signs of a shortage, "regardless of the reason for the shortage" (U.S. Department of Treasury 1992, p. xiv). In effect, U.S. regulators accommodated speculative trading rather than discouraged it, prioritizing market liquidity over financial stability.

7.6 Conclusion

This chapter reinterpreted the Securities Scam of 1992 and its aftermath through the lens of position-making structure (PMS), which is the mechanism that facilitates financing of essential assets in the money market. It framed the Scam as framed the scam as a crisis of the repo-focussed PMS that had emerged in the shadows of a deposits-focussed PMS. The RBI took two main lessons from the Scam, apart from the obvious one that clearing and settlement mechanisms needed to be strengthened. The first lesson was that leverage of government securities was the key mechanism of the Scam. To prevent leverage of government securities, the RBI banned short sales in government bonds and reuse of collateral in the money market. The RBI also set up a central counterparty that would allow it to keep close tabs on trading positions in the money market. Essentially, the RBI doubled down on deposit-focussed PMS by preventing leverage of collateral and increasing its oversight of the money market. The second lesson was that a bank-based system could only function effectively if the regulator had sufficient supervisory power over banks. The RBI prevailed upon the government to increase its regulatory powers and, also, took steps to limit the size and influence of foreign banks, who had been central players in the Scam. The response of the RBI to the Scam stands in stark contrast to the response of U.S. authorities to similar scams and dealer failures in the U.S. repo market. U.S. authorities' response was to accommodate speculation in debt markets rather than discourage it, with the given reason that strict regulation would hurt market liquidity. On the other hand, Indian authorities prioritized financial stability over market liquidity, opting to strengthen bank-based finance.

Chapter 8 After the Great Financial Crisis: Capital Account Liberalisation Gathers Pace

Chapter 6 chronicled the rise of the Neoliberal monetary liquidity framework in India as part of the economic reforms of the 1990s. It highlighted the key features of the framework, which are:

1) A prohibition on deficit monetisation by the central bank.
2) A hierarchy of capital inflows with equity preferred over debt, long-term over short-term, and avoidance of currency mismatches.
3) A managed float exchange-rate policy enacted through FX interventions and currency trading restrictions.
4) Sterilisation and macroprudential to manage effects of FX purchases by the central bank.

This chapter chronicles the evolution of India's monetary liquidity framework during and after the Great Financial Crisis (GFC). The GFC was the first major crisis of this framework, which had proved remarkably stable up to that point. Between the BoP crisis and the GFC, India had not faced sharp outflows, except for one episode in 1997-98 amid the Asian crisis due to sanctions imposed by the U.S. on the country for carrying out nuclear weapons tests. However, in the 10 years between that episode and the GFC, foreign investors had increased their holdings of Indian shares substantially, increasing the potential for outflows. India's benchmark shares index fell by about 50% during 2008 as foreign investors dumped Indian shares, pushing the Indian rupee about 20% lower against the U.S. dollar. The outflows caused a severe liquidity crunch, particularly for non-bank financing companies and mutual funds, who did not have access to central bank refinance facilities. In response, the RBI opened the liquidity taps, offering liquidity support to the tune of 10% of GDP through a combination of open market operations, pledge repos, cuts in the cash reserve ratio and special liquidity facilities (Patel 2014). To increase the supply of foreign exchange, the RBI raised the limits on foreign-currency bank loans and interest-rate ceilings on deposits offered to

non-resident Indians. The central bank also substantially raised the limits on foreign portfolio investment (FPI) in local-currency debt, violating a key principle of the pre-crisis Neoliberal framework. The Indian government, on its part, invoked the emergency clauses of the Fiscal Responsibility and Budget Management Act and took fiscal stimulus measures worth around 3% of GDP.

This chapter examines changes to the Neoliberal monetary liquidity framework during the GFC, which coincided with a change of RBI governor in September 2008, and following the GFC during the era of quantitative easing. The key changes in the Neoliberal framework were:

i) a move towards formal inflation targeting and the use of OMOs rather than pledge repos to infuse monetary liquidity.

ii) rapid capital account liberalisation, particularly of debt portfolio inflows which had been resisted by the pre-GFC RBI leadership.

iii) a more hands-off approach to exchange-range management.

This chapter shows how these changes set the stage for global dominance of monetary policy and contributed to financial instability. As with Chapter 6, this chapter examines changes to each leg of IT-KAL-MF individually. However, it starts with the KAL instead of the IT leg because liberalisation of debt portfolio inflows was the substantive policy change that shaped the evolution of the framework.

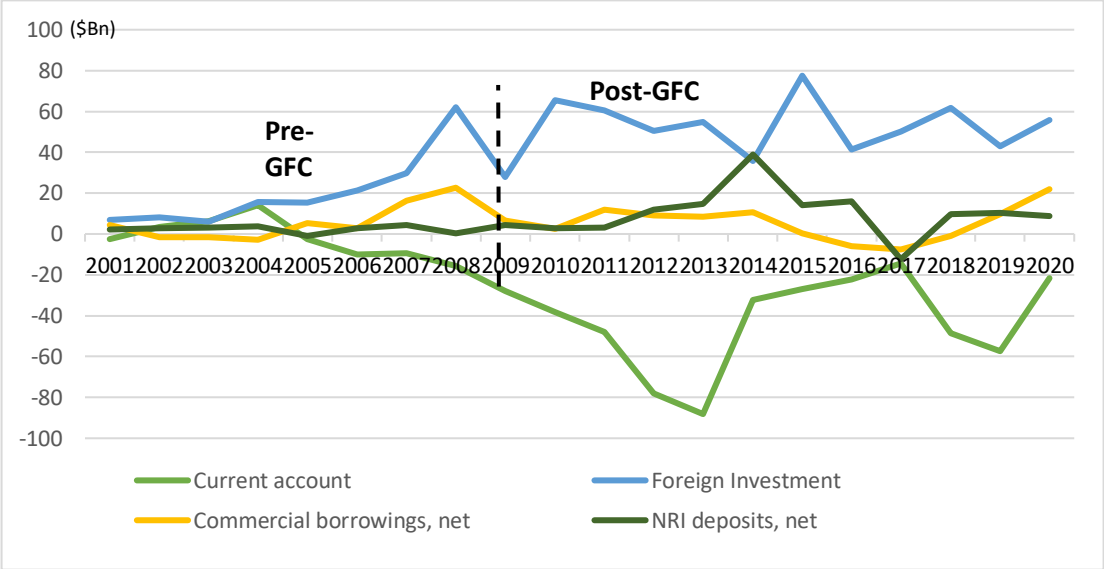
8.1 The KAL Leg: Liberalization of Debt Flows

In the 2000s, the RBI leadership was not in favour of liberalising debt inflows, as pointed out in Chapter 6. However, strong economic growth during the decade increased optimism about India's ability to absorb capital inflows, with the government pressuring the RBI for more rapid capital account liberalisation. In addition, the RBI's emphasis on preventing currency mismatches on the balance sheets of local non-bank firms made it difficult to resist calls for liberalising inflows that did not cause currency mismatches, such as investment in local-currency debt. The limit for foreign portfolio investor (FPI) in government debt, which was $1

billon since 1998, was raised to $1.75 billion in 2004, and then increased at regular intervals to reach $5 billion by June 2008. In September 2008, there was a change of RBI governor.

The new governor, Duvvuri Subbarao, was far less wary of capital account liberalisation than his predecessor. The post-GFC period was also characterized by a significantly higher current account deficit, on the back of a surge in crude prices (see Figure 30).

Figure 30 India Balance of Payments 2000-2020

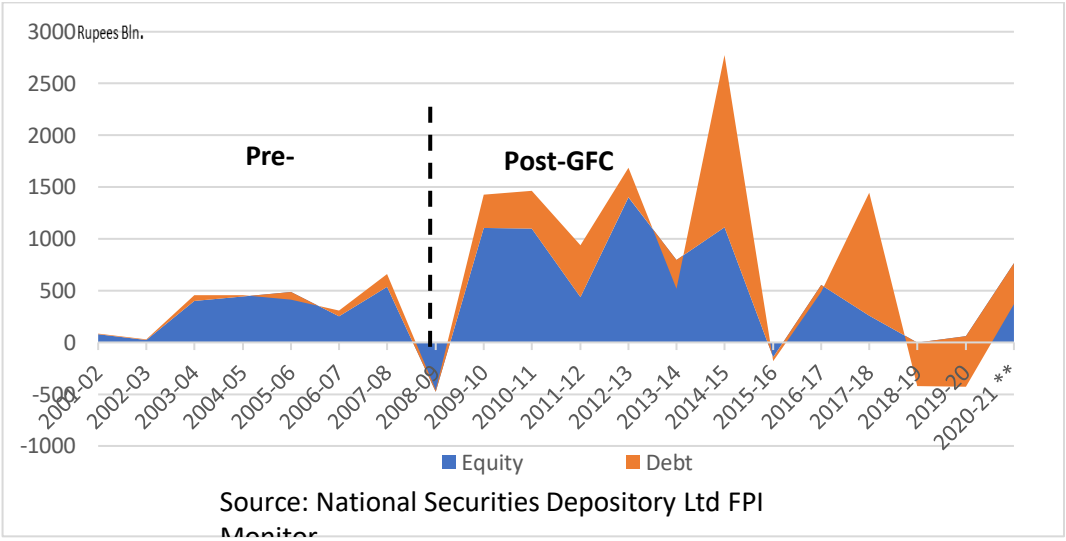


Subbarao said capital inflows were necessary to fill the current account deficit (Goyal 2011). He also dangled the carrot of capital account liberalisation to induce the government to reduce its fiscal deficit (Vasant 2012).

Capital inflow began to pick-up in 2009-10 following the first round of Quantitative Easing. In 2010-11, the RBI imposed some maturity restrictions on debt inflows as well as separate limits for different profiles of foreign investors (see Appendix A.2 for timeline of liberalization of portfolio inflows from 2007 onwards). Maturity restrictions and different limits for different profiles of foreign investors became a standard feature of capital account management. However, following the "taper tantrums" of 2013 which sparked heavy capital outflows from

DECs, liberalization of debt inflows proceeded at a rapid pace, enabling a surge of debt inflow in 2014-15 (see Figure 8.2).

Figure 31 Quantum, Composition of Portfolio Inflows (2001-2021)



Source: National Securities Depository Ltd FPI Monitor

The problem with liberalizing capital flows to fill the current account deficit is capital flows are determined by the Global Financial Cycle which is driven by monetary conditions in the US and not the financing needs of DECs (Rey 2015, Kaltenbrunner and Painceira 2017). The sharpest increase in capital inflows came after 2013-14, when the current account deficit was decreasing, undermining Governor Subbarao's justification for capital account liberalisation. FX reserves should be used for filling the current account deficit, and not for de-risking the exchange rate for FPIs. Liberalizing debt inflows during periods of outflows sets up a destabilizing dynamic of ever-increasing inflows in successive upswing of the global financial cycle followed by sharper outflows. The RBI's capital account policy, thus, amplified the effects of the global financial cycle.

8.2 The IT and MF Legs

The proscription of debt portfolio inflows was not the only feature of the earlier Neoliberal framework that did not survive in the post-GFC era. By the late 2010s, the RBI's "multiple indicators" approach to monetary policy was under attack. A

slew of official committees recommended that the RBI move to full-fledged inflation targeting[28]. In 2014, a committee chaired by Urjit Patel, an RBI deputy governor and future governor, set out the blueprint for the move to inflation targeting, and in the subsequent year the Indian Parliament passed legislation to that effect. Ironically, there was a growing international consensus after the GFC that central banks should avoid focusing on price stability exclusively and, also, consider financial stability, which called for a "multiple target-multiple instrument" approach, as acknowledged by the Urjit Patel committee (Patel 2014).

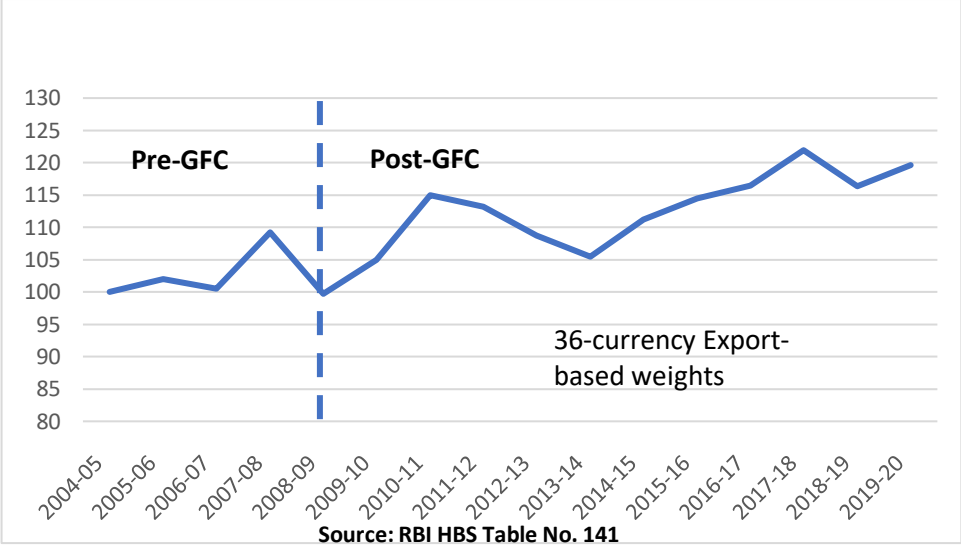
The consequence of prioritizing inflation was a de-emphasis on managing the exchange rate. While the RBI does not make public statements on its exchange rate policy, a former RBI deputy governor, Rakesh Mohan, broken the unspoken rule that former central bank officials should not comment on RBI policy by criticizing the RBI in 2012 for abandoning the managed float policy.

> We have had a policy of a managed float but without an exchange rate target (in the past)… The rupee should reflect fundamentals and not the vagaries of capital flows (Jain 2012).

Mohan also criticized the RBI for liberalizing debt portfolio inflows, calling the move "very risky". The RBI's own estimates of the real effective exchange rate (REER) also show a much great tolerance of currency appreciation by the RBI following the GFC, hinting at the possibility of a change to a more hands-off exchange rate policy (see Figure 32).

[28] These included the High-Powered Committee on Making Mumbai an International Financial Centre, 2007 (Chair: Percy S. Mistry), the Committee on Financial Sector Reforms, 2009 (Chair: Raghuram Rajan), the Financial Sector Legislative Reforms Commission, 2013 (Chair: B.N. Srikrishna).

Figure 32 India Real Effective Exchange Rate



Source: RBI HBS Table No. 141

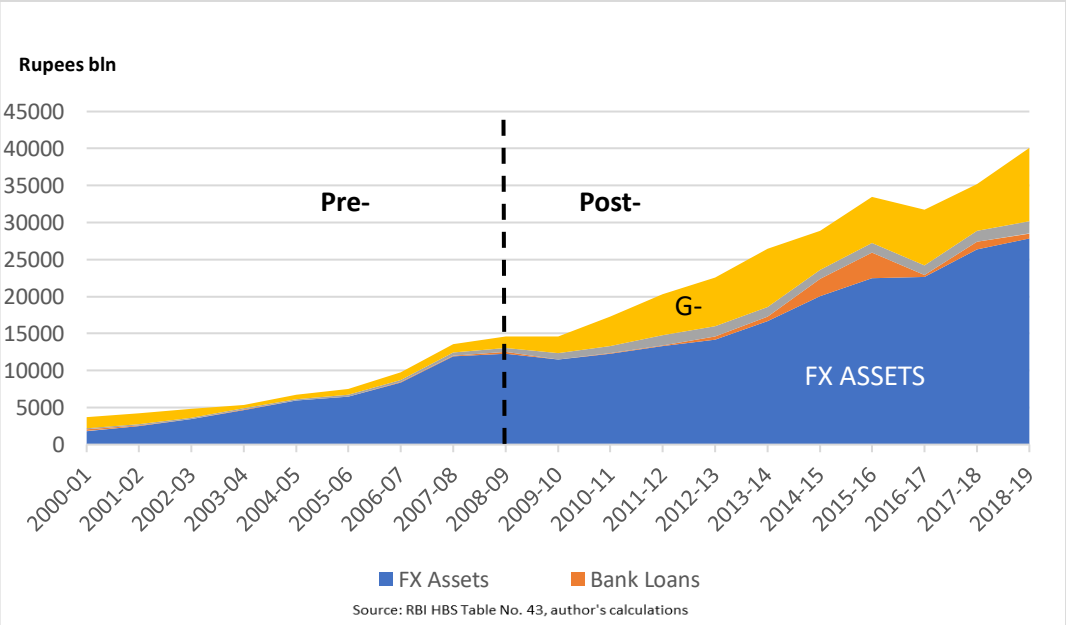
As the RBI's tolerance of currency appreciation increased, the addition of FX reserves to the RBI's balance sheet slowed. However, a lower level of FX monetisation by the RBI meant a higher demand for monetary liquidity, especially during periods of heavy capital inflows (Jain 2012). Banks increased borrowing from the RBI's Liquidity Adjustment Facility (overnight pledge repo window), drawing the opprobrium of the central bank who felt banks were using the RBI for liquidity management. The RBI's Financial Stability Report in 2013 noted that banks had stepped up borrowings from the RBI's overnight repo window, "suggesting that banks have become dependent on central bank support in meeting their structural funding deficits. Prior to mid-2010s, banks borrowed only occasionally from the Reserve Bank despite high credit growth" (RBI 2013b, p. 51-52). In July 2013, the RBI set limits on overnight repo borrowing by banks during a period of rapid currency depreciation to make it more expensive to short the rupee. The restrictions on overnight repo borrowing became a standard feature of liquidity management after the endorsement of the Urjit Patel committee, which laid the blueprint for inflation targeting.

> The LAF (Liquidity Adjustment Facility) to a degree has become a conduit for gaming central bank liquidity and substituting for efforts to access market liquidity. In order to improve transmission of policy rate changes … the RBI (must) de-

> emphasise overnight repos for liquidity management and progressively conducts its liquidity management primarily through term repos of different tenors (Patel 2014, 36-37) .

While it reduced its repo operations, the RBI increased the use of open market operations (OMOs) or outright sale and purchase of government debt by the RBI. OMOs, unlike repos, allow central banks to directly influence the price, and, hence market liquidity, of government bonds in secondary markets. Since the RBI was the government's debt manager and managed auctions of new government debt, it also influenced coupon rates on government debt. In a throwback to the days of "financial repression", the RBI's monetisation of government securities through OMOs rather than FX assets became the main source of monetary liquidity from 2009 to 2014 (see Fig. 33).

Figure 33 Composition of RBI Assets (2000-2019)



8.3 The Fiscal Dominance Genie Resurfaces

As the fiscal deficit increased due to the government's efforts to stimulate the economy during the GFC, fiscal dominance re-emerged as a bogeyman. In a speech in 2010, RBI Governor D. Subbarao said:

> It will be less than honest not to acknowledge that the autonomy of monetary policy from fiscal compulsions is once again under threat, and resolving that threat requires credible efforts by both governments and central banks (Reuters News 2010)

In subsequent years, relations between the government and the central bank became increasingly strained as the government pushed for cuts in the policy rate while the RBI pushed for cuts in the fiscal deficit. Amid growing bad loans in state-run banks, an influential narrative emerged that the government was eroding the autonomy of the RBI on two fronts--through fiscal dominance of monetary policy as well as stymieing the RBI's efforts to regulate state-run banks with the same rigour as private-sector banks.[29]

The rapid increase in OMOs by the RBI was held up as evidence of fiscal dominance. It was argued that that the high fiscal deficit was forcing the RBI to ramp up OMOs to maintain stability in government debt markets, and subsidize the government's borrowing by propping up bond prices (Financial Times 2013). Prominent financial economist and former RBI deputy governor, Viral Acharya, argued that OMOs in the context of fiscal dominance meant that the RBI's liquidity management policies and its rate-setting policies could often be working at cross-purposes.

> When undertaken in large quantities, liquidity injections improve bond prices and transfer treasury gains to banks, helping recapitalize public sector banks while simultaneously lowering the cost of rolling over government debt. This creates an incentive to get the liquidity policy to be fiscally dominated rather than keeping it unconstrained to achieve the objective of ensuring that short-term money market rates tug closely the policy repo rate set by the monetary policy authority. In fact, once sufficiently fiscally dominated, the liquidity policy can control most of the government bond yield curve and prices, rendering the rate-setting process of monetary policy authority effectively irrelevant. For example, one arm of the central

[29] In the post-GFC period, current and former RBI officials have become increasingly vocal about safeguarding the autonomy of the RBI. A book released after his term as RBI deputy governor ended in 2019, prominent financial economist and former RBI deputy governor Viral Acharya had a section called 'Fiscal Dominance: A theory of Nearly Everything'. He broadened the notion of fiscal dominance to include the dominance of India's banking sector by state-run banks, arguing that fiscal dominance was harmful for monetary policy as well as financial stability (Acharya 2020). Acharya also claimed the government was pushing for liberalisation of debt inflows to facilitate the funding of its borrowing programme.

> bank can keep the policy rate unchanged due to inflation concerns, whereas its other arm can act fiscally dominated in moving all other rates. (Acharya 2020, p. 580)

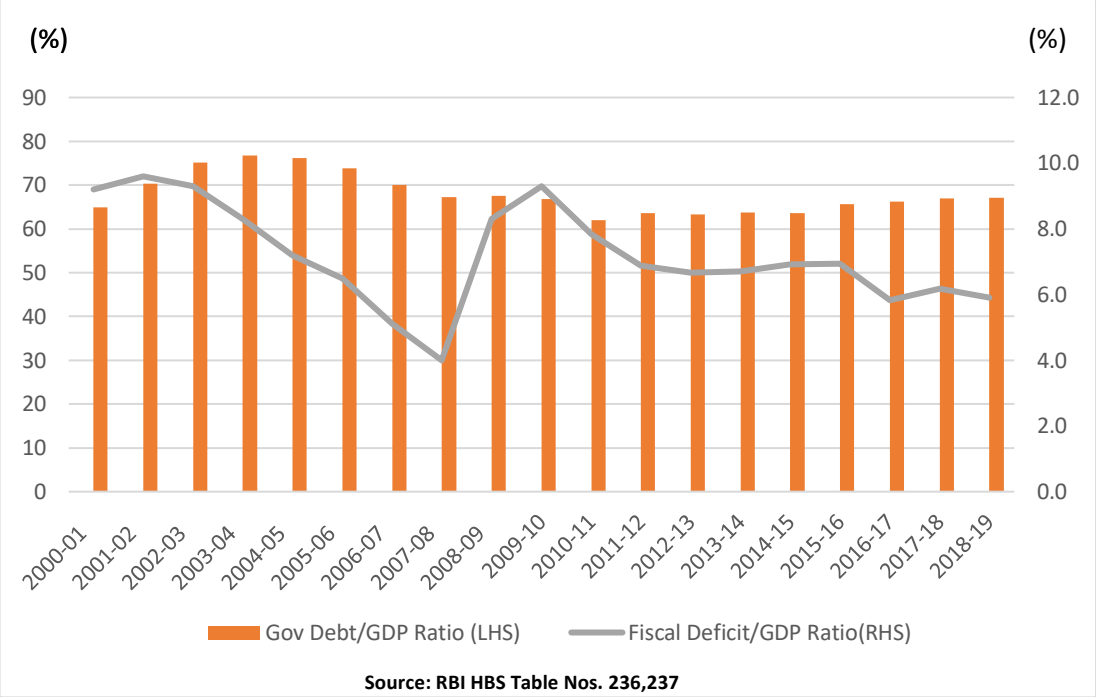
Further, Acharya argued that RBI's OMOs were at a scale that they had become the predominant factor determining government bond prices.

> My one lament here is that the play in the Indian government bond markets—and the media and analyst chorus that goes with it—is gradually evolving into bets on the extent of the central bank's market interventions, creating a vicious trap of meeting ever-rising expectations that the RBI hasn't been unshackled from and a crutch that bond markets haven't learned to walk without. (Acharya 2020, p. 435).

However, it was the RBI's decision to slow down purchase of FX assets as well as put limits on pledge repo borrowing by banks from its liquidity adjustment facility. As chapter 5 showed, FX inflows are monetized by default, either by the central bank directly buying FX assets or by providing reserves to domestic banks through OMOs to keep short-term interest rates on target. FX inflows create local bank deposits and a demand for monetary liquidity that must be met through one form or another.

The fiscal dominance claim was contentious. The link between the fiscal deficit and government debt issuance had been severed prior to the GFC, as shown in chapter 7. India's sovereign debt/GDP ratio has been stable between 60% and 70% for the last twenty years, except for a few years prior to the GFC when the government issued sterilization bonds. During those years, the fiscal deficit fell sharply (see Figure 34). Increases in the sovereign debt/GDP ratio both before and after the GFC have been driven by the issue of sterilization bonds rather than an increase in the fiscal deficit. The sharp increase in the fiscal deficit after the GFC due to fiscal stimulus did not result in a substantial increase in government debt issuance.

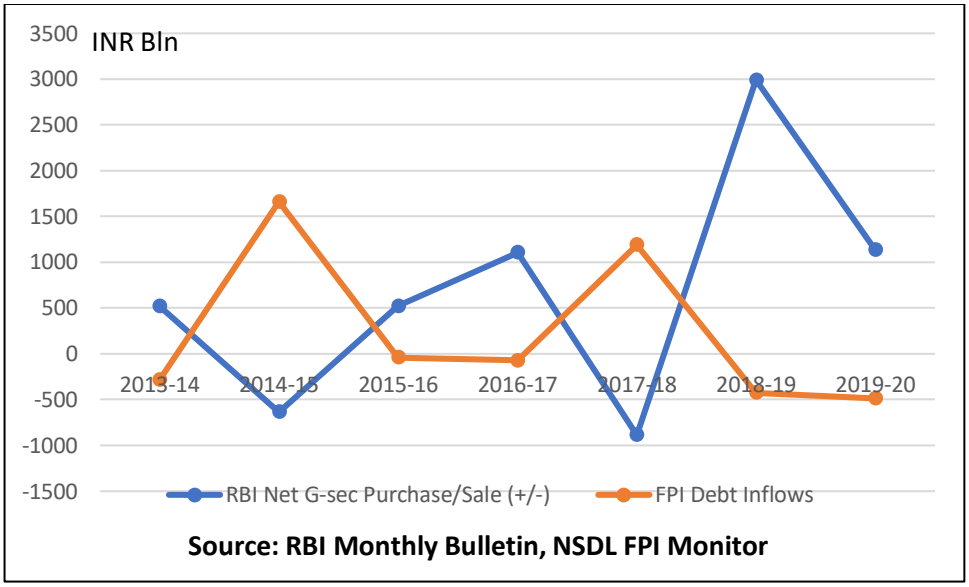
Figure 34 India Public Finance Indicators (2000-2019)



Source: RBI HBS Table Nos. 236,237

Acharya's (2020) arguments echoed the standard neoclassical view that links high fiscal deficit to an increase in government bond yields due to excess aggregate demand and a rise in real interest rates (Elmendorf and Mankiw 1999), a change in inflation expectations (Baldacci, Gupta, and Mati, 2011) or expectations of higher fiscal deficits (Blanchard 1984). In this view, the RBI's OMO purchases were necessitated by the increase in bond yields due to the high fiscal deficit. However, the RBI's OMOs in the post-GFC period appeared to move in tandem with debt inflows (see Figure 35). OMO purchases tended to be high during periods of debt outflows, and low or negative during periods of debt inflows.

Figure 35 RBI OMOs and Debt Inflows



This indicates the possibility that the RBI was supporting government bond prices through OMO purchases not due to the high fiscal deficit but due to volatile debt flows. While the RBI was attacking fiscal dominance of policy, it was entrenching global dominance of monetary policy by liberalizing debt portfolio flows.

8.3.1 Is the RBI A Dealer of Last Resort?

In the spring of 2020, as the SAR-CoV-2 virus spread like a wildfire across Europe and the US, several DEC central banks announced purchases of long-term government bonds. The Bank of International Settlements (BIS) lauded DEC central banks for taking up the role of "dealers of last resort", a role which central banks in many Advanced Economies (AEs) had been playing since the GFC. The bond purchases cooled bond yields, bolstered share prices and slowed exchange rate depreciation in most DECs, to the surprise of many commentators (Arsalan 2020, Benigno et al. 2020). While central banks in Advanced Economies (AEs) had been carrying out QE for about a decade, it was argued that DECs suffered from "debt intolerance"—their threshold for acceptable level of public debt was far lower than for AEs (Mehrotra et al. 2012). Anything resembling monetisation of

sovereign debt was anathema for DECs as it would presumably lead to runaway inflation and a loss of investor confidence in bond markets.

However, it is important to examine whether bond purchases by the RBI qualify as DOLR. DOLR is intended to support collateral prices in market-based finance, where securities, rather than bank loans are the primary instrument for credit creation, and repo liabilities rather bank deposits are the primary liabilities in the financial system. DOLR, thus, explicitly supports credit creation outside the formal banking system. However, due to the RBI's resistance to liberalizing reop markets, government securities are used for collateralised borrowing, not repo financing. In this context, OMOs should be seen as supporting the price of PMAs in bank-based finance, and, in the process de-risking sovereign bonds for carry trade investors, rather than propping up market-based finance. As the government's debt manager, the RBI has always engaged in some form of yield curve control, although never formally committing to target a specific g-sec yield level like central banks in some advanced countries (Gabor 2021). The RBI intervenes in the secondary market through OMOs as well as in the primary market by rejecting bids in auctions. Occasionally, it allows auctions of g-secs to partially devolve on the primary dealers if it feels the yields quoted are high. Moreover, if OMOs are the primary instrument to provide monetary liquidity, yield control cannot be distinguished from routine provision of monetary liquidity. However, in the post-GFC era, the scale and volatility of capital inflows has made the task of yield control more onerous. The Indian central bank should reinstate capital controls to regain control on the creation of monetary liquidity.

8.4 Conclusion

This chapter has chronicled changes to India's Neoliberal monetary liquidity framework in the post-GFC era. The main changes were liberalisation of debt inflows, the adoption of formal inflation targeting and a more hands-off approach to the exchange rate. The trend towards liberalizing debt portfolio inflows had started prior to the GFC, under pressure from the government. Heavy outflows during the GFC and a change of RBI governor accelerated liberalisation after the

GFC. The new RBI governor maintained that capital inflows were required to fill the current account gap and sought to coax the government to reduce its fiscal deficit by dangling capital account liberalisation as a carrot. Liberalizing debt inflows during periods of outflow set up a destabilizing dynamic of ever-increasing debt inflows and sharp outflows. The timing of debt inflows and outflows was decided by the Global Financial cycle rather than India's external financing needs. While Indian policymakers have little control over the Global Financial Cycle, liberalizing debt portfolio inflows amplified the effects of quantitative easing. These policy changes entrenched global dominance of monetary policy, with the RBI grudgingly forced to prop up G-sec prices during periods of debt outflows. If it is reluctant to play the role of buyer of last resort, the Indian central bank should reinstate capital controls rather than reify the trope of fiscal dominance.

The next and final empirical chapter examines the evolution of Pillar 2 of the liquidity regime, which is position-making structure, in the post-GFC era. The easing of funding liquidity conditions due to capital inflows coincided with a bad loans crisis in India's banking sector. As banks cut back on loan-making, non-banking finance companies (NBFCs) stepped in to fill part of the void. The growth of NBFCs was facilitated by new funding liquidity chains between banks, cash pools and NBFCs. However, market-based finance, which is characterised by an intertwining of funding liquidity and market liquidity, did not develop because of the RBI's aversion towards leveraged trading of securities. The growth of NBFCs culminated in the crash of a large NBFC in 2018, which led the RBI to double down again on bank-based finance by moving to bring NBFC regulation more in line with banking regulation.

Chapter 9 The 2010s: The Rise of Non-Bank Lending Without Market-based Finance

On June 22, 2018, a subsidiary of the Indian infrastructure and finance conglomerate IL&FS informed the Bombay Stock Exchange that it had defaulted on commercial paper worth 100 crore rupees ($15 million) due to a logistical issue with transferring the funds. The news did not attract much attention, although rating agencies downgraded the company's commercial paper without assigning it a default rating (Bremner et al. 2018). However, in the following month, IL&FS' long-serving chairperson abruptly stepped down and was replaced by an executive of the state-run Life Insurance Corporation of India, which was IL&FS' largest stakeholder. Over the next few months, the non-bank lender defaulted on a string of banks loans and short-term debt instruments, leading to further downgrades by rating agencies. In September 2018, the Indian government replaced the entire board of directors of IL&FS with its own appointees, effectively taking control of the troubled shadow-banking conglomerate. The finance ministry said the new board would start the process of selling assets and raising equity capital to stabilize the group, whose main line of business was financing infrastructure projects.

The government's actions failed to prevent contagion. IL&FS' defaults roiled India's small but rapidly growing corporate bond market as the group accounted for 3% of outstanding issuances (Mundy and Stacey 2018). In subsequent weeks, other non-bank lenders, known locally as non-banking financial companies (NBFCs), saw their share prices plummet. The sector faced acute funding pressures as banks refused to roll over maturing loans and asset managers dumped bonds and commercial paper issued by NBFCs, leading to a sharp increase in bond yields. To make matters worse, the slowing economy affected repayment of loans made by the NBFCs themselves. Over the next 12 months, a string of NBFCs defaulted on short-term debt instruments (Mulye 2020).

NBFCs had faced a similar liquidity crunch during the Great Financial Crisis (GFC). During the 2009 crisis, the RBI had opened a refinance facility for banks to on-lend to NBFCs, but had not lent to the sector directly nor had it accepted bonds issued by NBFCs as collateral for refinance to banks. During the IL&FS crisis, the RBI took a similar position—it opened a refinance facility for banks to lend to NBFCs, but refused to lend to the sector directly or accepts NBFC debt as collateral. The RBI also rejected the government's request for a "special dispensation" allowing banks to hold off on classifying distressed loans to IL&FS as non-performing (Nair 2019). It, however, agreed to reduce the risk-weight of bank loans to NBFCs.

Unlike the securities scam of the early 1990s, the IL&FS debacle was not a threat to the stability of the financial system as a whole. Banks' exposure to the beleaguered shadow lender was a miniscule percentage of their total assets. The IL&FS episode ended with the group being placed under conservatorship. A few other NBFCs with a reputation for poor corporate governance also collapsed and some asset managed companies closed mutual funds schemes (Economic Times 2022). Higher-rated NBFCs rode out the storm. However, the episode hit India's longstanding ambition of developing a corporate debt market and reducing dependence on bank lending for commercial credit. Since 2015, the banking system, dominated by state-run banks, had been grappling with a sharp increase in bad loans. Successive RBI governors had pointed to poor risk management and corruption in state-run banks as the primary reason for the rise in bad loans[30] . The policy consensus in India was that developing a corporate bond market would subject borrowers to market discipline and improve credit appraisal standards.

This chapter interprets these developments through Pillar 2 of the liquidity regime framework, which focusses on the relationship between funding liquidity of

[30] Former RBI Governor Raghuram Rajan coined the term 'riskless capitalism' (Azad et al. 2014) to refer to the collusion between Indian state-run banks and industrialists that allowed industrialists to walk away from failing companies and loan defaults without any personal repercussions. During his term as governor, he initiated a one-time Asset Quality Review that forced banks to recognize many loans as non-performing. The AQR "shook" the banking sector and led to an increase of 4 percentage points in the gross bad loans ratio of state-run banks between March 2016 and March 2017 (Basu and Moovendhan 2017)

institutions and market liquidity of collateral in different position-making structures (PMS). It argues that the growth of corporate bond market was enabled by the emergence of new funding liquidity chains between banks, mutual funds and NBFCs. However, it did not result in the emergence of market-based finance due to the RBI's justified aversion to leveraged trading and reluctance to support credit creation outside the banking sector during crises. This chapter starts by tracing the growth of NBFCs in the post-GFC era. It then explains how the rise of NBFCs did not constitute a shift towards market-based finance and how the crisis in the NFC sector led the RBI to bring regulation of NBFCs more in line with banks. Finally, it highlights the RBI's unrealistic vision of a market-based financial system that does not involved a repo-focussed PMS or backstops from the central bank.

9.1 The Rise of NBFCs

NBFC is a catch-all term that includes institutions ranging from semi-formal chit funds and collective investment schemes to publicly listed financiers. NBFCs have been a feature of the Indian economy for decades. In the 1990s, the RBI increased its regulatory oversight of NBFCs, creating three separate categories of NBFCs which were subject to different rules—deposit-taking NBFCs[31], non-deposit-taking NBFCs and core investment vehicles (RBI 2011a). As regulations for deposit-taking NBFCs were the most stringent, the number of deposit-taking NBFCs fell sharply in the 1990s and the early 2000s. While the RBI is wary of deposit-taking NBFCs, it is much more encouraging of non-deposit-taking NBFCs, seeing them as serving "niche" areas and being more "flexible and borrower-friendly than banks" in poor and rural areas (RBI 2011a). As the NBFC sector grew rapidly in tandem with the banking sector in the 2000s, the RBI, in 2006, created a separate 'systemically important' category for non-deposit-taking

[31] The deposits were in the nature of fixed-term deposits, unlike checking account deposits offered by banks.

NBFCs with assets of more than 1 billion rupees. These NBFCs were subject to more stringent capital and liquidity regulations.

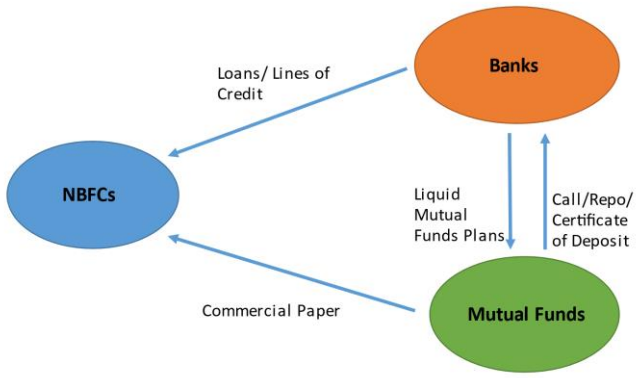
NBFCs rely on a mix of bank loans, bond issuances and commercial paper for funding. During the GFC, private-sector banks saw deposits flee to state-run banks, and in turn refused to roll over loans to NBFCs. Mutual funds, which were large investors in commercial paper of NBFCs, also faced redemption pressures. Consequently, the RBI came under pressure to open a special liquidity facility for NBFCs (Acharya et al. 2013). However, the RBI refused to lend to NBFCs directly, citing laws that barred it from lending to most categories of non-banks. Instead, it opened a special refinance facility for banks to on-lend to NBFCs. The refinance facility failed to serve its purpose as banks were unwilling to increase their exposure to NBFCs. Ultimately, the government was forced to step in to guarantee NBFC debt as the RBI was unwilling to take on the credit risk of NBFCs on its own books. A state-owned bank set up a special purpose vehicle, which issued government-guaranteed securities that were purchased by the RBI. The vehicle, in turn, bought short-term debt issued by the NBFCs (RBI 2009). The liquidity crunch alerted the RBI to fragility of the wholesale funding model of NBFCs. The central bank was also concerned about knock-on effect of the potential failure of NBFCs on the banking sector on banks. In 2011, an RBI committee tasked with reviewing NBFC regulation, recommended, among other measures, a liquidity coverage ratio for NBFCs.

As NBFCs and mutual funds recovered after the GFC, the RBI became increasingly concerned about the circular flow of funds between banks and NBFCs and the continued reliance of NBFCs on mutual funds for funding. The RBI's first Financial Stability reported released in 2010 noted that mutual funds were large lenders in the unsecured overnight market, where banks were large borrowers. On the other hand, banks had stepped up investments in liquid mutual funds to benefit from higher returns, lower taxes and easy redemption.

> Such circularity in movements of funds poses potential risk to the financial system. Liquidity risk resides in such mutual funds since their liabilities are withdrawable virtually on demand whereas the investments are for longer periods (RBI 2010, p.31)

The same report expressed concern that NBFCs remained dependent on short-term instruments such as commercial paper and intercorporate deposits, which were heavily subscribed by mutual funds. The issue of circular flow of funds between banks, mutual funds and NBFCs was repeatedly flagged in subsequent Financial Stability Reports. Figure 9.1 illustrates the new funding liquidity chains between banks, mutual funds and NBFCs.

Figure 36. New Funding Liquidity Chains

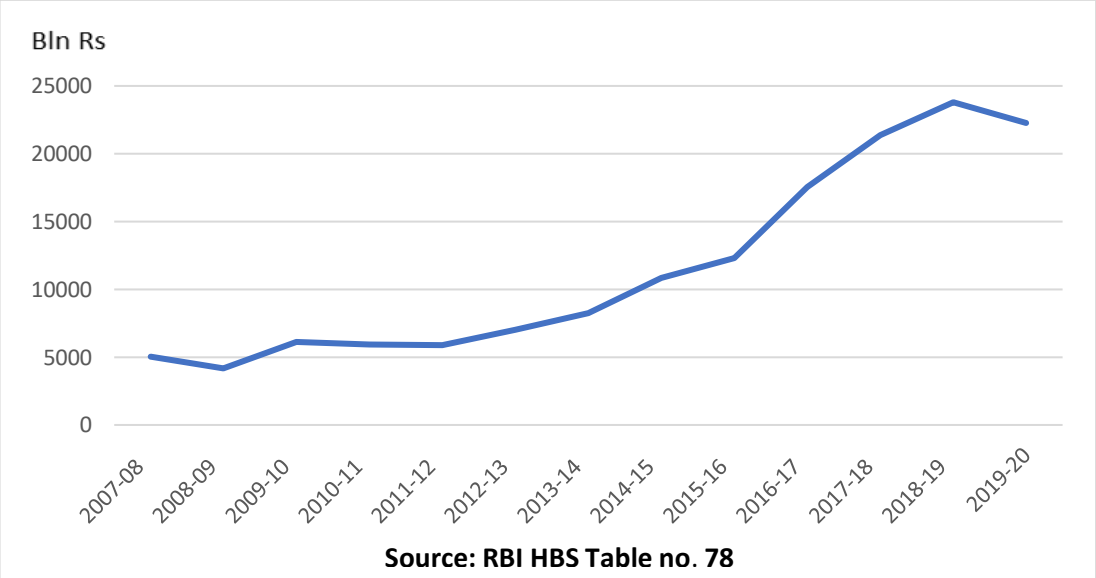


In July 2011, the RBI placed limits on banks' investments in liquid schemes of debt mutual funds. Mutual funds were required to mark to market all money market instruments of residual maturity of more than 91 days. However, this resulted in a spurt of issuances of commercial paper and certificates of deposits of less than three months (RBI 2011b).

After dipping during the GFC, assets under management of mutual funds were relatively flat for a few years before picking up from 2012-13 onwards (see Fig. 9.2). However, the spurt in assets under management came after Indian Prime Minister Narendra Modi in November 2016 outlawed the use of nearly 86% of

India's currency notes by value—an exercise which came to be known as demonetisation. Consequently, banks were flooded with deposits as the public rushed to deposit the outlawed currency notes. As bank deposits rates fell sharply, investments in mutual funds jumped as investors sought higher returns. Between 2015-16 and 2018-19, assets under management of mutual funds doubled.

Figure 37. Assets under Management of Indian Mutual Funds

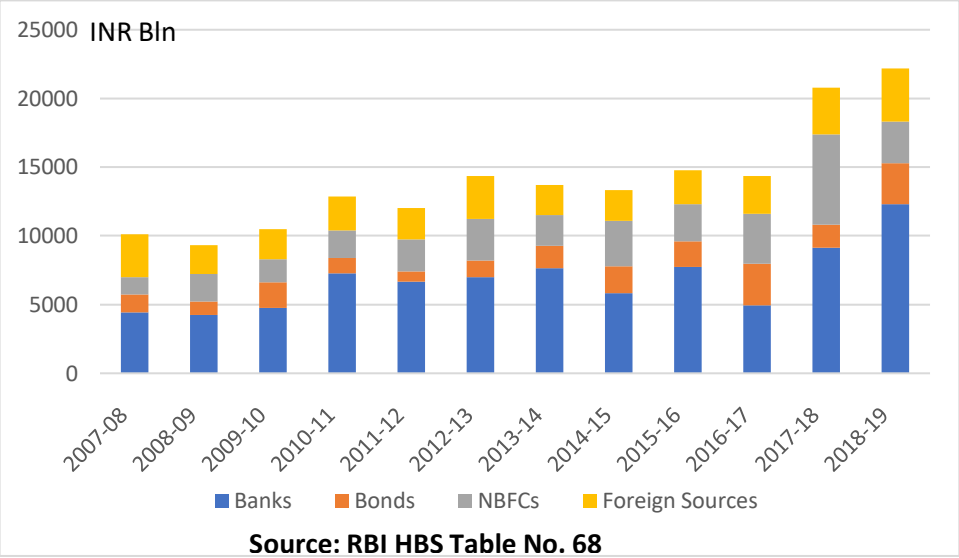


Source: RBI HBS Table no. 78

At the same time, banks were struggling with a growing pile of bad loans. Concerned that banks were underreporting bad loans, RBI Governor Raghuram Rajan in December 2015 initiated an Asset Quality Review of the banking sector, which led to sharp increase in recognition of bad loans. Between 2013-14 and 2017-18, gross non-performing assets as a percentage of total advances rose from 3.8% to 11.2%. Banks cut back on new loans at a time when liquidity was abundant due to demonetisation and the RBI's FX interventions. As liquidity was abundant, bond issuances by corporations increased significantly in 2016-17 (see Fig. 38). In its Financial Stability report for the first half of 2016, the RBI noted that "amidst sluggish bank credit growth, capital markets seem to be supporting the needs of the commercial sector" (RBI 2016). However, the central bank was concerned by

the increase in short-term debt instruments and that most bonds were issued on a "private placement" basis to investors rather than listed on exchanges.

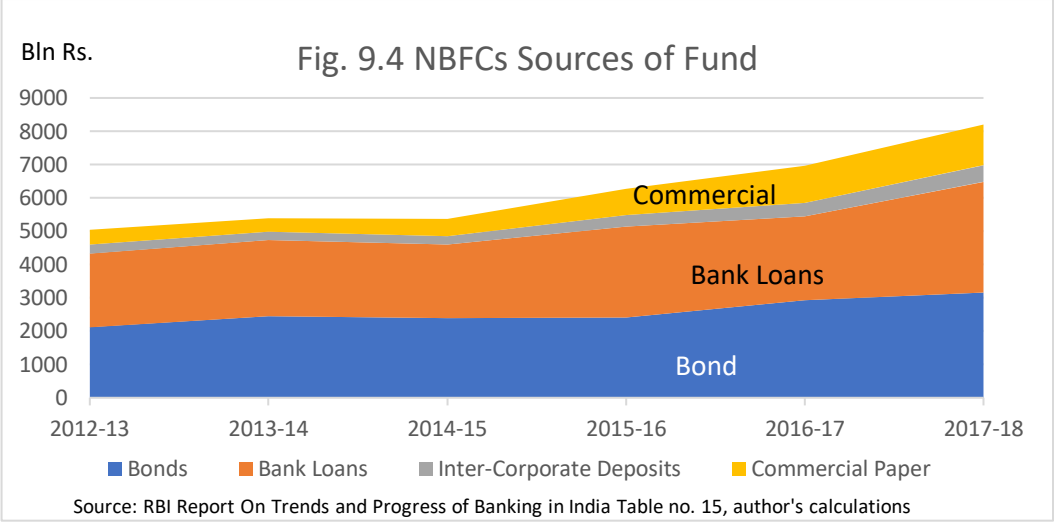
Figure 38. Sources of Credit to Commercial Sector



Source: RBI HBS Table No. 68

NBFCs also picked up some of the slack, with their share in total commercial credit rising significantly between 2015-16 and 2017-18 (see Fig. 9.3). At the peak, the share of NBFC is commercial credit rivalled the banking sector, before falling sharply in 2018-19 after the IL&FS collapse.

Figure 39 Sources of Funds of NBFCs



However, even as commercial paper issuances grew after 2015, bank loans and bonds, most of which were held to maturity, remained the main sources of funding for NBFCs (Bank Official No. 5).

To summarize, in the build-up to the collapse of IL&FS, the share of NBFCs in total commercial credit rose significantly. NBFCs benefitted from an increase in loans from banks and could also issue more commercial paper amid easy funding liquidity conditions due to capital inflows and demonetisation. Mutual funds were large investors in commercial paper issued by NBFCs.

9.2 Why NBFCs were Not Shadow Banks

This thesis argues that the rise of NBFCs in India and the growth of the corporate bond market did not portend a shift to market-based finance from bank-based finance. Instead, it was an offshoot of bank-based finance, featuring new funding liquidity chains between banks, mutual funds and NBFCs.

As Acharya et al. (2013) point out, NBFCs in India do not play the same role as shadow banks in market-based finance. Shadow banks in market-based finance are involved in the creation of private-sector safe assets through securitization as well as in "collateral intermediation" (Claessens et al. 2012). Collateral intermediation "involves the intensive re-use of scarce collateral, so that it supports as large as possible a volume of financial transactions" (Claessens et al. 2012, p. 14). Collateral intermediation underpins the dealer-bank business model

which characterizes market-based finance as elaborated in chapters 3 and 5, a model which relies on "high leverage, procyclical businesses, and unstable, uninsured wholesale funding" (Claessens et al. 2012, p. 24). India's financial system did not exhibit either feature of shadow banking—private-sector safe assets or collateral intermediation. Although NBFCs in India securitize some of their loans, there is no secondary market for securitized assets (Bank Official No. 5). To be sure, private-sector safe assets are not necessary for market-based finance, as chapter 5 pointed out. However, due to the RBI's aversion to leveraged trading of debt securities, collateral intermediation of government securities is not a prominent feature of India's financial system either.

The fragility of the NBFC model was apparent to the RBI, as successive Financial Stability Reports and other RBI publications show. It took steps to reduce banks' exposure to NBFCs. When the crisis broke, the RBI responded to the NBFC crisis in classic Minskyian fashion. It chose to not use its lender of last resort power, allowing some NBFCs and mutual funds to fail while ensuring banks had sufficient funding liquidity. It refused pressure to lend to NBFCs directly or widen its collateral framework to include NBFC assets.

The next section examines the institutional context in which non-bank lending emerged, highlighting the debates in the RBI about the role of commercial banks and the central banks in the proposed shift towards market-based finance.

9.3 The Quest for, And Resistance to, Market-Based Finance

Prior to the economic reforms of the 1990s, state-backed development finance institutions (DFIs) were the primary source of long-term funding for industry. DFIs received funds from the government budget, issued government-guaranteed bonds and also had access to RBI refinance. Following the reforms, the Indian government gradually reduced for supported for DFIs, which eventually merged with or converted to commercial banks. Indian policymakers hoped that a deep and liquid corporate bond market would fill the gap left by DFIs. Since 2005, several official committees have made recommendations to develop the corporate

bond markets[32]. In my conversation with commercial bank executives and former RBI officials, the consensus was that most of the logistical issues to do with market infrastructure, tax treatment and clearing and settlement have been fixed over the years. The sticking point was the question what role should banks, and by extension, the central bank, play in the corporate bond market, which was a point of intense debate. The RBI initially believed it was important to ensure that the "process of disintermediation away from banks is genuine" (RBI 2010, p. IV). It was not prepared to allow banks to guarantee corporate bonds. A key reason why the corporate bond market did not develop is "people wanted a credit enhancement from a bank. But banks were not expected to do credit enhancement and we didn't want them to do that" (RBI Official No. 4). The RBI was perpetually wary of covert bank guarantees in new financial products.

> It's exactly like what happened during the financial crisis, lot of investments into these derivative products, all these innovations will happen—structured products and somewhere you will find there is a bank guarantee. Might not be direct but some vehicles or some other manner you will find some bank guaranteeing or through some derivative they have provided credit risk protection. … It is very important that if we really want to reduce the dependence on banks, diversify the risk, we have to ensure that the risk really gets diversified. Otherwise, it will happen like the crisis, where ultimately the bank has to be bailed out. (Bank Official No. 4)

However, as bad loans started piling up at banks from 2014 onwards, the pressure to develop the corporate bond market increased. From 2015 onwards, several steps were taken to promote the corporate bond market. The RBI was persuaded to dial back its reluctance towards the banking system providing credit backstops to corporate bonds. In 2015, it allowed banks to guarantee up to 20% of a single bond issue, with separate exposure limits for individual banks. A year later, it raised the limit to 50% from 20%. In the same year, India's Parliament passed the Insolvency and Bankruptcy Code 2016, an ambitious piece of legislation aimed at speeding up bankruptcy resolution in a historically debtor-friendly set-up. The legislation decreed the establishment of a government-appointed Insolvency and Bankruptcy

[32] These include The High Level Committee on Corporate Bonds and Securitization 2005 (Chair: R.H. Patil), the RBI Working Group on Development of Corporate Bond Market in India (Chair: H.R. Khan).

Board to oversee insolvency resolution and set a deadline of 180 days for corporate bankruptcy resolution. It was hoped that the prospect of swift insolvency resolutions would make corporate bonds more attractive to investors. In 2017, the Securities and Exchange Board of India stipulated that a minimum 25% of incremental borrowings of large corporations would have to be through bond issuances. A year earlier, a RBI committee headed by a former deputy governor recommended that the central bank accept corporate bonds as collateral for its monetary liquidity operations to increase market liquidity of corporate bonds. The suggestion was controversial. Several former RBI officials I spoke to were opposed to the RBI providing credit and liquidity backstops to the private sector debt. Other officials opined that it was the only way to encourage market-making in corporate bonds and increase market liquidity.

> If a market maker is looking for one thing it is a backstop. If I am getting stuck because of my market-making, I need to have a backstop. So, who provides a backstop in this country? So, one thing we have deliberated a lot in the RBI but there were complete opposing views was should RBI be providing some sort of backstop, maybe a small percentage of repo against corporate bonds? What risks does the RBI run?... Ultimately people will lose interest because nobody wants to invest in an instrument where you cannot get out when you need liquidity. (RBI Official No. 4)

However, the RBI's response to IL&FS' failure made clear its present position on the subject. The RBI would not act as lender of last resort to non-banks and neither would it backstop collateral issued by the private sector. It would make refinance available to banks to on-lend to NBFCs but it would not take the credit risk of non-bank firms on its own books. Since market-based finance based on private-sector collateral requires both credit and liquidity backstops from the banking system and by extension the central bank, it is unlikely that a system of private-sector safe assets will develop without credit and liquidity backstops from the banking system.

In the wake of the IL&FS crisis, it is unclear which direction India's financial system will take. The policy consensus in India is in favour of capital account liberalisation which has entrenched global dominance of monetary policy. Volatile capital flows have also turned the RBI into a buyer of last resort of government

bonds and an enabler of carry trading by foreign investors. On the other hand, the RBI, at least for the moment, seems reluctant to backstop private-sector collateral or relax restrictions on leveraged trading of debt securities by, for instance, allowing more central counterparties to break the monopoly of CCIL.

The RBI's vision of market-based finance is unrealistic and ignores the key features of market-based finance, which is a repo-focussed position-making structure and central bank support for credit creation outside the banking system. The RBI appears to be justifiably uncomfortable with both features. Market-based finance is fragile and carries substantial risk that need to be appreciated, as the Minskyian and CMF literatures point out. Give the experience of advanced economies with market-based finance, it is unclear why India is seeking to emulate them. Instead of market-based finance, Indian policy-makers should focus on strengthening bank-based finance.

9.4 Conclusion

This chapter examined the evolution of India's position-making structure in the post-GFC era, using the collapse of a non-bank lender and the regulatory response to it as a focal point. It placed the rise of non-bank lending in context of easy funding liquidity conditions due to capital inflows even as banks were struggling with a rise in bad loans. At the same time, the RBI was unwilling to expand its collateral framework to include private-sector assets or relax its stance on the leveraged trading of debt securities. Consequently, the system of non-bank lending, which has been a part of India's financial system for decades, grew. However, this system was not market-based finance, as it depended on funding liquidity from banks rather than market liquidity of collateral. The RBI's response to the crisis made it clear that it was not prepared to bail out non-banks or protect collateral issued by the private sector.

It is unclear which direction India's financial system will take in the aftermath of the IL&FS crisis. Indian policymakers seem intent on moving away from bank-based finance but it is not clear what they want to move towards. It has been a long-standing desire of India and other DECs to develop deep and liquid corporate

bond markets, without an appreciation of what it entails. This thesis sought to shine a light on this question by the introducing the analytical tools of deposit-focussed PMS and repo-focussed PMS. Position-making in the former is geared to ensure funding liquidity of banks, while in the latter, the purpose of position-making is to facilitate leveraged trading of collateral. The RBI is, justifiably, wary of repo-focussed PMS, as reflected in its attitude towards leveraged trading of collateral and lending to non-banks during crises. However, the RBI is also in favour of capital account liberalisation, which reduces its influence over credit creation in the economy and makes it more difficult to regulate bank-based finance. This thesis argues that the RBI's vision of market-based finance is unrealistic. It does not consider that market-based finance is undergirded by leveraged trading of collateral and central bank support for credit creation outside the banking system, both features that the RBI appears to be uncomfortable with. Instead of aspiring for market-based finance, whose fragilities have been well-studies, Indian policy makers should instead strengthen bank-based finance.

Conclusion

This thesis started as a project to examine the Reserve Bank of India's role in shaping the country's somewhat unique trajectory of financialisation. However, early in the project I became interested in the fall-out of a securities market Scam in the early 1990s, which had instilled a fear of leveraged trading of debt securities in the RBI. The RBI seemed prepared to accept less liquid debt markets as a cost of restricting leverage even as it nursed ambitions of moving India from a bank-based to a market-based financial structure, which is premised on liquid debt markets. At the same time, it had adopted inflation targeting as its monetary policy, shaping liquidity conditions in the debt market. I became interested in the dissonance between the central bank's monetary policy and its approach to leveraged trading, and how the tension between the two had shaped India's financial structure. Accordingly, the focus of this thesis broadened from the role of the central bank in financialisation to the role of the central bank in all facets of liquidity production ranging from supplying reserves as part of monetary policy operations, framing rules on trading in debt markets and regulating the banking sector. The problematique of this thesis became to examine the role of the central bank in shaping the institutional apparatus of liquidity production in both market-based and non-market-based finance.

Building on Pape (2020), this thesis conceptualized a liquidity regime as a set of balance sheet relationships between the various entities involved in liquidity production. The thesis committed to illustrating the balance sheet transformations involved in liquidity production in each financial structure as well as the evolution of these balance sheet relationships resulting from financial innovation and policy changes. The theoretical scaffolding of a liquidity regime draws on the three different ways in which scholars have interpreted the concept of liquidity—monetary liquidity (bank reserves), funding liquidity (ease of accessing cash) and market liquidity (ease of buying or selling an asset). Accordingly, a liquidity regime

was theorized as consisting of two pillars–the monetary liquidity framework and the funding liquidity-market liquidity nexus. These two pillars correspond to the mechanisms used by a central bank to create reserves, on the one hand, and the rules for how financial institutions are permitted to use collateral in the money market, which ultimately determines a country's financial structure. While these two pillars interact, they also evolve independently. It is not always possible to infer a country's financial structure from its monetary liquidity framework, and vice versa.

The first pillar corresponds to how central banks create monetary liquidity, and is shaped by the monetary-fiscal nexus, capital account policy and exchange rate policy. Drawing on Epstein (2006), it conceptualized the monetary liquidity framework as being one of two types–Developmental, which is characterised by deficit monetisation, capital controls and a fixed exchange rate and Neoliberal, which features inflation targeting, capital account liberalisation and floating or managed exchange rates. Through balance sheet analysis, this thesis showed how a Developmental monetary liquidity framework exhibits fiscal dominance of monetary liquidity creation, while in a Neoliberal framework capital flows determine the creation of monetary liquidity. The second pillar of a liquidity regime corresponds to the link between funding liquidity of financial institutions and market liquidity of collateral in the money market. To examine how this relationship operates in different financial structures, the thesis develops the concept of position-making structures, which build on Minsky's concept of position-making—the act of acquiring cash to finance essential assets. A position-making structure represents the wiring of the money market, and is of one of two types, depending on whether the purpose of the money market is to meet cash demands primarily arising from bank deposits issued in the process of making loans or financing foreign-currency inflows (deposits-focussed position-making) or to enable the financing of securities by issuing repo liabilities (repo-focussed position-making). Central bank policy restricts leveraged trading of collateral in the former, but not in the latter. A deposits-focussed PMS is the money-market configuration for bank-based finance where bank loans are the main type of

essential assets and bank deposits are the main type of liabilities. Funding liquidity of banks does not depend on market liquidity of collateral because of the presence of mechanisms such as central bank refinance, and the use of face value or model price of securities for collateralised borrowing with illiquid securities. During crises, central bank provision of monetary liquidity as a lender of last resort is sufficient to restore funding liquidity of banks. On the other hand, a repo-focussed PMS, enables the financing of securities on the money market through the issuance of repo liabilities, which are the main types of liabilities in market-based finance. During crises, provision of monetary liquidity to the banking sector is not enough as repo rather than bank deposits are the main form of liabilities in the financial system. Restoring funding liquidity of banks does not translate into market liquidity of the collateral standing behind repos. Central banks must become dealers of last resort by buying financial assets directly to restore market liquidity of collateral. Central bank backstops for credit creation outside the banking system are, thus, essential in market-based finance.

This theoretical framework was deployed to the empirical terrain of India. The empirical section chronicles the evolution of India's monetary liquidity framework and position-making structure following the economic reforms of the early 1990s. Following the Balance of payments of crisis, India shifted from a Developmental to a Neoliberal monetary liquidity framework. The RBI attacked deficit monetisation with a zeal, and also embarked upon gradual capital account liberalisation, believing it could manage the risks. However, its framing of capital flows into local-currency assets as benign made it difficult for it to resist pressure from the government to liberalize inflows, setting the stage for global dominance of monetary policy.

A few months after the balance of payments crisis, a repo-focussed PMS that had developed in the shadows of the deposits-focussed PMS erupted in a Scam. The Scam prompted the RBI to beef up its regulatory powers over the banking sector and restrict leveraged trading of collateral, which had been at the centre of the Scam, in effect strengthening bank-based finance. The Scam led the RBI to double down on bank-based finance.

Following the Great Financial Crisis, capital account liberalisation intensified, leading to a surge of inflows due to Quantitative Easing, entrenching global dominance of monetary policy. The volatility of capital flows turned the RBI into a buyer of last resort in government securities and de-risker for carry trade investors. At the same time, Indian banks were struggling with rising bad loans, and policymakers were taking steps to promote market-based finance, such as allowing banks to guarantee a certain percentage of corporate bod issuances. However, due to the RBI's reluctance to allow leverage trading of debt securities or take up the mantle of dealer of last resort in private-sector assets, market-based finance failed to take hold in the country. Instead, a non-bank lending system which depended on funding liquidity from banks rather than market liquidity of collateral grew. When a large non-bank lender failed and caused a funding crisis, the RBI refused to bailout the sector, indicating its discomfort with providing the credit and liquidity backstops to the non-bank sector that are a pre-requisite of market-based finance.

The empirical narrative highlights the difference in the RBI's approach to monetary liquidity and to the wiring of the money market, and thus the financial structure. In the former, the RBI has adopted nearly all the aspects of Neoliberal central banking, while in the latter, it has behaved in Minskyian fashion, using its lender of last resort powers judiciously and resisting the development of fragile market-based finance. This thesis argued that the RBI's vision of market-based finance is unrealistic and ignores its key features, such as repo-focussed position-making and credit and liquidity backstops from the central bank, which the RBI seems justifiably unwilling to provide. Instead of aspiring for market-based finance Indian policymakers should focus on strengthening bank-based finance. As a first step, it should bring in place restrictions on capital flows that destabilize bank-based finance.

Contributions of the thesis

On the **theoretical** front, this thesis aimed to extend the field of critical macrofinance to non-market-based finance. It developed the concept of position-

making structures to analyse the funding liquidity-market liquidity nexus in different financial structures. The concept of PMS helps clarify the link between money market configurations and their respective financial structures. It shows how the purpose of the money market differs depending on the nature of the liabilities to be financed in a particular financial structure. This thesis also argued for an analytical separation between monetary liquidity mechanisms and position-making structures, arguing that both can evolve independently. A monetary liquidity framework captures the balance sheet activities of the central bank. However, through its regulatory powers, the central bank also shapes the rules on how other institutions can use their balance sheets in the money market, which in turn influences the broader financial structure. A framework that only focusses on how the central bank uses its balance sheet for creation of monetary liquidity does not capture this aspect of central bank influence on liquidity production. The analytical separation between monetary liquidity and position-making structures enables the study of idiosyncratic financial systems such as India, where the central bank has been following a Neoliberal approach to monetary liquidity and a Minksyian approach to the position-making structure.

Secondly, this thesis highlights the potential of balance sheet analysis as a theoretical device in the Minskyian tradition as an alternative to formal mathematical modelling. Balance sheet analysis is used to show how capital flows result in an increase in deposit creation due to settlement dynamics of cross-border transactions. This deposit creation increases the demand for monetary liquidity from the central bank and reduces its control over credit conditions irrespective of whether the inflows are sterilized. This thesis also uses balance sheet analysis to show the working of deposits-focussed and repo-focussed position-making structures.

On the **empirical** front, this thesis tells a nuanced story of the evolution of the liquidity regime in India, as an alternative to the RBI's rosy narrative of its macrofinancial management. It highlights the policy mistakes of the RBI, such as its ideological imperative to end deficit monetisation at all costs and to view capital

inflows, especially those that don't cause currency mismatches, as benign. It also highlights the policies of the RBI that were correct. These include:

a) Its insistence that sovereign debt management remain the RBI, and its refusal to use its role as sovereign debt manager to discipline the RBI even as it voiced its opposition to what it viewed as fiscal dominance of monetary policy.

b) Its early use of macroprudential regulation as a tool of central banking.

c) Its aversion to leveraged trading of securities, and success in creating a central counterparty for transactions in government securities and a trade repository, allowing it monitor leverage in the money market.

d) It's refusal to provide backstops to credit creation outside the banking system.

On the **policy** front, this thesis speaks to contemporary debates about macrofinancial policy in DECs. It complements the Critical Macrofinance literature problematizing the ambition of many DECs to move from bank-based finance to market-based finance by shining a spotlight on what market-based finance entails. When market-based finance is reframed as consisting of leveraged trading of debt securities, and an expanded role for the central bank as dealer of last resort, it becomes less appealing, as has been the case in India.

This thesis also speaks to debates about sovereign debt management in DECs. It shows that in their enthusiasm to end fiscal dominance of monetary policy, DEC central banks embraced global dominance of monetary policy by liberalizing capital flows. The issuance of sovereign bonds in DECs has become increasingly divorced from the borrowing needs of governments. This is not to say that DECs do not face fiscal constraints. Both monetisation of government bonds and monetisation of FX assets result in the creation of monetary liquidity. Excessive creation of monetary liquidity could lead to financial instability and speculative bubbles. However, global dominance means monetary conditions in the core economies determine creation of monetary liquidity. Central banks presumably have less

influence over monetary conditions in the core than they do over their own governments.

On the **methodology** front, the thesis shows the potential of grounded theory as a methodology of economics. It also highlights the role of semi-structured key-informant interviews as a source of primary data, especially in the absence of archival material. Unstructured or semi-structured interviews, which are relatively rare in economics, were used both for theory building and for the empirical narrative in this thesis.

Avenues of Further Research

Based on the theoretical,, empirical and methodological contributions of this thesis three avenues of further research emerge.

Firstly, while many of the policy insights of this thesis may not apply to other DECs due to structural and institutional differences in their financial structures, the liquidity regime framework can be applied to study how central banks shape liquidity production in other DECs. The framework has the analytical breadth to accommodate a wider array of institutional configurations and market practices than frameworks that simply focus on the balance sheet activities of central banks.

Secondly, the nature of market-based finance in DECs is another avenue of research. Current conceptualizations of market-based finance draw on the template of U.S. repo markets. Due to the institutional differences between DECs and AEs and their subordinate position in currency hierarchies, market-based finance in DECs might have different features and evolve in a distinctive fashion, compared to market-based finance in AEs.

The third avenue of research is on the political economy of banking and financial regulation in India. As the power of the central bank to regulate the financial sector is key to the stability of bank-based finance, the political economy of financial regulation is an interesting topic of research. A question that emerged during my research is how the RBI was able to salvage its reputation after being caught

napping at the wheel in the Scam of 1992. It emerged with more regulatory powers and a greater say in the Indian economy than before, and is one of the most respected public institutions in India today. Another interesting research question in this strand is on the longevity of state-run banks in India, despite repeated attempts and ongoing efforts by the government to privatize them. State-run banks, with their large holdings of government securities and reluctance to trade actively, could be a key bulwark against the development of market-based finance. The continued dominance of sate-run banks in India may be a natural bulwark against the development of market-based finance.

(Word count: 53,932)

References

Acharya, V. (2020). *Quest for Restoring Financial Stability in India* (Kindle Edition ed.). New Delhi: Sage Publications.

Acharya, V.V., Khandwala, H., and Sabri Öncü, T. (2013). The Growth Of A Shadow Banking System In Emerging Markets: Evidence from India. *Journal of International Money and Finance*, 39, 207-230.

Acharya, V. V., and Kulkarni, N. (2012). What Saved the Indian Banking system: State Ownership or State Guarantees? *The World Economy*, 35(1), 19-31.

Acharya, V. V., Schnabl, P., and Suarez, G. (2013). Securitization without Risk Transfer. *Journal of Financial Economics*, 107(3), 515-536.

Adrian, T., and Fleming, M. J. (2005). What Financing Data Reveal About Dealer Leverage. *Current Issues in Economics and Finance*, 11(3), 1.

Adrian, T. and Shin, H.S. (2009). The Shadow Banking System: Implications for Financial Regulation. *Banque de France Financial Stability Review*, 13, 1-10.

Adrian, T., and Shin, H. S. (2010). Liquidity And Leverage. *Journal of Financial Intermediation*, 19(3), 418-437.

Ahluwalia, M. S. (2002). Economic Reforms In India Since 1991: Has Gradualism Worked? *The Journal of Economic Perspectives*, 16(3), 67-88.

Ahluwalia, M. S. (2019). India's Economic Reforms: Achievements And Next Steps. *Asian Economic Policy Review*, 14(1), 46-62.

Alami, I. (2019). Post-Crisis Capital Controls in Developing and Emerging Countries: Regaining Policy Space? A Historical Materialist Engagement. *Review of Radical Political Economics*, online first.

Allen, F., Bartiloro, L., Gu, X., and Kowalewski, O. (2018). Does economic structure determine financial structure? *Journal of International Economics*, 114, 389-409.

Antipa, P., and Bignon, V. (2018). Whither Economic History? Between Narratives and Quantification. *Observations Et Diagnostics Économiques.Revue De l'OFCE*, 157(3), 17-36.

Arslan, Y., Drehmann, M. and Hofmann, B. (2020). Central Bank Bond Purchases In Emerging Market Economies*, BIS Bulletin No. 20*, Bank of International Settlements.

Asian Security Industries and Financial Markets (2013). India Bond Market Roadmap. Available at http://www.asifma.org/uploadedFiles/News/ASIFMA%20-India%20Bond%20Market%20Roadmap%20Draft_wCover.pdf

Azad, R., Bose, P., and Dasgupta, Z. (2017). 'Riskless Capitalism' In India: Bank Credit And Economic Activity. *Economic and Political Weekly*, 52(31), 85-98.

Azad, R., and Das, A. (2013). Inflation targeting in developing countries: Barking up the wrong tree. *Economic and Political Weekly*, 48(41), 39-45.

Baker, A. (2013). The New Political Economy of the Macroprudential Ideational Shift. *New Political Economy*, 18(1), 112-139.

Baldacci, E., Gupta, S., and Mati, A. (2013). Political and Fiscal Risk Determinants of Sovereign Spreads in Emerging Markets. *Review of Development Economics*, 15, 251-63

Bagehot, Walter. (1873). *Lombard Street: A Description Of The Money Market*. London: Henry S. King & Co.

Balima, W. H., Combes, J., and Minea, A. (2017). Sovereign Debt Risk In Emerging Market Economies: Does Inflation Targeting Adoption Make Any Difference? *Journal of International Money and Finance*, 70, 360-377.

Ban, C., and Gabor, D. (2016). The Political Economy Of Shadow Banking. *Review of International Political Economy*, 23(6), 901-914.

Ban, C., and Gallagher, K. (2015). Recalibrating Policy Orthodoxy: The IMF Since The Great Recession. *Governance (Oxford)*, 28(2), 131-146.

Bandyopadhyay, T. (2017). The Untold Story Of India's Bond Market. *Mint*, 7th April. Available at https://www.livemint.com/Opinion/Z0Q0liYWqfgUjVYMOHhubL/The-untold-story-of-Indias-bond-market.html

Basole, A., and Ramnarain, S. (2016). Qualitative And Ethnographic Methods in Economics. In F. S. Lee, and B. Cronin (Eds.), *Handbook Of Research Methods And Applications In Heterodox Economics* (135-164). Cheltenham: Edward Elgar.

Basu, S., and Moovendhan, V. (2017). Were public sector banks victimised through AQR. *Economic And Political Weekly*, 52(12), 25-46.

Basu, D., and Dalal, S. (2014). The Scam: From Harshad Mehta To Ketan Parekh (Kindle Edition ed.). Mumbai: KenSource.

Benigno, G., Hartley, J., Garcia-Herrero, A., Rebucci, A., and Ribakova, E. (2020. Credible Emerging Market Central Banks Could Embrace Quantitiatve Easing To Fight Covid-19. *VoxEU.Org*. Jun 29.

Bernanke, B. (2005). The Global Saving Glut and the U.S. Current Account Deficit," Speech 77, Board of Governors of the Federal Reserve System (U.S.).

Bewley, T. (2002). Interviews As A Valid Empirical Tool In Economics. *The Journal of Socio-Economics*, 31(4), 343-353.

Bhagwati, J. N., (1993). *India in Transition: Freeing the Economy*. New York: Clarendon Press.

Bhattacharya, S., Arnoud W. A. Boot, and Thakor, A. V. (1998). The Economics Of Bank Regulation. *Journal of Money, Credit and Banking*, 30(4), 745-770.

Bhattacharya, S., and Thakor, A. V. (1993). Contemporary Banking Theory. *Journal of Financial Intermediation*, 3(1), 2-50.

Bhattacharyya, I., Roy, M., Joshi, H., and Patra, M. D. (2009). Money Market Microstructure And Monetary Policy: The Indian Experience. *Macroeconomics and Finance in Emerging Market Economies*, 2(1), 59-77.

Bhattacharya, S., Goodhart, C.A.E., Tsomocos, D., P. and Vardoulakis, A., P. (2015). A Reconsideration of Minsky's Financial Instability Hypothesis. *Journal of Money, Credit and Banking*, 47 (5).

Bindseil, U. (2004). *Monetary Policy Implementation: Theory-Past-Present*. Oxford: Oxford University Press.

Bindseil, U. and Jablecki, J. (2011). A Structural Model of Central Bank Operations and Bank Intermediation. *ECB Working Paper No. 1312*, European Central Bank.

Blanchard, O. J., (1984). Current and anticipated deficits, interest rates and economic activity. *European Economic Review*, 25(1), 7-27.

Blinder, A. (1983). On The Monetization Of Deficits. In L. H. Meyer (Ed.), *The Economic Consequences Of Government Deficits* (39-73). The Netherlands: Springer.

Bloomfield, A., I. (1957). Some Problems of Central Banking in Underdeveloped Countries. *The Journal Of Finance*, 12(2), 190-204.

Bofinger, P. and Wollmershäuser, T. (2003). Managed Floating as a Monetary Policy Strategy. *Economics of Planning* 36(2), 81– 109.

Bonizzi, B. (2013). Financialization in Developing and Emerging Countries. *International Journal of Political Economy*, 42(4), 83-107.

Bonizzi, B., and Kaltenbrunner, A. (2020). Critical Macro-Finance, Post Keynesian Monetary Theory And Emerging Economies. Finance and Society, 6(1), 76-86.

Bordo, M. D. (1989). The Lender of Last Resort: Some Historical Insights. *NBER Working Paper No. 3011*, National Bureau of Economic Research.

Borio, C. (1997). The Implementation Of Monetary Policy In Industrial Countries: A Survey. *BIS Economic Papers*, 47. Bank for International Settlements.

Borio, C. (2018). On Money, Debt, Trust And Central Banking. Paper presented at the Cato Institute for the 36th Annual Monetary Conference. Washington DC, 15 November.

Borio, C. (2019). A Tale Of Two Financial Cycles: Domestic And Global. Lecture at University of Zürich. BIS Speeches. Bank of International Settlements.

Borio, C., and Disyatat, P. (2011). Global Imbalances And The Financial Crisis: Link Or No Link? *BIS Working Papers*, 346. Bank for International Settlements.

Bowen, G.A. (2009). Document Analysis as a Qualitative Research Method. *Qualitative Research Journal*, 9(2), 27-40.

Bowman, A., Erturk, I., Froud, J., Johal, S., Leaver, A., Moran, M., et al. (2013). Central bank-led capitalism? *Seattle University Law Review*, 36(2), 455.

Bracarense, N. (2013). Economic Development In Latin America And The Methodenstreit: Lessons From History Of Thought. *Journal of Economic Issues*, 47(1), 113-134.

Bremner, B., Joshi, A., and Sanjai, P. R. (2018). How Credit Ratings Agencies Missed The IL&Fs Crisis. *Bloomberg News*, 28th September. Available at https://www.livemint.com/Companies/kDBrz7DB4Ti4Pz2TdxG85N/How-credit-rating-agencies-missed-the-ILFS-crisis.html

Brunnermeier, M. K., and Pedersen, L. H. (2009). Market Liquidity And Funding Liquidity. *The Review of Financial Studies*, 22(6), 2201-2238.

Bruno, V., and Shin, H. S. (2015). Cross-Border Banking And Global Liquidity. *The Review of Economic Studies*, 82(2), 535-564.

Bryant, J. (1980). A Model Of Reserves, Bank Runs And Deposit Insurance. *Journal of Banking and Finance*, 4(4), 335-344.

Buigut, S., and Rao, V. K. (2011). International Financial Integration Of The Indian Money Market. *International Journal of Economics and Finance*, 3(4).

Buiter, W., and Sibert, A. (2007). The Central Bank As Market Maker Of Last Resort: From Lender Of Last Resort To Market Maker Of Last Resort. Available at https://voxeu.org/article/subprime-crisis-what-central-bankers-should-do-and-why

Caballero, R. J., Farhi, E., and Gourinchas, P. (2017). The Safe Assets Shortage Conundrum. *The Journal of Economic Perspectives*, 31(3), 29-45.

Calvo, G. and Reinhart, C.M. (2000). Fear of Floating. *NBER Working Paper No. 7993*. National Bureau of Economic Research.

Calvo, G. A., and Reinhart, C. M. (2002). Fear Of Floating. *The Quarterly Journal of Economics*, 117(2), 379-408.

Cavoli, T. and Rajan, R. (2003). Designing Appropriate Exchange Rate Regimes for East Asia: Inflation Targeting and Monetary Policy Rules. Discussion Paper No. 309. Adelaide: Centre for International Economic Studies.

Cerra, V., and Saxena, S. C. (2002). What Caused The 1991 Currency Crisis In India? *IMF Staff Papers*, 49(3).

Chakaravarty, S. (1985). Report Of The Committee To Review The Working Of The Monetary System (Chair: S. Chakravarty). Mumbai: Reserve Bank of India.

Chakarbarty, S. (1960). Interbank call money rate: No ceiling. Economic and Political Weekly, 12(4-5-6), 273.

Chamon, M., Qureshi, M. S., Ostry, J. D., and Ghosh, A. R. (2011). *Managing Capital Inflows: The Role Of Capital Controls And Prudential Policies*. Cambridge, Mass: National Bureau of Economic Research.

Chailloux, A., Simon G., and McCaughrin, R. (2008). Central Bank Collateral Frameworks: Principles and Policies. IMF Working Paper 08/222.

Chandrasekhar, C. P. (2010). Global Imbalances And The Dollar's Future. *Economic and Political Weekly*, 45(23), 47-57.

Chick, V. (1986). The Evolution of the Banking System and the Theory of Saving, Investment and Interest." Economies et societes, 3 (8-9), 111-126.

Chick, V. (1993). The Evolution of the Banking System and the Theory of Monetary Policy. In S. Frowen (ed.), *Monetary Theory and Monetary Policy: New Tracks in the 1990s*. Basingstoke, UK: St. Martin's Press, 79-92.

Chick, V., and Dow, S. (2002). Monetary Policy With Endogenous Money And Liquidity Preference: A Non-dualistic Treatment. *Journal of Post Keynesian Economics*, 24(4), 587-607.

Christophers, B. (2015) The Limits to Financialization. *Dialogues in Human Geography*, 5(2), 183-200.

Claessens, S., Pozsar, Z., Ratnovski, L. and Singh, M. (2012). Shadow Banking: Economics and Policy. IMF Staff Discussion Note, 12/12.

Christensen, J. (2004). Capital Inflows, Sterilization, and Commercial Bank Speculation: The Case of the Czech Republic in the Mid-1990s. *IMF Working Paper No. 04/218*.

Chui, M., Fender, I., and Sushko, V. (2014). Risks Related To EME Corporate Balance Sheets: The Role Of Leverage And Currency Mismatch. *BIS Quarterly Review*, September 2014. Bank for International Settlements.

Chwieroth, J. M. (2014). Controlling Capital: The International Monetary Fund And Transformative Incremental Change From Within International Organisations. *New Political Economy*, 19(3), 445-469.

Colander, D. (1992). Retrospectives: The Lost Art Of Economics. *The Journal of Economic Perspectives*, 6(3), 191-198.

Colander, D. (1998) Confessions of an Economic Gadfly. In Michael Szenberg (ed), *Passion and Craft: Economists at Work*. Ann Arbor: University of Michigan Press, 39-55.

Committee on Global Financial Systems. (2014). Market-Making And Proprietary Trading: Industry Trends, Drivers And Policy Implications. Bank of International Settlements.

Coeure, B. (2018). Monetary Policy and Climate Change. Speech delivered at conference on 'Scaling up Green Finance: The Role of Central Banks", Berlin, 8 November. Available at https://www.ecb.europa.eu/press/key/date/2018/html/ecb.sp181108.en.html

Cordero, J.A. (2008). Economic Growth under Alternative Monetary Regimes: Inflation Targeting vs Real Exchange Rate targeting. *International Review of Applied Economics* 22(2), 145– 60.

Crotty, J. (2009). Structural Causes Of The Global Financial Crisis: A Critical Assessment Of The 'New Financial Architecture'. *Cambridge Journal of Economics*, 33(4), 563-580.

Damachis, B. (1994). The Bombay Securities Scam Of 1992: The Systemic And Structural Origins. *Policy, Organisation and Society*, 7(1), 40-45.

Davies, G. (2013). India Needs To End Fiscal Dominance Over The Central Bank. Financial Times, 1st September. Available at https://www.ft.com/content/3489b53c-d10b-3713-bede-a3b3185c33dd.

Debelle, G., Masson, P., Savastano, M. and Sharma, S. (1998). Inflation Targeting as a Framework for Monetary Policy. IMF Economic Issues No. 15.

Dey, I. (2007). Grounding Categories. In *The SAGE Handbook of Grounded Theory*, Edited by: Bryant, A. and Charmaz, K. (Eds)167–190. Los Angeles: Sage.

Devriese, J., and Mitchell, J. (2006). Liquidity Risk In Securities Settlement. *Journal of Banking and Finance*, 30(6), 1807-1834.

Diamond, D. W., and Dybvig, P. H. (1983). Bank Runs, Deposit Insurance, And Liquidity. *Journal of Political Economy*, 91(3), 401-419.

Diaz-Alejandro, C. (1985). Good-Bye Financial Repression, Hello Financial Crash. *Journal of Development Economics*, 19(1), 1-24.

Dikau, S. and Volz, U. (2021). Central Bank Mandates, Sustainability Objectives and the Promotion of Green Finance. *Ecological Economics*. 184(2021), 107022.

Domanski, D. (2016). Foreign exchange market intervention in EMEs: what has changed? *BIS Quarterly Review*, 65-79. Bank for International Settlements.

Domanski, D., Scatigna, M. and Zabai, A. (2016). Wealth Inequality And Monetary Policy. *BIS Quarterly Review*, March. Bank of International Settlements.

Dooley, K. (2014). Can emerging economy central banks be marketmakers of last resort? Remarks Delivered at BIS Workshop "Rethinking the Lender of Last Resort", Basel, 15 May 2014, https://www.bis.org/publ/bppdf/bispap79k.pdf

Dooley, M. P., and Frankel, J. A. (2001). *Managing Currency Crises In Emerging Markets*. Chicago: University Of Chicago Press.

Dow, S. C., Ghosh, D., and Ruziev, K. (2008). A Stages Approach to Banking Development in Transition Economies. *Journal of Post Keynesian Economics*, *31*(1), 3–33.

Dutt, A. K. (1997). Uncertain Success: The Political Economy Of Indian Economic Reform. *Journal of International Affairs (New York)*, 51(1), 57-83.

Dutta, S. J. (2019). Sovereign Debt Management And The Transformation From Keynesian To Neoliberal Monetary Governance In Britain. *New Political Economy*, 25(4), 675-690.

Dutta, S.J., Kremers, R., Pape, F. and Petry, J. (2020). Critical Macro-Finance: An Introduction. *Finance and Society,* 6(1), 34–44.

Dwyer, G. P., and Tkac, P. (2009). The Financial Crisis Of 2008 In Fixed-Income Markets. *Journal of International Money and Finance*, 28(8), 1293-1316.

Dyson, K. H. F. (2014). *States, Debt, And Power: 'Saints' And 'Sinners' In European History And Integration*. Oxford: Oxford University Press.

ECB. (2007). The Collateral Frameworks Of The Federal Reserve System, The Bank Of Japan And The Eurosystem. Monthly Bulletin (European Central Bank), (10), 85-100.

Economic Times (2022). How the IL&FS Crisis Ravaged India's NBFC Sector A Timeline. March 31. Available at https://bfsi.economictimes.indiatimes.com/news/nbfc/how-the-ilfs-crisis-ravaged-indias-nbfc-sector-a-timeline/90541212

Elmendorf, D.W., and Mankiw, G. (1999). Government Debt. In John B. Taylor and Michael Woodford (eds.), *Handbook of Macroeconomics*, Vol. 1, Amsterdam: Elsevier Science.

Epstein, G. (2005). Introduction: Financialization and the World Economy. In *Financialization and the World Economy*, ed. G. Epstein, 3-16. Cheltenham and Northampton: Edward Elgar.

Epstein, G. A. (2006). *Central Banks as Agents of Economic Development*. Helsinki: UNU World Institute for Development Economics Research.

Epstein, G.A. and Yeldan, E. (2010). *Beyond Inflation Targeting: Assessing the Impacts and Policy Alternatives*. Cheltenham: Edward Elgar Publishing.

Epstein, G. (2013). Developmental Central Banking: Winning The Future By Updating A Page From The Past. *Review of Keynesian Economics*, 1(3), 273-287.

Foucault, T., Pagano, M. and Röell, A. (2013). *Market Liquidity: Theory, Evidence, and Policy*. New York: Oxford Academic.

Filardo, A. J., and Grenvile, S. (2012). Central Bank Balance Sheets And Foreign Exchange Rate Regimes: Understanding The Nexus In Asia. *BIS Papers* No. 66. Bank for International Settlements.

Finch, J. H. (2002). The Role Of Grounded Theory In Developing Economic Theory. *The Journal of Economic Methodology*, 9(2), 213-234.

Fischer, S. and Easterly, W. The Economics of the Government Budget Constraint. (1990) *World Bank Research Observer* July.

FitzGerald, V. (2004). Monetary Models and Inflation Targeting in Emerging Market Economies. Discussion Paper No. 189. Oxford: University of Oxford, Department of Economics.

Flick, U. (2018). *Doing Grounded Theory: Key Components, Process And Elements*. City Road: SAGE Publications Ltd.

Folkerts-Landau, D., and Cassard, M. (1997). Risk Management Of Sovereign Assets And Liabilities. *IMF Working Papers*, WP/1997/176.

Frenkel, R. and Rapetti, M. (2009). A Developing Country View Of The Current Global Crisis: What Should Not Be Forgottebn And What Should Be Done. *Cambridge Journal of Economics*, 33(4) 685-702.

Friedman, M. (1960). *A Program for Monetary Stability*. New York: Fordham University Press.

Fullwiler, S. T. (2003). Timeliness And The Fed's Daily Tactics. *Journal of Economic Issues*, 37(4), 851-880.

Fullwiler, S.T.; Kelton, S. and Wray, L.R. (2012). Modern Money Theory: A Response to the Critics. *Political Economy Research Institute*, Working Paper no. 279.

Gabor, D. (2021). Revolutions Without Revolutionaries: Interrogating The Return Of Monetary Financing. *Transformative Responses To The Crisis*. Available at https://transformative-responses.org/wp-content/uploads/2021/01/TR_Report_Gabor_FINAL.pdf

Gabor, D. (2010). The International Monetary Fund and its New Economics. *Development and Change* 41(5), 805-30.

Gabor, D. (2011). *Central Banking And Financialization: A Romanian Account Of How Eastern Europe Became Subprime*. Basingstoke: Palgrave Macmillan.

Gabor, D. (2012). Managing Capital Accounts In Emerging Markets: Lessons From The Global Financial Crisis. *The Journal of Development Studies*, 48(6), 714-731.

Gabor, D. (2014). Learning From Japan: The European Central Bank And The European Sovereign Debt Crisis. *Review of Political Economy*, 26(2), 190-209.

Gabor, D. (2015). Carry Trade. In *The Encyclopedia Of Central Banking* by L.-P. Rochon and S. Rossi, (Eds), Edward Elgar Publishing: Cheltenham, UK

Gabor, D. (2016). The (Impossible) Repo Trinity: The Political Economy Of Repo Markets. *Review of International Political Economy,* 23(6), 967-1000.

Gabor D., and Ban C. (2016). Banking On Bonds: The New Links Between States And Markets. *Journal of Common Market Studies* 54(3), 617–635.

Gabor, D. (2018). Goodbye (Chinese) Shadow Banking, Hello Market-Based Finance. *Development and Change*, 49(2), 394-419.

Gabor, D., and Vestergaard, J. (2018). Chasing Unicorns: The European Single Safe Asset. *Competition & Change*, 22(2), 139-164.

Gabor, D. (2020). Critical Macro-Finance: A Theoretical Lens. *Finance and Society*, 6(1), 45-55.

Gabor, D. and Vestergaard, J. (2022). Should Central Banks Be A Vehicle For Fiscal Disciplining. *Cambridge Journal of Economics*, 46, 491–509.

Gadanecz, B., Mehrotra, A. N., and Mohanty, M. S. (2014). Foreign Exchange Intervention and the Banking System Balance Sheet in Emerging Market Economies. Bank of International Settlements.

Gallagher, K.P., Griffith-Jones, S. and Ocampo, J.A., (2012) Regulating Global Capital Flows for Long-Run Development. Task Force Report 2012. Boston, MA: Pardee Center.

Gao, Y. (2021). Rethinking The Formalism-Substantivism Debate In Social Science: A Perspective From Recent Developments In Economic Methodology. *Modern China*, 47(1), 3-25.

Garbade, K. D. (2006). The Evolution Of Repo Contracting Conventions In The 1980s. *Economic Policy Review - Federal Reserve Bank of New York*, 12(1), 27.

Ghosh, S. (2012). Time to Bury Ghosts of Harshad Mehta Scam and Revive Bond Market. *Economic Times*. April 28. Available at https://economictimes.indiatimes.com/news/economy/finance/time-to-bury-the-ghosts-of-harshad-mehta-scam-and-revive-the-bond-market/articleshow/12902886.cms?from=mdr

Goodhart, C. A. E. (2011). The Changing Role Of Central Banks. *Financial History Review*, 18(2), 135-154.

Goyal, K. (2011). Subbarao Says India Needs Capital Inflows to Finance Current Account Deficit. Bloomberg News. 10 May.

Glaser, B. (1978). *Theoretical Sensitivity: Advances In The Methodology Of Grounded Theory*. Mill Valley, CA: Sociology Press.

Glaser, B., and Strauss, A. (1967). *The Discovery Of Grounded Theory: Strategies For Qualitative Research*. Chicago: Aldine.

Goodhart, C. A. E. (1985). The Evolution of Central Banks. London School of Economics.

Goodhart, C. A. E. (1987). Why Do Banks Need a Central Bank? *Oxford Economic Papers*. 39: 75-89.

Gopinath, S. (2011). Centrality of Banks in the Financial System. Speech delivered at
12th Fixed Income Money Market and Derivatives Association-Primary Dealers Association of India Annual Conference, Udaipur (8 January).
Gourinchas, P., and Jeanne, O. (2012). Global Safe Assets. *BIS Working Papers* No. 399. Bank for International Settlements.

Grabel, I. (2015). The Rebranding of Capital Controls in an Era of Productive Incoherence. *Review of International Political Economy* 22(1), 7-43.

Hardie, I., and Howarth, D. J. (2013). *Market-Based Banking And The International Financial Crisis*. Oxford: Oxford University Press.

Hardie, I., Howarth, D., Maxfield, S., & Verdun, A. (2013). Banks And The False Dichotomy In The Comparative Political Economy Of Finance. *World Politics*, 65(4), 691–728.

Hauser, A., (2021). The Dash For Cash: Why Central Banks Need New Tools For Dealing With Market Dysfunction. Bank of England Speech, 7 January.

Hawkins, J., and Mihaljek, D. (2001). The Banking Industry In The Emerging Market Economies: Competition, Consolidation And Systemic Stability - An Overview. *BIS Papers* No. 4. Bank for International Settlements.

Hodgson, G. M. (1998). The Approach Of Institutional Economics. *Journal of Economic Literature*, 36(1), 166-192.

Hoerdahl, P., and King, M.,R. (2008). Development In Repo Markets During Financial Turmoil. *BIS Quarterly Review*, December, 37-53. Bank for International Settlements.

Hofmann, B., Shim, I. and Shin, H.S. (2021) Emerging Market Economy Exchange Rates and Local Currency Bond Markets Amid the COVID-19 Pandemic. Available at SSRN: https://ssrn.com/abstract=3761875 or http://dx.doi.org/10.2139/ssrn.3761875

Holt, R. P. F., and Rosser, J. B. (2018). The Economist Watcher: Economic Contributions Of David Colander. *Review of Political Economy*, 30(4), 534-555.

Howell, E. (2016). Short Selling Restrictions In The Eu And The Us: A Comparative Analysis. *Journal of Corporate Law Studies*, 16(2), 333-372.

Hillig, A. *2019*. Everyday Financialization: The Case of UK Households. *Environment and Planning A: Economy and Space*, 51(7), pp. 1460-1478.

IMF (1998) The Asian Crises: Causes and Cures. *Finance and Development*. July, 35(2). The International Monetary Fund.

Ihrig, J., Senyuz, Z. and Weinbach, G. (2020). The Fed's "AmpleReserves" Approach to Implementing Monetary Policy. *Finance and Economics Discussion Series 2020-022*. Washington: Board of Governors of the Federal Reserve System.Fadrian

Issing, O. (2006). Central Bank Independence - Economic And Political Dimensions. *National Institute Economic Review*, 196(196), 66-76.

Jain, S. (2012). Former RBI Official Slams Rupee Policy. *The Wall Street Journal*, 11th July. Available at https://www.wsj.com/articles/SB10001424052702303919504577520402637178364

Janakiraman, R. (1993). *Report Of The Committee To Enquire Into Securities Transactions Of Banks And Financial Institutions (Chair: R. Janakiraman)*. Mumbai: Reserve Bank of India.

Jayadev, A., Mason, J. W., and Schröder, E. (2018). The Political Economy of Financialization in the United States, Europe and India. *Development and Change*, 49-2, 353-374.

Jones, E., & Matthijs, M. (2019). Rethinking Central-Bank Independence. *Journal of Democracy*, 30(2), 127-141.

Joshi, V. R., and Little, I. M. D. (1994). *India: Macroeconomics And Political Economy: 1964 - 1991* . Washington, DC: World Bank.

Kaltenbrunner, A. (2011). *Currency Internationalisation and Exchange Rate Dynamics in Emerging Markets: A Post-Keynesian Analysis of Brazil*. PhD Thesis. Leeds: University of Leeds.

Kaltenbrunner, A. (2015). A Post Keynesian Framework Of Exchange Rate Determination: A Minskyan Approach. *Journal of Post Keynesian Economics*, 38(3), 426-448.

Kaltenbrunner, A. (2018). Financialised Internationalisation And Structural Hierarchies: A Mixed-Method Study Of Exchange Rate Determination In Emerging Economies. *Cambridge Journal of Economics*, 42(5), 1315-1341.

Kaltenbrunner, A., and Painceira, J. P. (2017). The Impossible Trinity: Inflation Targeting, Exchange Rate Management And Open Capital Accounts In Emerging Economies. *Development and Change*, 48(3), 452-480.

Kamil, H. (2008). Is central bank intervention effective under inflation targeting regimes? the case of colombia. IMF Working Papers, 8088(200), 1-42.

Kohler, K. (2020). Gross Capital Flows And The Balance Of Payments: A Balance Sheet Approach. Post-Keynesian Economic Society, PKWP2019.

Kohli, A. (2006). Politics Of Economic Growth In India: 1980-2005. *Economic and Political Weekly*, 6(1), 1251-1259.

Kindleberger, C. and Aliber, R. (2005). *Manias, Panics, and Crashes: A History of Financial Crises*, New York: John Wiley & Sons.

Knafo, S (2020). Macro-Finance And The Financialisation Of Economic Policy. *Finance and Society,* 6(1), 87–94.

Kose, M. A., Prasad, E., Rogoff, K. and Wei, S. (2006). Financial Globalization: A Reappraisal, *IMF Working Paper 06/189*. International Monetary Fund.

Krippner, G.R. (2005) The Financialization of the American Economy. *Socio-Economic Review*, 3, 73-208.

Kulkarni, V. (1997). Badla: The Mumbia Derivative. *Economic and Political Weekly*, 32(42), 2747.

Kumar, K. (1989). Conducting Key Informant Interviews In Developing Countries.. *AID Program Design and Evaluation Methodology* Report No. 13. Agency for International Development.

Kumhof, M., Rungcharoenkitkul, P., and Sokol, A. (2020). How does International Capital Flow? *BIS Working Papers* No. 890. Bank for International Settlements.

Lee, F. S. (2016). Critical Realism, Method Of Grounded Theory, And Theory Construction. In F. S. Lee, and B. Cronin (Eds.), *Handbook Of Research Methods And Applications In Heterodox Economics* (pp. 35-69). Chleltenham: Edward Elgar.

Leyshon, A. and Thrift, N. J. (2007). *The capitalization of almost everything - The future of finance and capitalism. Theory, Culture & Society*, 24 (7-8), 97-115.

Levine, R. (2002). Bank-based or Market-based Financial Systems: Which is Better? *Journal of Financial Intermediation*, 11(4), 398-428.

Levy-Yeyati, E. and Sturzenegger, F. (2007). Fear of Appreciation. *World Bank Policy Research Working Paper No. 4387*, World Bank.

Lucas, R. (1990). Why doesn't Capital Flow from Rich to Poor Countries? *American Economic Review*, 80, 92–96.

Marshall, D., and Steigerwald, R. (2013). The Role Of Time-Critical Liquidity In Financial Markets. *Economic Perspectives*, 37(2), 30.

Mathis, J., McAndrews, J., and Rochet, J. (2009). Rating the Raters: Are Reputation Concerns Powerful Enough to Discipline Rating Agencies? *Journal of Monetary Economics*, 56(5), 657-674.

McCauley, R. N. (2010). *Managing Recent Hot Money Inflows in Asia*. Edward Elgar Publishing.

McCauley, R. (2018). The 2008 Crisis: Transpacific or Transatlantic? *BIS Quarterly Review*, December: 39-58. Bank for International Settlements.

McKinnon, R. I. (1973). *Money And Capital In Economic Development*. Washington, DC: Brookings Institution.

McKinnon, R. and Schnabl, G. (2004). The East Asian Dollar Standard, Fear of Floating and Original Sin. *Review of Development Economics* 8(3), 331– 60.

McLeay, M., Radia, A., and Thomas, R. (2014). Money Creation In The Modern Economy. *Quarterly Bulletin 2014 Q1*. London: Bank of England.

Mehrling, P. (2011). *The New Lombard Street: How The Fed Became The Dealer Of Last Resort*. Princeton, N.J; Woodstock: Princeton University Press.

Mehrling, P. (2012). Three Principles For Market-Based Credit Regulation. *The American Economic Review*, 102(3), 107-112.

Mehrotra, A. (2013). On The Use Of Sterilisation Bonds In Emerging Asia. *BOFIT Discussion Papers*, 2013(1), 1.

Mihaljek, D. and Tissot, B. (2003) Fiscal Positions In Emerging Economies: Central Banks' Perspective. BIS Papers, No. 20, Bank of International Settlements.

Minea, A., and Tapsoba, R. (2014). Does inflation targeting improve fiscal discipline? *Journal of International Money and Finance*, 40, 185-203.

Minsky, H. (1992). Taking Schumpeter's Methodology Seriously. In F. M. Scherer and M. Perlman (Eds.), *Entrepreneurship, Technological Innovation And Economic Growth: Studies In The Schumpeterian Tradition* (363-370). Ann Arbor, Michigan: University of Michigan press.

Minsky, H. (1986[2008]). *Stabilizing An Unstable Economy*. New York: McGraw-Hill Publishing.

Minsky, H. P. (1957). Central Banking And Money Market Changes. *The Quarterly Journal of Economics*, 71, 171.

Mishkin, F. (2006). Monetary Policy Strategy: How Did We Get Here?. *NBER Working Papers 12515*, National Bureau of Economic Research

Mishkin, F. (2007). Will Monetary Policy Become More Of A Science? *NBER Working Paper Series*, Working Paper No. 13566.

Mody, R. J. (1986). Enlarging The Scope of The Money Markets. *Economic and Political Weekly*, 31(49), 2128.

Mohan, R. (2007). Capital Account Liberalisation and Conduct of Monetary Policy: The Indian Experience. Paper presented at a seminar on 'Globalisation, Inflation and Financial Markets', Banque de France, Paris, France, June 14.

Mohanty, M.,S. (2002). Improving Liquidity in Government Bond Markets: What Can Be Done? BIS Paper, Issue 11. Bank of International Settlements.

Mohanty, M., S. and Turner, P. (2008). Monetary Policy Transmission In Emerging Market Economies: What Is New?. BIS Papers chapters, in: Bank for International Settlements (ed.), Transmission Mechanisms For Monetary Policy In Emerging Market Economies, 35,1-59.

Mohanty, M., S. (2013). Market Volatility and Foreign Exchange Intervention in EMEs: What has Changed? BIS Papers No. 73. Bank for International Settlements.

Monnet, E. and Vari, M. (2019). Liquidity Ratios as Monetary Policy Tools: Some Historical Lessons for Macroprudential Policy. IMF Working Paper No. 19/176.

Morgan, T. (1995). Theory Versus Empiricism In Academic Economics. *Challenge (White Plains)*, 38(6), 46-51.

Moutot, P., Vitale, G., and European Central Bank. (2009). Monetary Policy Strategy In A Global Environment. Federal Reserve Bank of Dallas, Globalization and Monetary Policy Institute Working Papers, 2009(29).

Mukherji, R. (2013). Ideas, Interests, And The Tipping Point: Economic Change In India. *Review of International Political Economy*, 20(2), 363-389.

Mulye, P. (2020). A Timeline Of The Crisis That Brought India's Shadow Banking Sector To Its Knees. *Quartz*, June 3. Available at https://finance.yahoo.com/news/timeline-crises-brought-india-370-061454612.html?guccounter=1&guce_referrer=aHR0cHM6Ly93d3cuZ29vZ2xlLmNvbS8&guce_referrer_sig=AQAAABlxGbX16aCHlnFjURwsXMsyCbWwj6LwsJuVrXAaqys048OPtZ9zj0rojR1u0Ka3FwdEy2dISTbUsw-YPHbbyxQGFuTBusmdxl9bWjT1199XfnAvetP8qqJ5bkUHqrnQ9G4autH8psn2fFxL0IwPRvNXx0sHwMpSOngu2T8V2Jnd

Mundy, S., and Stacey, K. (2018). IL&FS Bailout Sends Shockwaves Through India's Shadow Banks. *Financial Times*. Oct. 2. Available at https://www.ft.com/content/3a9e7832-c621-11e8-8167-bea19d5dd52e

Musthaq, F. (2021). Unconventional Central Banking And The Politics Of Liquidity. *Review of International Political Economy*, DOI: 10.1080/09692290.2021.1997785.

Nair, V. (2019). RBI Rejects Request For Special Classification Of IL&FS Loans. *Bloomberg Quint*, January 9. Available at https://www.financialexpress.com/industry/ilfs-classification-rbi-rejects-bankers-plea-for-six-month-moratorium/1438021/

Naqvi, N. (2018). Manias, Panics and Crashes in Emerging Markets: An Empirical Investigation of the post-2008 Crisis Period. *New Political Economy*, 24(6), 759-779.

Nath, G.C. and Ghose, P. (2017). The Indian Call Money Market. *Clearing Corporation of India Weekly Newsletter*, January 2017, 7.

Nath, G. C. (2008). Role Of Clearing Corporation In Indian Financial Market Development. *Macroeconomics and Finance in Emerging Market Economies*, 1(2), 307-311.

Neilson, D. (2019). *Minsky*. Cambridge: Polity.

Nesvetailova, A. (2007). *Fragile Finance*. Palgrave Macmillan Studies in Banking and Financial Institutions, London: Palgrave Macmillan.

Nyborg, K. G. (2017). Central Bank Collateral Frameworks. *Journal of Banking and Finance*, 76, 198-214.

Obstfeld, M., and Taylor, A.M. (1998). The Great Depression as a Watershed: International Capital Mobility in the Long Run. In *The Defining Moment: The Great Depression and the American Economy in the Twentieth Century*, by M. D. Bordo, C. D. Goldin, and E. N. White (Eds). Chicago: University of Chicago Press.

Obstfeld, M. (2019). The International Monetary System: Living With Asymmetry. In R. C. Feenstra, and A. M. Taylor (Eds.), (301-342). Chicago: University of Chicago Press.

Odendahl, T., & Shaw, A. M. (2002). Interviewing Elites. In J. Gubrium F., & J. Holstein A. (Eds.), *Handbook Of Interview Research* (299-316). Thousand Oaks, California: SAGE Publications.

Öniş, Z. (1991). The Logic of the Developmental State. *Comparative Politics*, 24(1), 109-126.

Ouliaris, S. (2011). What are Economic Models? How Economists Try to Simulate Reality. *Finance & Development*, 48(2), 46-47.

Painceira, J.P. (2021). *Financialisation in Emerging Economies: Changes in Central Banking.* (1st ed.) Routledge.

Pape, F. (2020) Rethinking Liquidity: A Critical Macro-Finance View. *Finance and Society* 6(1), 67–75.

Parekh, H. T. (1952). Creating A Bill Market. *Economic and Political Weekly*, 4(3-4), 111.

Parliament of India (1993). Report Of Joint Committee To Enquire Into Irregularities In Securities And Banking Transactions (Chair: Ram Niwas Mirdha). New Delhi: Parliament of India.

Patel (2011). *Report Of Working Group On Operating Procedure Of Monetary Policy (Chair: Urjit Patel)* . Mumbai: Reserve Bank of India.

Patel (2014). *Report of The Expert Committee to Revise and Strengthen the Monetary Policy Framework (Chair: Urjit Patel).* Mumbai: Reserve Bank of India.

Patnaik, P., and Chandrasekhar, C. P. (1995). Indian Economy under 'Structural Adjustment'. *Economic and Political Weekly,* 30(47), 3001-3013.

Pidgeon, N., and Henwood, K. (2004). Grounded Theory. In M. Hardy, and A. Bryman (Eds.), *Handbook Of Data Analysis* (625-648). London: SAGE Publications.

Poovey, M. (2015). On 'the Limits to Financialization'. *Dialogues in Human Geography*, 5(2), 220-24.

Powell, J. (2013). Subordinate Financialisation: A Study Of Mexico And Its Non-Financial Corporations. PhD Thesis. SOAS, University of London.

Pozsar, Z. (2008). The rise and fall of shadow banking. Available at Https://www.Economy.com/sbs,

Pozsar, Z. (2014). Shadow Banking: The Money View. Available at SSRN 2476415, https://www.financialresearch.gov/working-papers/files/OFRwp2014-04_Pozsar_ShadowBankingTheMoneyView.pdf.

Pozsar, Z. (2015). A Macro View Of Shadow Banking. Available at Http://papers.Ssrn.com/sol3/papers.Cfm?abstract_id=2558945,

Prasad, E., and Rajan, R. (2005). Controlled Capital Account Liberalization: A Proposal. *IMF Policy Discussion Paper*, No. 05/7.

Prasad, E. and Rajan, R. (2008). A Pragmatic Approach to Capital Account Liberalization. *Journal of Economic Perspectives*, 22(3), 149-72.

Rajan, R.G. and Zingales, L. (2003). The Great Reversals: The Politics Of Financial Development In The Twentieth Century. Journal of Financial Economics, 6 , 5-50.

Rajaram, S., and Ghose, P. (May 2015). Two Decades Of Primary Dealer Operations In India. *CCIL Monthly Newsletter*, May 2015, 7-30.

Rajendran, R., and Natarajan, B. (2009). The Impact Of LPG On Life Insurance Corporation Of India (LIC). *Asia Pacific Journal of Finance and Banking Research*, 3(3), 41.

Reddy, Y.V. (1997) Financial Sector Reforms and RBI's Balance Sheet Management. Speech delivered at Vysya Bank 11th Annual Lecture on Banking, Banglaore, Nov. 14.

Reddy, Y.V. (1998a) Managing Capital Flows. Speech delivered at Asia Pacific Centre, Stanford University, Nov. 23.

Reddy, Y.V. (1998b) Monetary and Credit Policy Continuity, Context, Change and Challenges. Speech delivered at Reserve Bank of India, Chennai, May. 2.

Reddy, Y. V. (2002). Fiscal and Monetary Policy Interface: Recent Developments in India. Speech delivered at Harvard University on August 10, 2000.)

Reddy, Y. V. (2017). *Advice And Dissent: My Life In Public Service* (Kindle Edition) Harper Business.

Reinhart, C. M., and Rogoff, K. S. (2008). Is the 2007 US Sub-Prime Financial Crisis so Different? An International Historical Comparison. *The American Economic Review*, 98(2), 339-344.

RBI (1991). *Reserve Bank of India Annual Report 1991-92*. Mumbai: Reserve Bank of India.

RBI (2001a). *Reserve Bank of India Annual Report 2000-01*. Mumbai: Reserve Bank of India.

RBI (2001b). *Report Of The Technical Group For Phasing Out Banks From The Interbank Call/Notice Money Market*. Mumbai: Reserve Bank of India.

RBI (2003). *Report of the Working Group on Instruments of Sterilization*. Mumbai: Reserve Bank of India.

RBI (2005a). *Report of Internal Technical Group on Forex Markets*. Mumbai: Reserve Bank of India.

RBI (2005b). *Mid-Term Review of Annual Policy Statement for the year 2005-06*. Dec. 5. Mumbai: Reserve Bank of India.

RBI (2009). Framework for Addressing Liquidity Concerns of NBFCs. Feb. 18. Mumbai: Reserve Bank of India: Mumbai.

RBI (2010) *Financial Stability Report March 2010*. Mumbai: Reserve Bank of India.

RBI (2011a). *Working Group on Issues and Concerns in the NBFC Sector: Report and Recommendations*. Mumbai: Reserve Bank of India.

RBI (2011b). *Financial Stability Report March 2011*. Mumbai: Reserve Bank of India.

RBI (2013a). *Reserve Bank of India History Volume 4*. Mumbai: Reserve Bank of India.

RBI (2013b) *Financial Stability Report December 2013*. Mumbai: Reserve Bank of India.

RBI (2016) *Financial Stability Report June 2016*. Mumbai: Reserve Bank of India.

Rethel, L. (2010). Financialisation and the Malaysian Political Economy. *Globalizations*, 7(4), 489-506.

Reuters News (2010). India Policy Highlights. Aug. 6. Available at https://www.reuters.com/article/india-policy-snapshot-idINSGE67506320100806

Rey, H. (2015). *Dilemma not trilemma: the global financial cycle and monetary policy independence.* Cambridge, Mass:

Robson, C. (2002). *Real World Research: A Resource For Social Scientists And Practitioner-Researchers*. Oxford: Blackwell.

Roger, S., Garcia, C. and Restrepo, J. (2009) Hybrid Inflation Targeting Regimes. *IMF Working Paper No. 09 (234)*. International Monetary Fund.

Rotwein, E. (1979). The Methodological Basis Of Institutional Economics: Comment. *Journal of Economic Issues*, 13(4), 1029-1033.

Rule, G. (2015). Understanding The Central Bank Balance Sheet. *CCBS Handbook No. 32*, Bank of England.

Sabarinathan, G. (2010). Sebi's Regulation Of The Indian Securities Market: A Critical Review Of The Major Developments. *Vikalpa: The Journal for Decision Makers*, 35(4), 13-26.

Sayers, R. S. (1957). *Central Banking After Bagehot*. Oxford: Clarendon Press.

Sahoo, S. (2013). Financial Structures and Economic Development in India: An Empirical Evaluation. *RBI Working Paper Series No. 2*.

Schumpeter, J. A., (1954). *History Of Economic Analysis*. New York: Oxford University Press.

Sengupta, M. (2009). Making The State Change Its Mind - The Imf, The World Bank And The Politics Of India's Market Reforms. *New Political Economy*, 14(2), 181-210.

Shah, A. (1999). Institutional Change In India's Capital Markets. *Economic and Political Weekly*, 34(3-4), 183-194.

Shah, A., and Pattnaik, I. (2005). India's Experience With Capital Flows: The Elusive Quest For A Sustainable Current Account Deficit. *NBER Working Papers*, Working Paper 11387.

Sharma, S. D. (2009). A Political Economy Of The Indian State In The Era Of Globalisation: A Review. *South Asia*, 32(3), 354-373.

Shin, H. S. (2012). Global Banking Glut And Loan Risk Premium. *IMF Economic Review*, 60(2), 155-192.

Sinha, A. (2011). Macroprudential Policies – Indian Experience. Speech delivered at Eleventh Annual International Seminar on Policy Challenges for the Financial Sector, Washington DC, 2 June.

Shukla, R. (2015). Corporate Finacing in India: Some Stylized Facts of an Emerging Economy. *International Journal of Management Excellence* 5(2): 599-622.

Shleifer, A., and Vishny, R. (2011). Fire Sales In Finance And Macroeconomics. *The Journal of Economic Perspectives*, 25(1), 29-48.

Singh, M. (2011). Velocity Of Pledged Collateral: Analysis And Implications. *IMF Working Paper*, WP/11/256.

Singh, C. (2015). Separation Of Debt And Monetary Management In India. *IIMB Management Review*, 27(1), 56-71.

Sissoko, C. (2019). Repurchase Agreements And The (De)Construction Of Financial Markets. *Economy and Society*, 48(3), 315-341.

Sisung, R. L. (1994). The Law Of Salomon: A History Of The Regulation Of Government Securities, An Accounting Of The Salomon Brothers Scandal And An Analysis Of The Government Securities Act Amendments Of 1993. *Loyola Law Review*, 40(2), 313.

Sivramkrishna, S., Gune, S., Kandalam, K., & Moharir, A. (2019). Shadow Banking In India: Nature, Trends, Concerns And Policy Interventions. *Review of Economic and Business Studies*, 12(2), 29-46.

Sobrun, J., and Turner, P. (2015). Bond Markets And Monterary Policy Dilemmas For Emerging Markets. *BIS Working Papers* No. 508. Bank for International Settlements.

Sodhani, O.P. (1995). Report of Export Group on Foreign Exchange Markets in India (Chair: O.P. Sodhani). Mumbai: Reserve Bank of India.

Spears, T. (2019). Discounting Collateral: Quants, Derivatives And The Reconstruction Of The 'Risk-Free Rate' After The Financial Crisis. *Economy and Society*, 48(3), 342-370.

Stein, J. C. (2012). Monetary Policy As Financial Stability Regulation. *The Quarterly Journal of Economics*, 127(1), 57-95.

Stigum, M. L., and Crescenzi, A. (2007*). Stigum's Money Market* (4th ed.). London; New York: McGraw-Hill.

Stone, M., Scott, R., Shimizu, S., Nordstrom, A., Kisinbay, T. and Restrepo, J. (2009). The Role of the Exchange Rate in Inflation-Targeting Emerging Economies. *IMF Occasional Paper No. 267*. International Monetary Fund.

Streeck, W. The Fourth Power. *New Left Review*. March/April 2018. Available at https://newleftreview.org/issues/ii110/articles/wolfgang-streeck-the-fourth-power

Subbarao, D. (2013). Central Banking In Emerging Economies: Emerging Challenges
. Speech Delivered at European Economics and Financial Centre on July 17.

Subbarao, D. (2020). What is the problem that monetisation is trying to solve? Indian Express, 28th May. Available at https://indianexpress.com/article/opinion/columns/covid-19-relief-package-india-economy-rbi-fiscal-deficit-nirmala-sitharaman-duvvuri-subbarao-6430542/

Tarullo, D. K. (2019). Financial Regulation: Still Unsettled A Decade After The Crisis. *The Journal of Economic Perspectives*, 33(1), 61-80.

Thiemann, M., Melches, C. R., and Ibrocevic, E. (2020). Measuring And Mitigating Systemic Risks: How The Forging Of New Alliances Between Central Bank And Academic Economists Legitimize The Transnational Macroprudential Agenda. *Review of International Political Economy*, 28(6), 1433-1458.

Thomson, J. B. (1999). Panel: thoughts on the future of payments and central banking: the role of central banks in money and payments systems. *Journal of Money, Credit and Banking*, 31(3), 677.

Tietmeyer, H. (2006). From Theory To Practice. Speech at ECB Colloqium Held in Honour of Otmar Issing, 16-17 March 2006.

Reuters News (2010) Timeline-Changes to India's SLR for Banks since 1949. Available at https://www.reuters.com/article/india-cbank-slr-idINSGE6610JO20100702.

Sayers, R.S. (1957). *Central Banking After Bagehot*. Oxford: Clarendon Press.

Schrimpf, A., Shin, H.,S., and Sushko, V. (2020). Leverage and margin spirals in fixed income markets during the Covid-19 crisis. *BIS Bulletin No. 2*, Bank for International Settlements.

Thornton, H. (1802, 1939, 1962). *An Inquiry into the Nature and Effects of the Paper Credit of Great Britain*, ed. Hayek. F.A.V. New York: Augustus M. Kelley.

Tooze, J. A. (2018). *Crashed: How A Decade Of Financial Crises Changed The World*. New York: Viking.

Toscano, F. (2020). Does the Dodd-Frank act Reduce the Conflict of Interests of Credit Rating Agencies? *Journal of Corporate Finance* 62, 101595.

Tucker, P. (2004). Managing the central bank's balance sheet: Where monetary policy meets financial stability. Bank of England, Delivered on 28 July 2004 to mark the 15th anniversary of the founding of Lombard Street Research, https://www.bankofengland.co.uk/-/media/boe/files/quarterly-bulletin/2004/managing-the-central-banks-balance-sheet-where-monetary-policy-meets-financial-stability.pdfhttps://www.bankofengland.co.uk/-/media/boe/files/quarterly-bulletin/2004/managing-the-cen.

Urquhart, C., Lehmann, H., and Myers, M. D. (2010). Putting The 'Theory' Back Into Grounded Theory: Guidelines For Grounded Theory Studies In Information Systems. *Information Systems Journal,* 20(4), 357-381.

U.S. Department of Treasury (1992). Joint Report on the Government Securities Market. Washington, DC: Department of the Treasury. Available at https://home.treasury.gov/system/files/276/joint-report-on-the-government-securities-Market-1992.pdf

Vargas, H., González, A., and Rodríguez, D.,. (2013). Foreign Exchange Intervention In Colombia . *BIS Paper no.* 73. Bank for International Settlements.

Wade, R. H. (2018). The Developmental State: Dead or Alive?. *Development and Change*, *49*(2), 518-546.

Williamson, J. (2000). What Should the World Bank Think about the Washington Consensus?. *The World Bank Research Observer* 15(2), 251–64.

Vaghul, N. (1987). Report of the Working Group on the Money Market (Chairman : *N. Vaghul*). Mumbai: Reserve Bank of India.

Vasant, K. (2012). RBI: Committed to Open Up of Capital Account. *The Wall Street Journal.* April 16.

Velayudham, T. K. (1987). Missing The Wood For The Trees. *Economic and Political Weekly*, 22(18), 776.

Vernengo, M. (2008). The Political Economy of Monetary Institutions in Brazil: The Limits of the Inflation-Targeting Strategy, 1999–2005. *Review of Political Economy* 20(1), 95– 110.

Viktorov, I. and Abramov, A. (2022). The Rise Of Collateral-Based Finance Under State Capitalism In Russia. *Post-Communist Economies*, 34(1), 15-51.

Yongding, Y. (2008). Managing Capital Flows: The Case Of The People's Republic Of China. *ADB Institute Discussion Paper*, No. 96.

Zhang, L., and Zoli, E. (2016). Leaning Against The Wind: Macroprudential Policy In Asia. *Journal of Asian Economics*, 42, 33-52.

Appendices

Appendix 1: Timeline Of Capital Account Liberalization After Balance Of Payments Crisis

Date	Policy Change
September 1992	Foreign Institutional Investors (FIIs) allowed to invest up to 24% in paid-up capital of company with no single FII owning more than 5%.
November 1995	FII investment allowed in debt securities with overall investment limit set at $1-1.5 billion. FIIs required to invest minimum 70% of portfolio in equity products.
November 1996	Separate category of 100% debt FIIs created. Overall investment limit retained at $1-1.5 billion
April 1997	Aggregate Limit for FIIs raised to 30% of paid-up capital if approved by company's Board of Directors
April 1998	FII investment limit of $1 billion (as a group) in dated government securities specified (Investment in T-Bills allowed from May 1998)
June 1998	Individual FII investment limit in a particular company increased to 10% from 5%. Separate and identical limit for categories of non-resident Indians
June 1998	FIIs permitted to invest in equity derivatives
March 2001	Aggregate Limit for FIIs raised to 49% of paid-up capital if approved by company's Board of Directors
September 2001	Aggregate Limit for FIIs raised to sectoral cap as specified in Foreign Exchange Management Act (FDI Policy)
December 2003	FIIs required to be approved by SEBI only, instead of SEBI and RBI previously
November 2004	Overall investment limit in government debt raised to $1.75 billion from $1 billion

November 2004	Separate overall limit of $500 million in corporate debt specified
April 2006	Overall FII investment limit in government debt raised to $2 billion from $1.75 billion, in corporate debt to $1.5 billion from $0.5 billion
September 2006	Separate limit of $500 million for FII investment in Upper Tier 2 instruments
January 2007	Overall FII investment limit in government debt raised to $2.6 billion from $2 billion (increase only for 100% debt FIIs)
January 2008	SEBI scraps dual classification of FIIs as regular (70:30) and 100% debt. Overall FII investment limit in government debt raised to $3.2 billion from $2.6 billion
June 2008	Overall FII investment limit in government debt raised to $5 billion from $3.2 billion, in corporate debt to $3 billion from $1.5 billion
October 2008	Overall FII investment limit in corporate debt raised to $6 billion from $3 billion
February 2009	Overall FII investment limit in corporate debt raised to $15 billion from $6 billion

Source: Mohan (2007), RBI press releases.

Appendix 2: Timeline of Measures to Liberalize Portfolio Inflows from 2007 onwards

Date	Policy Change
January 2007	Overall Foreign Institutional Investor (FII) investment limit in government debt raised to $2.6 billion from $2 billion (increase only for 100% debt FIIs)
January 2008	Securities and Exchange Board of India scraps dual classification of FIIs as regular (70:30) and 100% debt. Overall FII investment limit in government debt raised to $3.2 billion from $2.6 billion

June 2008	Overall FII investment limit in government debt raised to $5 billion from $3.2 billion, in corporate debt to $3 billion from $1.5 billion
October 2008	Overall FII investment limit in corporate debt raised to $6 billion from $3 billion
February 2009	Overall FII investment limit in corporate debt raised to $15 billion from $6 billion
November 2010	Limits according to maturity introduced; Government debt limit raised to $10 billion from $5 billion but increase only applicable to debt with minimum 5-years residual maturity (referred to as long-term debt); Corporate debt limit also increased by $5 billion for long-term debt aimed at attracting funding for infrastructure projects
March 2011	Long-term corporate debt limit increased to $25 billion from $5 billion
August 2011	Separate $3 billion category within $25 billion long-term corporate debt limit for FIIs investing in infrastructure mutual funds
November 2011	Government and corporate debt limit with no maturity restrictions increased by $5 billion each to $10 billion and $20 billion, respectively
June 2012	Long-term government debt limit increased to $10 billion from $5 billion and maturity restriction reduced to 3 years from 5 years. Foreign pension, sovereign-wealth, insurance funds and central banks allowed to invest in long-term debt.
September 2012	Qualified Foreign Investors (HNIs etc.) allowed to invest $1 billion in corporate debt without any maturity restriction
January 2013	Long-term government debt limit increased to $15 billion from $10 billion; 3-year residual maturity requirement scrapped but no investment in T- bills permitted. Non-infra corporate debt limit raised to $25 billion from $20 billion, respectively.
April 2013	Government debt categories merged to single category with $25 billion limit and sub-limit of $5.5 billion for T-bills. Corporate debt

	categories merged to single category with $51 billion limit with $3.5 billion sub-limit for commercial paper
June 2013	Government debt limit increased to $30 billion from $25 billion but increase only for so-called long-term investors (insurance, pension, sovereign-wealth funds, central banks)
January 2014	Limit earmarked for long-term investors in government debt increased to $10 billion from $5 billion within $30 billion overall limit.
June 2014	FIIs to be known as Foreign Portfolio Investors (FPIs) and classified into three categories according to size and profile. Registration process simplified
July 2014	Limit for long-term investors in government debt reduced to $5 billion, limit for foreign portfolio investors increased by $5 billion but with three-year residual maturity requirement. Overall $30 billion investment limit stays
September 2014	Rupee-denominated loans from banks based overseas introduced
September 2015	Masala bonds—rupee-denominated bonds that trade overseas--introduced
October 2015	Limits for FPI investment in government debt to be set in rupee terms; to be increased in phases to reach 5% of outstanding stock by March 2018. FPI investment to be capped at 20% of outstanding stock of individual G-sec. Limit increased to INR1299 billion from INR1244 billion for all FPIs and additional limit for long-term investors increased to INR366 billion from INR291 billion. FPI Investment in loans issued by State governments permitted with limit of INR35 billion
January 2016	Government debt limit increased to INR1354 billion for all FPIs and additional limit for long-term investors increased to INR441 billion. FPI limit for state development loans increased to INR70 billion

April 2016	Government debt limit increased to INR1400 billion for all FPIs and additional limit for long-term investors increased to INR500 billion. FPI limit for state development loans increased to INR105 billion
July 2016	Government debt limit increased to INR1440 billion for all FPIs and additional limit for long-term investors increased to INR560 billion. FPI limit for state development loans increased to INR140 billion
October 2016	Government debt limit increased to INR1480 billion for all FPIs and additional limit for long-term investors increased to INR620 billion. FPI limit for state development loans increased to INR175 billion
January 2017	Government debt limit increased to INR1520 billion for all FPIs and additional limit for long-term investors increased to INR680 billion. FPI limit for state development loans increased to INR210 billion
April 2017	Government debt limit increased to INR1565 billion for all FPIs and additional limit for long-term investors increased to INR745 billion. FPI limit for state development loans increased to INR270 billion.

Source: RBI press releases