

A STUDY FOR THE SUSTAINABLE FINANCE LAB
UTRECHT, THE NETHERLANDS

FULL RESERVE BANKING

An analysis of four monetary reform plans

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In the current monetary system almost all money is created by commercial banks. Following the recent financial crisis some claim that banks have maximized the associated private returns through excessive credit expansion while the costs (risk) have been socialized. This begs the question whether banks should have this prerogative. In response, an alternative monetary system, full reserve banking, has been proposed. It separates money and credit thereby creating a public money system distinct from the private, market allocation of savings and loans. The quantity of money in circulation becomes dependent on a central independent institution while its first allocation is determined by government. Banks have to borrow money from creditors before being able to lend it out, unlike in the current system in which they ‘create it out of nothing’. This research describes and discusses four variations of full reserve banking: the 1930s Chicago Plan recently revived by Benes and Kumhof, Positive Money and NEF’s plans for monetary reform, Kay’s Narrow Banking, and Kotlikoff’s Limited Purpose Banking. Based on own analysis and interviews with over 70 experts it is found that full reserve banking does not *solve* the major problems of the current system. However, it may in some respects be a better system than the current system. The discussion provides new insights about financial reform in an attempt to: 1) Realign risk-return relations between public and private spheres 2) Reconsider money as debt 3) Increase the control of the money supply 4) Ensure a socially useful allocation of (new) money and credit.



EXECUTIVE SUMMARY

Introduction

Nearly five years after the fall of Lehman Brothers high private and now also public debt levels hamper economic recovery and banks remain one of the least trusted institutions in society. According to some, our money system is an important source of these problems. While we use mostly commercial bank debt (current accounts) as money, the reliability of this system requires government guarantees, such as deposit insurance. Also, the use of bank debt as money means that any increase in the amount of money automatically requires more interest-bearing debt. Many believe a system change is necessary to prevent periodic crises and realign risks with potential returns. A structural change is believed to be necessary as stricter regulations can be evaded, weakened over time under lobby pressure and general market sentiments, or may simply be ‘rowing upstream’ against system tendencies. This has led to various monetary reform proposals, including different forms of ‘full reserve banking’ where the prerogative of money creation is transferred from commercial banks to an independent public institution. This institution subsequently controls the money supply quantity, while government spends money into circulation as non-repayable, interest-free debt.

This report provides a description and comparison of four specific proposals: IMF economists Benes and Kumhof’s Chicago Plan (2013), Positive Money and the New Economics Foundation’s modernization of money (2012), Kay’s Narrow Banking (2009) and Kotlikoff’s Limited Purpose Banking (2010). This is followed by an analysis of the arguments for and against full reserve banking in general. Alternative proposals are subsequently stated in order to make a comparison in table form of how full reserve banking deals with the current main problems compared to more traditional reforms and regulations. This analysis is based on a literature review, interviews and discussion sessions with over 70 experts from academia, the financial sector, the central bank and supervisor, policymakers and NGOs.

The Current System versus Full Reserve Banking

In the current system money is created by commercial banks in the process of credit creation and money is destroyed by repayments. In double-entry bookkeeping, credit creation adds a loan entry to a bank’s assets together with an equal current account entry on the liabilities side of the balance sheet. These are both in name of one customer (the borrower). The current account is used by the customer for payments. The central bank has an indirect role by influencing the interest rate that affects the decisions of the economic agents in the credit supply-demand interaction.

Under full reserve banking money creation is centralized at an independent public institution and banks cannot alter this government guaranteed money stock. The payments system is separated from credit creation. Current accounts at banks have to be fully backed by reserves of the public institution. Alternatively, current accounts are removed from banks and placed at the central bank. They cannot be utilized as funding for loans and thus current accounts earn no return and are always accessible. Deposit insurance can subsequently be abolished. If one desires a return (interest) on one’s money, it has to be placed on an investment account at a bank who then can lend it out. This is at the creditor’s and bank’s risk. Commercial banks intermediate by *first* borrowing and *then* lending existing money.

How much money the economy needs is determined by a money growth rule and/or discretionary policy by the public institution. *Where* this new money enters or exits the economy depends mainly on government expenditures and taxation. To avoid a credit crunch, the public institution may also lend funds to banks beyond money saved by the general public. In this case banks also allocate new money. Some form of credit regulation is also facilitated, steering loans to the productive sectors of the real economy.

Arguments For and Against a Transition to Full Reserve Banking

Proponents of full reserve banking claim it aligns public and private risk-return relations better than the current system. It creates a safer public money system and a more diverse and resilient private financial sector without the moral hazard distortions of public interference. Agents with the potential to earn a return will bear the corresponding risk, and therefore are expected to influence what money and credit is used for. Levels of public and private debt are supposedly reduced as money becomes independent of

interest-bearing bank credit, reducing the related growth imperative. A more direct control of the money supply by a central institution is expected to reduce the amplitude of the business cycle better than current monetary policy and more accurately target any inflation rate desired. This institution can be just as independent and credible as today's central bank. Central control, together with the need for banks to first borrow the money they can lend out, places a brake on the opportunities of the financial sector to cause asset price bubbles, speculate, and make unproductive investments. New money can be allocated in a more socially useful manner by the government. However, this assumes a credible threat of no public intervention if an intermediation bank fails as well as the reliability and representativeness of the government.

It is a matter of debate as to whether the system would be more stable and allocate money better under public control than market control. It is also unsure if the effects of other financial innovations (near-monies for example) remain better contained than in the current system. Money cannot be defined as one 'thing' and it remains endogenous: dependent on market demand, the velocity of circulation and saving behavior. The new system may reduce economic growth and utility due to credit scarcity, a diminished flexibility and variety in the financial system. Unintended consequences and uncertainties about the effects of full reserve banking form large obstacles to implementation and limit the political feasibility. A full system change can also not be experimented with, requires careful planning and full commitment to be feasible.

Conclusion

The interviews and discussion sessions undertaken revealed very divergent opinions about full reserve banking. Some were fierce proponents, in the hope of stimulating in particular a structural change in the current system and its implicit mentality. Others continue to claim that the money system is an irrelevant part of our economy and that full reserve banking fails to understand the financial system by focusing on this aspect. In general most do agree that, as is the case with the current regulatory reform agenda, there remains a danger of extensive money creation, asset price bubbles and boom-bust cycles. Therefore, there is a general willingness to consider more fundamental alternatives like full reserve banking; however, predominantly as thought experiments to find new approaches and ideas. A majority still believes that it is possible to fix the current system, without a radical change such as full reserve banking.

Full reserve banking namely does not *solve* the major problems of the current financial system. However, it is potentially an improvement upon the current system that maintains a number of problems but makes them less likely or easier to solve. Money as interest-bearing, to be repaid, bank debt is not necessarily a problem. Money is always a debt and interest-bearing bank debt does not necessitate economic growth because interest is a flow that can be paid out of income and is re-circulated by banks who make up part of the economy. However, under circumstances of a highly concentrated and short-term oriented banking sector that does not bear the risks it is taking, money as bank debt becomes a public concern. Instead of the benefits of money creation being passed on to creditors and borrowers as higher and lower interest rates respectively, it concentrates within the financial sector, benefitting employees and shareholders and inducing inequality. Market discipline ceases and banks maximize the benefits of money creation and minimize the costs (risk), creating an instable system.

A number of elements of full reserve banking could therefore be experimented with in a 'light' version that does not require a full structural change. Banks or the central bank could for example offer an interest-free, low-risk full reserve account that keeps your money without lending it on. Policy stimulating more mutual fund type investment funds and socially embedded banks would improve the awareness and transparency about what savings are used for. A lower deposit guarantee limit could further stimulate individuals to put their money in full reserve accounts or investment funds. Together with higher capital requirements, it could also remove some moral hazard, while credit controls could force banks to invest more in particular sectors, such as SMEs or renewable energy. The instability and lack of resilience due to the concentration of money creation with banks could encourage complementary currencies and other financial institutions such as credit unions. Any 'seigniorage' type gains currently appropriated by banks could be diminished by increasing the competition in the sector (breaking up banks or easing bank license regulation) so that these go to creditors and borrowers. By considering full reserve banking, more corrective mechanisms can be developed to better deal with the current economic crisis.

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I. INTRODUCTION

Nearly five years after the fall of Lehman Brothers, we continue to find ourselves in financial crisis. In particular in Europe high private and now also public debt levels hamper economic recovery and banks remain one of the least trusted institutions in society. Traditional, but also less orthodox reform proposals are receiving more interest as society searches for an explanation and solution to the current problems. According to some, our money system is an important source of these problems. While we use mostly commercial bank debt (current accounts) as money, the reliability of this system requires government guarantees, such as deposit insurance. Also, the use of bank debt as money means that any increase in the amount of money automatically requires more interest-bearing debt. This has yielded various *monetary* reform proposals. One stems from the 1930s Great Depression: the Chicago Plan; proposed by a range of economists including Knight (1933), Angell (1935), and Fisher (1936). To counter the instability of the banking sector that culminated in numerous bank runs and closures, these economists advocated that banks hold 100% central bank reserves against all checkable deposits so to only lend out savings not directly accessible to the creditor. The Plan was not implemented; rather, a separation of commercial and investment banking, federal deposit insurance, reserve requirements and a speculation ban were imposed.

In recent years, the Plan has resurfaced in various forms: by Benes and Kumhof (2013) of the IMF, by Positive Money and the New Economics Foundation – NEF (Jackson and Dyson, 2012), by Kay (2009) as Narrow Banking and by Kotlikoff (2010) as Limited Purpose Banking. These plans transfer the prerogative of money creation from commercial banks to an independent public institution. It controls the money supply quantity (not velocity), while government spends money into circulation as non-repayable, interest-free debt. Fully backed current accounts make up the payments system, which is seen as societal infrastructure that should not be dependent on the health of a commercial bank, government guarantees, or the state of the economy. Current accounts should always be accessible, like having cash always ensures access to money.

I.1. THE CURRENT MONEY SYSTEM

There currently is a direct link between money and credit creation. In double-entry bookkeeping, credit creation adds a loan entry to a bank's assets together with an equal current account entry on the liabilities side of the balance sheet. These are both in name of one customer (the borrower). The current account is used by the customer for payments. Credit creation corresponds with money creation, while repayment reduces the stock of money (expansion and contraction of bank balance sheets). Banks can first make a loan and later attract the required reserves or funding. The system as a whole creates its own funding. Banks have the prerogative of money creation in an endogenous process balancing supply and demand for credit. The central bank has an indirect role by influencing the interest rate that affects the decisions of the economic agents in the credit supply-demand interaction. They do not target the quantity of money, rather the inflation rate. See Dixhoorn (2013) for a more detailed overview of the money system.

This system is prone to financial instability, for two main reasons. First, banks are at risk of bank runs. To prevent this, deposit insurance schemes have been established. This aids the stability of the payments system, the safety of savings and credit. However, guarantees alter risk relations, introduce moral hazard into the system and are not always effective. Second, the money supply is dependent on credit risk and profitability analyses by banks, on the demand for credit, and only indirectly on central bank policy. All money is debt; however, in the current money system interest-bearing and to be repaid bank debt is utilized as money. Incentives are towards expanding the credit and money supply, especially under rising asset prices (collateral for the banks), as this is upon which banks earn their interest margins. In economic downturns the amount of credit *and money* shrinks in a risk-averse reaction of banks to lend less. Central bank control over both money and credit is limited, and the government cannot increase the money supply to stimulate economic growth during downturns without increasing the level of debt. The money supply is pro-cyclical, enhancing business cycle fluctuations.

The proposals to change to a system of full reserve banking claim to alter this. The following subchapter is a brief exposure of what full reserve banking is and the benefits it claims to have. A structural change is believed to be necessary as stricter regulations can be evaded, weakened over time under lobby pressure and general market sentiments, or may simply be 'rowing upstream' against system tendencies.

I.II. FULL RESERVE BANKING

Under full reserve banking money creation is centralized at an independent public institution and banks cannot alter this government guaranteed money stock. The payments system is separated from credit creation. Current accounts at banks become fully backed by some form of public money. A bank's reserve ratio: $\frac{\text{public money}}{\text{current accounts}}$ must be 100%. Alternatively, current accounts are removed from banks and placed at the public institution or in a separate special bank. The accounts cannot be utilized as funding for loans and thus earn no return, are low-risk and always accessible. Deposit insurance can subsequently be abolished. In some proposals time deposits also require 100% backing by particular safe assets. If one desires a return (interest) on one's money, it has to be placed on an investment account at a bank who then can lend it out. This is at the creditor's and bank's risk. Commercial banks intermediate between creditors and borrowers by *first* borrowing and *then* lending *existing* money.

How much money the economy needs is determined by a money growth rule and/or discretionary policy by the public institution. *Where* this new money enters or exits the economy depends mainly on government expenditures and taxation. To avoid a credit crunch, the public institution may also lend funds to banks beyond money saved by the general public. In this case banks also allocate new money. Some form of credit regulation is also facilitated (but not required), steering loans to the productive sectors of the real economy. Commercial banks can still undertake maturity and risk transformations, and match different saving and loan sizes. However, creditors more directly bear part of the investment risk.

One may comment that instead of increasing the reserve requirement to 100%, a lower but significant increase can suffice. There are a number of reasons why this is not the case. First, this would not separate the money and credit creation functions of a bank. This is the key aspect of the 100% reserve plans and would not be achieved at anything other than 100% reserves. Second, less than 100% reserves would pose great difficulty to monetary policy, which would have to simultaneously consider the interest rate and the quantity of money in circulation, as the latter also becomes more controllable. Third, it is easier for lobbies to pressure regulators to reduce the reserve percentage if it is lower than 100%, while a 100% reserve requirement is a number set for a reason. This gradual reduction of the reserve requirement has been seen historically. Under full reserve banking, these problems are reduced. Fourth, 100% reserves ensure that money is not brought into circulation as private, to be repaid, interest-bearing bank debt but as public debt that we owe each other. This is a key element of especially the Positive Money plan.

I.III. OUTLINE OF THIS REPORT

This introduction is followed by individual overviews of the four different plans. First, the modern interpretation of the Chicago Plan by Benes and Kumhof (2013) is presented. This is followed by the proposition of Positive Money and NEF as given in Jackson and Dyson (2012). Then the proposal by Kay (2009) to introduce Narrow Banking is described. It will be explained that Narrow Banking does not *have to be* full reserve banking. Finally, Limited Purpose Banking by Kotlikoff (2010) is presented. The plans are presented along with their claimed benefits and unique potential concerns. Drawbacks that apply to all the plans are considered later. The individual chapters are followed by a concise comparative analysis in table form that provides an overview of the differences between the four proposals. This comparison is followed by a more general evaluation of full reserve banking that is based on the literature review that precedes it as well as interviews and discussion sessions undertaken in April, May, and June 2013 with over 70 experts from academia, the financial sector, the central bank and supervisor, policymakers, and NGOs, predominantly in the Netherlands. A general problem analysis is presented first followed by the arguments for and against full reserve banking.

The report ends with a tabular comparison of the current system with full reserve banking in terms of how they could solve a number of the main problems identified. These go beyond financial stability, as the various conversations revealed that the implications of altering the system may go much further. While full reserve banking does not seem to *solve* these main problems, it can make particular problems less likely or make them easier to solve. This is a characteristic of being a structural reform, while particular instruments or regulations can be utilized to truly solve specific problems. Full reserve banking provides valuable lessons and new ideas for developing such tools that can be implemented without a full systemic change. It provides a concrete basis for a much needed discussion about the role of money and credit in society, as such awareness is critical in the development of a more sustainable financial system.

II. THE CHICAGO PLAN

The Chicago Plan's origins lie in the post-depression period of the 1930s. In a period of bank runs and financial instability, eight prominent economists of the University of Chicago presented a memorandum (Knight, 1933) in which they advocated 100% reserve banking. Various proposals were later put forth including by Currie (1934), Angell (1935), Fisher (1936), Simons (1948) and Friedman (1948). The proposals vary, but all found it would be beneficial to separate the quantity of money in circulation from the lending function of banks, hereby making the money supply independent of the solvency of banks. This stemmed from an observation that during the business cycle, increases and decreases in credit creation also resulted in an increase and decrease of the money supply, thereby magnifying the economic effects of booms and busts. In a downturn for example, limited credit creation reduces the money supply, which can have deflationary effects. This increases the relative value of debts that still have to be repaid and hampers the ability of the economy to reduce the debt burden. More stable, "indestructible" (Fisher, 1936) current accounts would increase the stability of the volume of money, its velocity and value.

The proposals also all had in common that the separation of money and credit could be done most easily by ensuring that all current accounts would be backed, immediately or over time, by some form of government currency. They agreed that this currency did not require any reserves or legal backing as its value was obtained by the State itself and thus the productive capacity of the economy. This would enable better control of the money supply and ensure the safety of current accounts at all times within a type of 'money warehouses', without government intervention. Bank lending would still be possible by money lending institutions and with far less central bank interference. Banks would act only purely as intermediaries: first obtaining funds and subsequently lending these out. The Chicago Plan was not implemented in the 1930s for political reasons and administrative blunders, a lack of understanding by the general public who thought the proposals aimed to end private banking, and the passing away of a key advocate (Phillips, 1992). As stated above, the Glass-Steagall Act separating commercial and investment banking, federal deposit insurance, reserve requirements and a ban on speculation were imposed instead.

While the various Chicago Plan proposals were very similar in their approach to money, they differed in the organization of the credit system and bank lending. Fisher (1936) proposed 'Investment Trust' banks, that lend out funds previously obtained through for example the sale of securities, time (savings) deposits, or own capital. Simons (1948) worried that such securities could become money substitutes and therefore proposed a purely equity-based system where private debt is completely eliminated. Regulation was another manner to ensure this did not occur. Angell (1935) had concerns about the feasibility of the new system, and preferred an alternative option of fully government funded credit. He claimed this would enable a more workable transition since any necessary money could be borrowed from government, maintain public control over the money supply and maximize fiscal benefits.

Other differences arose concerning the reasoning behind the proposal, what the ultimate effects of the reforms would be, how the transition should take place and how credit, money and banking should be regulated post-reform. For example, while Graham (1936) emphasizes that the right to issue a nation's currency should be in the hands of government due to the fiscal benefits that come with it, Friedman (1948) finds his support of the plan in the reduced government intervention that it enables, Fisher (1936) emphasized price stability and the original Chicago Plan memorandum (Knight, 1933) aimed to find a neutral form of money. In terms of the effects of full reserve banking, Fisher (1936) claimed his 100% reserve plan would eliminate boom and bust cycles, while Angell (1935) argued these were driven by numerous other economic factors and the quality of monetary policy, such that only their amplitude and frequency could be reduced. The transition could either be achieved by transferring some of the assets from the commercial banks to the central bank, or to introduce a new liability to the central bank that replaces the current accounts originally in existence. However, this poses great difficulties in choosing which assets to transfer, greatly affecting bank earnings. Alternatively, the banks could be provided with cash (reserves) to back their current accounts, with no inflationary effects. Finally, different post-reform regulations were proposed including whether and how to regulate bank lending, whether to impose discretionary monetary policy or a money growth rule aimed at a set inflation rate, and whether to impose reserve requirements for saving deposits. In the following analysis the modern version of the Chicago Plan will be presented, as proposed by Benes and Kumhof (2013) of the IMF. This choice has been made given the current circumstances vary from those in the 1930s, and thus this plan will be more actual.

II.I. DEFINITIONS

Before elaborating on this form of the Chicago Plan a number of notes must be made. In the proposal, the government and central bank are referred to as the same entity for simplicity – their accounts are consolidated. Furthermore, money is not just defined as checking accounts, but also other safe liabilities that the financial system creates must be 100% backed. Finally, the analysis assumes homogenous households in terms of their debt demands. This assumption of representative agents yields that there is no borrowing or lending between households; however, relaxation of this assumption is accounted for in the analysis.

There are different consequences for money and credit. All monetary liabilities must be fully backed by public money (reserves). Credit assets on the other hand must be funded by non-monetary liabilities. These can either be loans from the treasury, bank equity (like Limited Purpose Banking), or debts of the private sector that remain non-monetary – i.e. these debts cannot start to circulate as money.

II.II. TRANSITION

The Chicago Plan is most easily understood by analyzing the transition. Benes and Kumhof (2013) first present a simplified aggregate balance sheet of commercial banks in the United States. They include the shadow banking sector because of its size and importance. The numbers are based on real data and figures are given in percent of GDP.

Commercial Banks Aggregate Balance Sheet			
<i>Assets</i>		<i>Liabilities</i>	
20	Government bonds	184	Deposits
100	Short-term & mortgage loans		
80	Investment loans		
		16	Equity

Figure 1. Initial aggregate balance sheet of commercial banks (holdings in % of GDP).

The goal of full reserve banking: to back all deposits 100% with reserves, is achieved by extending the balance sheets of the commercial banks with an equal amount of reserves and ‘Treasury Credit’. The reserves yield the 100% backing and the Treasury Credit balances this addition with a loan from the government.

Commercial Banks Aggregate Balance Sheet			
<i>Assets</i>		<i>Liabilities</i>	
20	Government bonds	184	Deposits
100	Short-term & mortgage loans		
80	Investment loans		
		16	Equity
184	Reserves	184	Treasury Credit

Figure 2. Ensuring 100% reserves through a government loan (holdings in % of GDP).

This yields 100% reserve backing of deposits. At this point the two parts of the bank are split up to yield on the one hand ‘Money Banks’ who are merely responsible for the fully backed money supply: a risk-free payments system, and on the other hand ‘Credit Investment Trusts’ who take up the role of

intermediating between creditors and borrowers. In this case the Money Banks and Credit Investment Trusts are separate companies and so the former may desire to charge a small fee per deposit to cover overheads. Other proposals simply place a Chinese wall in between these two functions so that commercial banks can continue to manage both, competitively attracting deposits in the hope those depositors will also require other bank services. Alternatively, the government could subsidize Money Banks or completely hold all deposits at the central bank.

In this example, Money Banks become a unique entity. The assets of former commercial banks are now held by the Credit Investment Trusts, but instead of their liabilities being to depositors, they owe the government. This is denoted by Benes and Kumhof as a seigniorage claim on the banks, which reclaims past benefits of money creation that banks have had.

Credit Investment Trusts Aggregate Balance Sheet		Money Banks Aggregate Balance Sheet		
<i>Assets</i>		<i>Liabilities</i>		
20	Government bonds	184	Treasury Credit	
100	Short-term & mortgage loans			
80	Investment loans			
		16	Equity	
		184	Reserves	
			184	Deposits

Figure 3. Separating Credit Investment Trusts and Money Banks (holdings in % of GDP).

To simplify, the Credit Investment Trusts pay back a part of the Treasury Credit in the form of the government bonds they still hold.

Credit Investment Trusts Aggregate Balance Sheet		Money Banks Aggregate Balance Sheet		
<i>Assets</i>		<i>Liabilities</i>		
100	Short-term & mortgage loans	184	Reserves	
80	Investment loans			
		164	Treasury Credit	
		16	Equity	
			184	Deposits

Figure 4. Government bonds are canceled against Treasury Credit (holdings in % of GDP).

Another part of the Treasury Credit is used to pay back the short-term and mortgage loans of citizens (households and manufacturers), further reducing the bank balance sheet. This amount is a dividend to citizens that *must* be utilized to pay off their debts, thereby reducing the private debt in the economy significantly. Recall that homogenous agents and thus debt levels were assumed. In reality this process would require a transition period in which different debts were paid off by separate individuals.

Credit Investment Trusts Aggregate Balance Sheet		Money Banks Aggregate Balance Sheet		
<i>Assets</i>		<i>Liabilities</i>		
80	Investment loans	184	Reserves	
		64	Treasury Credit	
		16	Equity	
			184	Deposits

Figure 5. Citizen's dividend: reduction of private (households and manufacturers) debt (holdings in % of GDP).

The result is a much simpler and shorter balance sheet of the Credit Investment Trusts that now only hold investment loans on their assets side, funded by Treasury Credit and bank equity. The amount of

bank equity that is held will likely be reduced by means of an equity payout, given the same capital adequacy requirements.

Credit Investment Trusts Aggregate Balance Sheet		Money Banks Aggregate Balance Sheet	
<i>Assets</i>	<i>Liabilities</i>	<i>Assets</i>	<i>Liabilities</i>
80 Investment loans	71 Treasury Credit	184 Reserves	184 Deposits
	9 Equity		

Figure 6. Equity payout given reduced balance sheet size (holdings in % of GDP).

In the simplest case, the Trusts are limited to lending to productive firms in the real economy, such that lending is GDP-enhancing. Upon relaxing the assumption of homogenous households (as representative agents), there will be intermediation between citizens with surplus money and those with borrowing needs also. Furthermore, while it seems in this situation that most lending is government financed, this does not need to be the case. The government may utilize part of the Treasury Credit to repay any other outstanding government debt not held by the financial sector. The investment loans hereby become financed by long-term non-monetary private deposits.

Credit Investment Trusts Aggregate Balance Sheet		Money Banks Aggregate Balance Sheet	
<i>Assets</i>	<i>Liabilities</i>	<i>Assets</i>	<i>Liabilities</i>
80 Investment loans	60 Long-term non-monetary private Deposits	184 Reserves	184 Deposits
	11 Treasury Credit		
	9 Equity		

Figure 7. Repay government debt held outside the financial system with Treasury Credit (holdings in % of GDP).

This diminishes the role of government in the provision of credit but also removes government debt as a saving instrument and benchmark asset for the financial markets. Below the changes that occur on the balance of the government are considered.

Prior to the reform, the government has various net assets and government bonds on its liabilities side.

Government Balance Sheet	
<i>Assets</i>	<i>Liabilities</i>
80 Other net assets	80 Government bonds (debt)

Figure 8. Initial government balance sheet (holdings in % of GDP).

Reserves are issued on the liabilities side balanced by the Treasury Credit claim on commercial banks (asset). The reserves are not debt, they are government equity, much like coins are issued today.

Government Balance Sheet			
<i>Assets</i>		<i>Liabilities</i>	
80	Other net assets	80	Government bonds (debt)
184	Treasury Credit (financial asset)	184	Reserves (equity)

Figure 9. Accounting for 100% reserves on the government balance sheet (holdings in % of GDP).

The end result is that government has a large equity position, even after the payment to the citizens that is used to reduce private debt. Note also that fewer government bonds are held as these were canceled against Treasury Credit by the financial sector.

Government Balance Sheet			
<i>Assets</i>		<i>Liabilities</i>	
80	Other net assets	60	Government bonds (debt)
71	Treasury Credit (financial asset)	91	Reserves minus citizens dividend (equity)

Figure 10. Government balance sheet post-transition (holdings in % of GDP).

Kumhof and Benes refer to this process as a large ‘debt-equity swap’.

II.III. BENEFITS

Six main benefits are noted by Benes and Kumhof (2013) to result from an introduction of full reserve banking as stipulated in the Chicago Plan. First, they claim there would be **better control of business cycles driven by bank lending** as money and credit are disconnected. Money creation by commercial banks is no longer possible, making banks true intermediaries and not creators of money. Benes and Kumhof claim that if banks have to acquire funds before lending their ability to commence lending booms is constrained, also because creditors to the bank more explicitly give up real economic transactions and safety, thereby increasing their vigilance over what their money is invested in. Banks cannot create money in a wave of optimism that is not based on economic fundamentals, consequently increasing asset prices, nor is money destroyed by debt repayments. This ensures that changes in the willingness to lend and a bank’s health does not directly affect the money supply and subsequently nominal aggregate demand. Control over the money supply is rather given to government, who can thus dampen the real effects of credit / business cycles more easily through for example counter-cyclical capital requirements. This also increases the system's resilience to shocks.

Second, **bank runs are completely eliminated**. When all deposits are fully backed by reserves, individuals have no reason to suddenly want their money because it is by law always held in the bank. The full amount of their deposits is always instantly accessible. There is thus no need to establish deposit insurance. Furthermore, the effectiveness of both the payments system and bank lending increases as these two core functions are split, allowing separate institutions to focus on each. Money Banks could focus on offering payment services efficiently, not having to consider the quality and risk of their assets. Credit Investment Trusts could focus on borrowing and lending from a long-term perspective, with fewer short-term liability risks and no bank run possibility. This simplification could increase the competitiveness in the sector, with the associated benefits.

Third, there is an expected **reduction of government debt**. This would be a result of the money supply being created as government equity, and all seigniorage gains being allocated to the government instead of the private sector. This can be seen in the Treasury Credit that is introduced in the transition: it is an asset for the government and a liability for the banking sector as a whole.

Fourth, a **reduction of private debt** is claimed to occur. This would be a result of the citizen's dividend, which is paid out from claimed seigniorage gains (Treasury Credit) and must be utilized to pay down household and manufacturer debts. Do note that the total amount of debt is not limited by the money supply however. As Fisher (1936) states: "Of course the volume of loans can exceed the volume of money just as sales do. The same money can negotiate one loan after another just as it can negotiate one sale after another. It can even come back to the same savings bank and be relent". Debt is not abandoned altogether, Credit Investment Trusts are still able to pool funds that they receive from investors, and lend for different periods of time. Key in the Chicago Plan is also the funding of commercial bank loans by Treasury Credit. It can increase the amount of credit available, although generally changes in the interest rate should guide an increase or decrease in funds available for lending. Note these funds are non-monetary; monetary liabilities always remain in the Money Banks backed by reserves. By funding loans with more long-term liabilities, it also becomes easier to extend more long-term loans. Benes and Kumhof claim that it is also not so that the cost of borrowing will go up. While access to cheap deposit funds is eliminated under the Chicago Plan, this is claimed to be compensated by a reduction in the interest rate on government securities because of the debt-equity swap and a reduction in interest rates because of a lower private debt level in the economy. It is claimed that the latter, together with the reduced booms and busts, will increase the amount of funds available for lending by the private sector, further reducing the cost of borrowing.

Fifth, Benes and Kumhof find **significant output gains** of about 10%. These occur for three main reasons. Firstly, due to lower interest rates, which result from lower risk premia in an economy with a lower general debt level. Secondly, output gains result from a reduced tax burden as seigniorage gains from an increasing money stock (necessary for a growing economy) are allocated to government enabling lower (distorting) taxes. Thirdly, monitoring costs are reduced as the creation of money no longer requires debt creation, which otherwise would need monitoring.

Sixth, **liquidity traps are no longer possible post-reform**. Monetary policy tools include a money growth rule to control inflation. Note that this tool is assumed to control very broad money unlike historical quantity policy which could only control narrow money. Alternatively the interest rate on treasury credit lent to banks can also be controlled, and countercyclical capital adequacy rules can be imposed to control bank lending. The liquidity trap is avoided because money is directly controlled by government and not by banks, and because the interest rate on treasury credit can become negative as this rate merely is a borrowing rate, not an opportunity cost. By simplifying the control of the money supply a variety of central bank (discretionary) functions can also be abolished. Meanwhile, zero inflation is made possible. Benes and Kumhof emphasize that the Plan itself is non-inflationary. Given inflation is determined by the relative supply of goods and money in the economy, there is no effect because the supply of goods is not influenced by the Plan and the supply of money is constant. There is merely an alteration in how the money is accounted for. Money before the reform was debt, while post-reform it is backed by reserves and thus non-destructible.

The original Chicago Plan (e.g. Fisher, 1936) adds a number of other benefits. One is the simplicity in banking that is returned to under this Plan. Then, and now again today, the general public has little understanding of the true workings of banks, and in particular of their role in money creation. The Chicago Plan would ease the public's understanding of banking, enabling an increase in trust and influence over the system. Separating the money and credit creation functions of banks also simplifies the tasks of regulators, as they can more directly control one or the other quantity. Fisher (1936) also presents a moral argument that this would reallocate the power and responsibility of money creation to the State. This also has the potential to limit the domination of banks over industry and households, as the State obtains an additional tool to provide credit and money to these parties during economic downturns. This is expected to enable a quicker restoration of confidence and reduction of unemployment.

II.IV. CONCERNS

Benes and Kumhof (2013) identify few drawbacks of the Chicago Plan. This has been its greatest critique, as a balanced presentation of such a plan should evaluate both the potential pros and cons. Only the **transition period** is identified, but they expect the benefits of altering the system to outweigh these time, resource, and uncertainty costs, especially if the transition is spread out such that experience can be gained and any disruptive effects are minimized. The transition period is a general concern for all the full reserve banking plans as is the nature of banking post-reform.

There is an ongoing debate about whether under all forms of full reserve banking, liquidity and maturity transformations can still take place. Critics claim that there are significant liquidity benefits of banks being able to pool/aggregate short-term liabilities including current accounts and make loans of longer maturities. By removing these from loanable funds there is an **efficiency loss as money is left unutilized**.

Critics also point out that there **remains a link between money and credit** post-reform. The amount of money in circulation will likely remain dependent on the saving and lending behavior of households, manufacturers and banks (Hennipman, 1943). Any centralized system will set an upper boundary to this; however, below that banks can choose (not) to lend just like now. The ultimate goal of separating these two bank functions is hereby not fully achieved. This is enhanced by the velocity of money. It enables a single amount of money to be lent, spent, saved and lent out again multiple times. This secondary debt market still enables a debt build-up, price effects or asset bubbles (Manning, 2013).

In addition, under all full reserve plans most **benefits depend on subsequent monetary and fiscal policy** (e.g. control of boom and bust cycles and a stable price level) and not on the system itself. A high level of expertise and independence is required to be able to forecast the amount of money and credit the economy requires and resist responding to political demands. In the same way, the success of any credit guidance will depend on the quality of government and credibility of its threat not to intervene will depend on the concentration of the financial sector (under a highly concentrated sector banks may remain 'too big to fail' and will nonetheless be saved). These general drawbacks will be considered in more detail in a later chapter.

The Chicago Plan specifically fails to pay adequate attention to the **credibility and independence of the institution controlling the money supply**. In the described form it does not differentiate between government and the central bank. This has caused confusion about the accounting and questions whether the system is resistant to political interference.

While this is an important issue, another differentiates the Chicago Plan most from the other three full reserve banking plans: the citizens dividend. This **debt jubilee** may yield income distributional effects and distort risk-return relations as the plan's assumption that debt is homogeneously distributed is unrealistic. Many claim that the result will be that economic agents do not pay for what they have received and the costs and benefits are unevenly distributed.

Another concern is whether the Plan can **ensure that banks do not continue to create money**. Any accepted liability can become money and given the limited changes that occur in the structure of the money system (unlike in the next Positive Money and NEF plan) it may still be possible for banks to create money. Furthermore, this form of full reserve banking aims to control all forms of money and thus must ensure that near-monies do not develop. However, history has shown that such regulations are bound to initiate technological change in avoidance. Under the Chicago Plan these developments may limit the ultimate effect of full reserve banking (Philips, 1992). Benes and Kumhof explain that the threat can be minimized in a number of ways including:

- Ensure the Credit Investment Trusts are not backed by deposit insurance of any kind.
- Remove any tax advantages of debt versus equity to encourage equity funded investment.
- Impose strict guidelines on lending such that short-term lending must be equity funded and long-term debt funded lending is only allowed with particular maturity mismatches and high penalties for early withdrawal.

- Penalties on issuing near-monies to be paid by the issuing institution to the party receiving the near-money to ensure their cooperation.
- Simply make the creation of near-monies illegal.

Whether these methods would be effective remains questionable. It is very difficult to strictly define money as a single controllable entity, especially if one desires to include a large range of different forms of money in that definition. Such a **broad definition** is not attempted in the next plan by Positive Money and NEF, where complementary currencies are free to co-exist with full reserve banking – their plan focuses only on ‘government’ (backed) money.

Finally, the **DSGE model** itself has also received criticism – from a Post-Keynesian perspective that such equilibrium models are unsuitable to model the non-equilibrium nature of the money and credit system, and from a more traditional perspective where the initial conditions and parameter assumptions are criticized. The authors rather see the use of conventional economic tools to evaluate an unconventional proposal such as full reserve banking as added value, and claim that the data used in the model are based on the latest United States data.

II.V. CONCLUSION

In conclusion, the Chicago Plan as presented by Benes and Kumhof (2013) yields a separation of the money and credit functions of commercial banks in order to ensure a stable, indestructible money supply. This is done by lending commercial banks reserves equal to the amount of current accounts they have on their balance sheets. Importantly, the reserves and current accounts are subsequently removed from the balance sheets of commercial banks, which become Credit Investment Trusts, and placed in Money Banks, which merely ensure an efficient functioning of the payments system. The Trusts become pure intermediaries, borrowing and subsequently lending money. This order of actions is particularly important, as it shows that the Trusts do not create money in the lending process.

The main benefits of this reform are found to be a reduction in the amplitude of business cycles, the elimination of bank runs, a reduced public and private debt, as well as output gains and increased control over the money supply enabling zero-inflation targeting. However, a number of elements of the Chicago Plan of Benes and Kumhof have caused concern. These are in particular the combination of the balance sheet of the government and central bank, and the citizen’s dividend (jubilee) that reduces debt levels somewhat undemocratically. Meanwhile, the Plan’s definition of money is very broad yet clear-cut, which may not be realistic. In general, the costs of the transition and post-reform situation need to be better weighed up against the benefits of increased financial stability. Measuring these costs and benefits is however very difficult, as they depend on an infinite number of variables. More theoretical research is thus more likely to yield a useful evaluation – understanding the technical mechanics of the Chicago Plan may reveal more than DSGE simulations.

III. POSITIVE MONEY AND THE NEW ECONOMICS FOUNDATION (NEF) REFORM PROPOSAL

The monetary and banking reform proposal by Positive Money and the New Economics Foundation (NEF) aims to ensure that commercial banks (hereafter banks) no longer have the ability to create money and it separates the payments system from lending (credit creation) and investing activities by banks. Under these reforms, a number of new accounts are created and old balance sheet items are removed. In addition, money obtains a new definition and the balance sheets of the central bank and commercial banks will change. The payments system is simplified, borrowing/lending occurs differently, as does creation and control of money and credit. These elements will be discussed below in more detail, followed by an overview of the transition period and subsequent post-reform benefits that are claimed to result from this monetary reform.

III.I. ACCOUNTS

The traditional accounts that we know today are altered under this reform. In this analysis it is important to distinguish accounts that truly contain money from accounts that are mere records. The following accounts would exist post-reform:

Transaction accounts: these replace what are now known as current or checking accounts. They provide instant access to one's money via checks, ATMs, electronic payment or debit cards. These accounts act as a safety deposit box: 100% of the money always exists. Commercial banks administer each individual's account in an internal database, but the money is held off-balance at a central bank database in *Customer Funds accounts*, organized per commercial bank as follows:

Commercial bank X's internal database of Transaction accounts		Central bank's internal database of Customer Funds accounts	
<i>Customer</i>		<i>Commercial bank</i>	<i>Customer Funds account balance</i>
A	£50	X	£600
B	£100	Y	£1100
C	£50	Z	£800
...
Total Balance of Customer Funds account for bank X:	£600	Sum of all banks' Customer Funds accounts:	£6200

Figure 11. Commercial bank and central bank internal databases (Jackson and Dyson, 2012).

Transaction accounts are thus no longer a liability for a bank; they are the legal property of the individual. The deposits retain their value independently of the solvency and liquidity of individual commercial banks. If a bank fails, its transaction accounts can simply be relocated to a different bank. Transaction accounts are thus risk-free and do not require a deposit insurance scheme. However, they are therefore not interest-bearing. Banks may charge a fee for this service, or offer it free of charge to attract customers.

Investment accounts: these replace what are now known as fixed notice or term savings accounts. Customers that desire a return on their money can transfer it into an investment account. These will vary by an agreed upon intended use or purpose, interest rate, maturity periods and notice period. Related is the level of risk that the investment bears. Investment accounts will also not be protected by any State guarantees or insurance schemes, risks are thus shared between the bank and investor. The money that is allocated to these accounts by customers is directly transferred to the particular bank's *Investment Pool account*, a bank asset that it can use to make investments. The money in Investment Pool accounts is, like Transaction Accounts, held at the central bank. Investment accounts thus do not contain any money, they are the record of the liability that the bank now has towards the customer. To ensure this process does not result in the development of substitute or near-moneys, ownership of the Investment accounts cannot be altered.

Operational accounts: these are the Transaction accounts of commercial banks. They are owned by a bank (a bank asset), but like the Transaction accounts, held off-balance at the central bank. The Operational accounts for example may be used to pay bank wages, or contain retained earnings. Note that the

Operational account is not used in receiving funds for loans and loan repayments, or transferring loans to borrowers and back to Investment Account holders. This is done via the Investment Pool account. The two accounts are held separately at the central bank.

Not only do commercial banks have Operational accounts at the central bank, but the government has a *Central Government account* and the central bank has its own *Central Bank Operating Funds account*. Other central banks (international) and any necessary payment system providers may also have their own accounts.

III.II. BALANCE SHEETS

To clarify, the following balance sheets give the assets, liabilities and off-balance sheet items of a commercial bank and the central bank.

Commercial Bank Balance Sheet		Commercial Bank Customer Funds (held in custody)
<i>Assets</i>	<i>Liabilities</i>	
Loans outstanding	Investment accounts	Transaction accounts (records of the balances of individual customers as given above; funds actually held at Customer Funds Account at the central bank)
Cash	Borrowing from other banks	
Operational account		
Investment Pool account		
Property and fixed assets	Shareholder capital (equity)	

Figure 12. Commercial bank balance sheet and off-balance sheet records (Jackson and Dyson, 2012).

Central Bank Balance Sheet		Central Bank Money Holdings (held in custody)
<i>Assets</i>	<i>Liabilities</i>	
Loans to banks	Foreign exchange bonds in issue	Customer Funds accounts
Securities (Gilts, Bonds, Foreign Currency, etc.)	All other liabilities	Operational accounts of banks
Balances at other central banks		Investment Pool accounts of banks
Bank of England's Operating Funds account		Central Government account
All other assets (property, etc.)		Central Bank's Operating Funds account
		Accounts for other central banks
		Accounts for major payment systems providers (if necessary)

Figure 13. Central bank balance sheet and off-balance sheet money holdings (Jackson and Dyson, 2012).

Based on this overview, we can now define the money supply under this reform proposal as follows. Recall that customer Transaction accounts are aggregated into Customer Funds accounts per bank at the central bank, and the sum of these Customer Funds accounts is the total amount of money available for instant spending.

$$\text{The money supply} = \left[\begin{array}{l} \sum(\text{Customer Funds accounts}) \\ \sum(\text{Investment Pool accounts}) \\ \sum(\text{Operational accounts}) \\ \text{Central Government account} \\ \text{Central Bank Operating Funds account} \\ \text{Other accounts (e.g. other central banks or payment systems providers)} \end{array} \right]$$

Each of these items is the legal property of the respective individual or organization. They can be in the form of cash or electronic deposits. Note also that there are no central bank reserves as in the present

system. These are not needed as the payments system functions fully within the central bank. This happens as follows.

III.III. PAYMENTS

Settlement of payments in this system is fully automated and occurs in real time given a high enough capacity of the central bank payments system. Two different types of payments may occur: transactions between account holders within the same bank, or that have two different banks. In the first situation, the internal database of the commercial bank will register an increase in the Transaction account of one customer, and a decrease in the Transaction account of a second customer. The total balance of the Customer Funds account of this bank does not change. Therefore, there is no alteration of the central bank's internal database.

In the second situation, the Transaction account of one customer increases and the Transaction account of another customer, *at another bank*, decreases. The internal databases of two separate commercial banks are thus altered, as are their total Customer Funds account balances. This alteration is recorded by the central bank in its internal database, where the Customer Funds account balance of each of the respective banks changes. Note that because the money in Transaction accounts is held at the central bank off-balance sheet, no balance sheet alterations take place in this process; only the internal databases record the changes. This is contrary to a situation in which there is lending.

III.IV. BANK LENDING AND CREDIT CREATION

Banks are able to intermediate between borrowers and lenders through their Investment Pool accounts. The process is as follows:

1. Consider a potential lender with a surplus amount of money (e.g. £1000) on her Transaction account and as of yet no money lent to the bank for investment purposes (saving).
2. The money is transferred by the lender from her Transaction account to the bank's Investment Pool, via her Investment account that records the new loan. The changes are recorded as seen below. Note that the detail provided on the lender would be registered in the internal databases; the balance sheets would only show the aggregates here given in bold.

Commercial Bank Balance Sheet		Commercial Bank Customer Funds (held in custody)	
Assets	Liabilities	Transaction accounts	Initial
Investment Pool account	Investment accounts	Initial -£1000	
Initial + £1000	- Lender	- Lender	Initial -£1000
	£0 → £1000	-
...	...		

Figure 14. Change in commercial bank balance sheet and off-balance sheet records.

Central Bank Balance Sheet		Central Bank Money Holdings (held in custody)	
Assets	Liabilities	Customer Funds accounts	Initial
...	...	Initial - £1000	
		- Bank X	Initial - £1000
		-
		Investment Pool accounts of banks	Initial + £1000
		- Bank X	Initial + £1000
		-
	

Figure 15. Change in central bank balance sheet and off-balance sheet money holdings.

3. The bank transfers the money from its Investment Pool account to a borrower's Transaction account, who is now free to use the money. This restores the central bank balance sheet to its initial status. The borrower's loan is recorded as a bank asset on the commercial bank balance sheet, compensated by a reduction of the Investment Pool account. The balance of the

Investment account of the lender remains the same until the loan is paid back not altering the liabilities of the bank. She does not have access to the money lent out until the loan is paid back.

Commercial Bank Balance Sheet		Commercial Bank Customer Funds (held in custody)	
Assets	Liabilities	Transaction accounts	Initial
Investment Pool account Initial + £1000 → Initial	Investment accounts Initial + £1000 - Lender £1000 -	- Lender Initial -£1000 - Borrower Initial +£1000 -	
Loans outstanding Initial → Initial + £1000 - To borrower £1000			
...	...		

Figure 16. Change in commercial bank balance sheet and off-balance sheet records.

Central Bank Balance Sheet		Central Bank Money Holdings (held in custody)	
Assets	Liabilities	Customer Funds accounts	Initial
...	...	- Bank X Initial -	
		Investment Pool accounts of banks Initial - Bank X Initial -	
	

Figure 17. Change in central bank balance sheet and off-balance sheet money holdings.

4. The borrower may make a payment to a third person who does not require the money directly.
5. The third person can then transfer the money from their Transaction account to the bank's Investment Pool account, which can subsequently be lent out again.

Note that at any one point in time, only one person has access to the £1000. First, the lender has instant access to it. Second, the bank has instant access to it. Third, the borrower can use it. Fourth, a third person obtains instant access to it. Finally, the process repeats itself. Due to the circulation of money, this secondary debt market enables a greater access to credit than there is money. Furthermore, given an aggregate number of individuals who want to save their money, banks can still undertake maturity transformations and loan pooling. Risks of defaulting borrowers or delayed repayments, uncertainty concerning the use of minimum notice periods and which portion of lenders will roll over their investment accounts, and investment performance, will all remain, and be born partly by the bank, and partly by the lenders.

Repayment by the borrower to the bank would reduce the transaction account of the borrower, increase the Investment Pool account of the commercial bank, and reduce the Loans Outstanding of the bank. Repayment by the bank to the lender would on the bank's assets side reduce its Investment Pool account and on the liabilities side reduce the Investment Account of the lender. The transaction account of the lender would be increased again too. This process will vary depending on whether the loan is repaid in full or in installments, and when interest is paid. However, never in the entire lending process is money created.

Lending hereby occurs via banks with existing funds and for specific purposes as specified by the bank. While market adjustments of the interest rate are expected to lead to equilibrium borrowing and lending, it is possible that there is an unmet demand for loans. It is proposed to enable an independent body, the Monetary Creation Committee, to create money to lend either directly to the general public or via commercial banks under such circumstances. It may specify that these loans are only used for GDP-enhancing, productive (real economy) spending. This option can provide additional loans in order to avoid a credit crunch. The MCC decides whether there is an unmet demand for loans based on Credit Conditions Surveys. The committee also has the responsibility of determining the money stock that needs to be in circulation.

III.V. MONEY CREATION AND DESTRUCTION

Money is thus no longer created or destroyed by commercial banks in the process of credit creation. This reform proposes to allocate this responsibility to the MCC. It decides the amount of money that is needed in the economy based on the inflation rate, economic activity and population growth. The decision as to how the new money is spent is allocated to government. New money may be spent into the economy via government expenditures, tax reductions, a paying down of the national debt or by means of direct payments to citizens. Money is removed from circulation upon instruction by the MCC either by debiting the Central Government account, selling any Securities owned by the central bank or by not rolling over any loans to commercial banks.

III.VI. TRANSITION

The transition process proposed has two parts. First, an immediate overnight switchover converts all current accounts into State currency (central bank equity). This requires having created the internal databases: the Commercial Bank Customer Funds to keep track of individual transactions and the Central Bank Money Holdings where to store the money and process transactions. The current accounts included are those from the general public, from commercial banks (a.k.a. reserves), from other central banks, as well as any other depositors including government, the central bank's own funds, and major payment systems providers.

Current accounts become Transaction accounts and savings accounts become Investment accounts. Note that while the Investment accounts will, like their predecessors the savings accounts, remain liabilities on commercial bank balance sheets, Transaction accounts are removed from bank balance sheets. This would increase the equity of the banks significantly as their assets remain intact. To ensure banks do not obtain such a windfall profit, a "Conversion Liability" is placed on the bank's balance sheet equal to the amount of the Transaction accounts removed from the balance sheet. The Conversion Liability is owed to the central bank. This first part of the transition process can be most clearly seen in the balance sheet changes that follow.

Central Bank Balance Sheet	
<i>Assets</i>	<i>Liabilities</i>
Loans to banks	Notes in circulation
Securities (Gilts, Bonds, Foreign Currency, etc.)	Public deposits
Repos	Deposits from banks (reserves)
Balances at other central banks	Deposits from other central banks
Derivatives	Other deposits
Quantitative easing	Forex bonds in issue
Securities available for sale	All other liabilities
All other assets (property, etc.)	Equity ↑

All notes become central bank **equity**

All deposits become central bank **equity** and are placed on Central Bank Money Holdings (*held in custody*). Respectively:

- Customer Funds accounts
- Operational accounts of banks
- Accounts for other central banks
- Other deposits may be the Central Government account, the Central Bank's Operating Funds account or accounts for major payment systems providers

Figure 18. Central bank balance sheet changes during the transition.

Commercial Bank Balance Sheet	
<i>Assets</i>	<i>Liabilities</i>
Reserve accounts → Operational accounts Investment Pool account (starts empty) All other assets	Current accounts → Conversion Liability Savings accounts → Investment accounts Other liabilities Shareholder capital (equity)

} Move Current Accounts to Customer Funds account (held in custody) and add Conversion Liability

Figure 19. Commercial bank balance sheet and off-balance sheet records (Jackson and Dyson, 2012).

Note that no assets back the money supply, which becomes central bank equity. The value of money is derived from the productive capacity of the economy. However, in order to ensure this conversion occurs without large transfers of wealth, the Conversion Liability is needed. It is proposed to be interest-free with a maturity similar to the assets of the bank. This means repayment will take time as loans are slowly repaid to the bank and the bank subsequently pays down the Conversion Liability. This occurs in the second part of the transition and is estimated to take 10-30 years. Repayment reduces the debt in the economy, while the money is reinserted into the economy as new money, debt-free, via government spending.

III.VII. BENEFITS

A **reduced level of debt** in the economy is one of the benefits that is claimed to occur under this reform. As debts are repaid and the Conversion Liability is paid down, new money is spent debt-free into the economy and thereby enables a deleveraging of the private sector. Furthermore, while debt will continue to exist because of the complementary demand for credit in the economy, an increase in the money supply no longer requires an increase in debt and a repayment of debts will not destroy money.

Second, the reform proposal emphasizes the benefits of not needing a deposit insurance scheme and being able to **let banks fail** without interruption of the payments system. These are a direct reduction of the potential costs for taxpayers, but also risk alignment, a more level playing field and increased competition amongst banks.

Third, post-reform **control over the money supply** by the MCC is simplified and more direct. A variety of central bank activities, controls, and regulations are no longer needed (e.g. Open Market Operations, the Discount Window Facility, the Deposit Insurance Scheme, Capital Adequacy Requirements can be simplified as banks are allowed to fail). The direct control by the MCC is claimed to enable increased stability in the value of the currency and inflation rate. It also allocates the seigniorage gains associated with the ability to create money to the general public via the government, who in turn also is able to determine the first point of entry of new additional money.

Fourth, it is claimed that by requiring banks to obtain the funds they desire to lend out before they do so will **reduce the possibility of asset price bubbles and improve bank lending**. Boom and bust cycles are expected to dampen because banks no longer create money in the process of creating credit. Hereby the pro-cyclicality of the money supply is removed, as lower lending during economic downturns no longer limits the money supply, which would otherwise worsen the situation. Furthermore, as lenders bear part of the risk of the investments that the banks make, and are made more aware of these direct risks, they are incentivized to monitor the banks more closely. Increased information and transparency would aid this process. It hereby becomes more difficult for banks to obtain money for speculative investments not based on economic fundamentals. The option for the MCC to lend money directly to the public or to commercial banks under certain conditions also increases potential control over credit creation. Furthermore, as the interest rate is no longer a central bank tool to control the money supply, it is more directly linked to the credit market and thus provides better information also. Commercial bank management of cash flows and liquidity is also simplified when Current Accounts are no longer on their balance sheets and funds available for investment all have a specified maturity and notice period.

Fifth, **internationally, no drastic effects** are expected. The proposal can be implemented in a single country, and it even presents the case in which that nation becomes an attractive ‘safe haven’ because of the stability of the currency and safety of Transaction accounts.

Finally, a number of indirect effects are claimed to occur. The separation of the money supply from credit creation and the creation of ‘debt-free’ money is linked to a reduction in inequality through lower interest payments to commercial banks and a reduced chance of banking/financial crises as asset price bubbles are less likely. During crises public spending is frequently cut, affecting mainly the poor. In addition, expenditures on the environment are also reduced. By reducing not only the chance of a financial crisis, but also the severity of the boom and bust cycles, these negative effects are reduced. The environment may also benefit from increased transparency in bank lending, direct credit creation by the MCC and the first spending of new money by government. The system is claimed to hereby become **more democratic**, as complexity is reduced and the public becomes more involved in bank lending.

III.VIII. Concerns

The reform proposal of Positive Money and NEF seems to have only positive effects. However, a number of concerns have arisen. The general concerns described above under the Chicago Plan and that will be further considered below apply to this plan also. In this section issues specifically related to this form of full reserve banking will be considered.

First, there are a number of concerns with the argumentation upon which proponents of this particular plan base their analysis. For example, the plan claims to create ‘debt-free money’. However, all money is debt (Graeber, 2011) as it is a claim, which varies in value, on society. Money and debt can thus not be separated, as they are simply two sides of the same coin. **Debt-free money is a misnomer** from this perspective. While the reform may alter the money we utilize from commercial bank debt, it remains a debt to society as a whole from which the money derives its value. One could also question the claim that we pay interest on our money supply because it is commercial bank debt; the interest is paid on the loan that is received in return and not the money that is created in the process. The transfer of funds to commercial banks is thus not a result of paying for the money supply, but paying for a loan. This would only not be the case if the demand for credit is less than the demand for money purely for transaction/exchange purposes; however, then one returns to whether money and debt/credit can be separated. For the same reason, there would be no growth imperative due purely to the money system (will be considered in more detail in a later chapter). Related is the argument that the reduced money supply associated with credit restrictions worsens slumps in the business cycle remains a question of what comes first. It is likely that during reduced economic activity less money is required because of a lower number of transactions. Whether the reduction in the money supply truly is a *driver* of economic slowdown is difficult to prove.

A second concern is that the **availability of credit will be limited**. Under the Chicago Plan the central institution has a much more explicit role of funding credit than under the Positive Money and NEF form of full reserve banking, who rather keep the public and private sector separated as much as possible. However, they say such scarcity will not be the case for two main reasons: first, the interest rate will balance the demand and supply of funds for lending, and second, if the MCC sees that there is an unmet demand for credit it is able to extend loans directly to the general public or via commercial banks. Such lending by the central institution is similar to that under the Chicago Plan. Although these loans could be extended under particular conditions, this remains reminiscent of the current situation in which the central bank is forced to provide reserves to commercial banks upon demand in order to avoid a credit crunch. True control over the money supply would hereby again be ended as the loans given to the public or to banks would be additional money.

Third, the transition period may **increase the taxpayer’s burden** significantly and actually benefit banks. For example, the proposal includes a clause in which the funds that have been allocated to commercial banks under recent Quantitative Easing is ‘given’ to the banks in their Operational accounts. Jackson and Dyson (2012) state: “This sum is far beyond what the banks would need for actual operating funds (i.e. to cover staff, salaries, rent and other operating costs) and so they would probably wish to use a significant portion of these funds for lending.” The reasoning behind this clause is that there is no shortage of funds

for lending after the switchover; however, one can easily see various non-productive uses that the funds may be appropriated to and this by no means ensures that there is no shortage of loans post-reform. In the same way, commercial banks may benefit greatly from the Conversion Liability if it is not interest-bearing. It namely replaces the current account liabilities that exist today, which are to a certain degree interest-bearing. The interest that no longer has to be paid on these liabilities is profit for the banks.

Fourth, there are **concerns about the independence and feasibility of the MCC**. While this proposal elaborates quite extensively on how this can be ensured, this central institution here would also have the task of ensuring that the information provided by commercial banks about their loans is correct and the notice period agreements between banks and clients are adhered to. Whether the capacity that would be needed for such supervision exists is also unsure. Furthermore, any form of this plan that creates and destroys money via the government budget will result in great uncertainty for the government surrounding its budget – especially if this is done monthly.

Fifth, it is questionable **whether a single reform as such can have such wide spreading consequences** such as reducing inequality and improving the quality of the environment. This extension is quite specific to the Positive Money and NEF plan. It will remain easier, post-reform, to earn money if one already has a starting amount simply because of the nature of the investments that can be done with significant start-up capital as compared to having no money. By investing the money, wealthy individuals can still obtain interest returns from those that need to borrow money. Tendencies towards inequality thereby will remain in the system. The ability of creditors to the banks (those that place their money in Investment accounts) to monitor the bank's activities is also questionable, given their desire for high returns and always asymmetric information. Commercial banks do not necessarily 'choose' or decide how to allocate purchasing power in the economy, this occurs depending on the returns of projects, which will not alter under this reform. Jackson and Dyson (2012) state loan repayment is an important determining factor, but this too is desirable from the perspective of the bank's creditors – as they too want to limit the probability of default. Uncertainty in lending and borrowing remains an issue under full reserve banking.

Finally, there are concerns about **the viability of banking under this reform**. Money is fully removed from bank balance sheets. These will shrink, and likely so too will their business. Given the value of banks, this can be claimed to potentially reduce economic efficiency. Furthermore, while placing money in a Transaction account may reduce the risk of losing the money in its entirety to zero, it does impose losses upon the account holder as inflation reduces the value of the money. The money cannot be invested under this form of full reserve banking, so no return can be obtained in order to counter this inflationary pressure. Unfortunately nothing is said about this hidden cost by Jackson and Dyson (2012). Of course, if the reform results in a zero-inflation economy, this would not be a problem.

III.IX. CONCLUSION

The reform proposal of Positive Money and NEF aims to separate the payments system from lending, in order to protect it from bank failure, enable the abolishment of the deposit insurance scheme and State guarantees, and enable banks to fail without harming daily transactions. The value of one's transaction deposits, a means of payment, is hereby claimed to no longer be dependent on an individual bank's health but rather on the productive value of the economy as a whole. A difference between risk-free (zero return) money in transaction accounts and risk-bearing (but return giving) money in investment accounts is emphasized as an important lesson for the public: risk alignment entails that if you stand to gain a return on an investment you must also be prepared to face potential losses. In this process, different levels of risks need to be available to the general public, complemented by different potential levels of return. Transparency in this interaction between customers and banks is deemed critical.

The reform proposal restricts the role of banks in the economy to money brokers, transferring existing money (purchasing power) between economic agents rather than creating and destroying money to intermediate between borrowers and lenders. Lending thus does not alter the total money stock. Rather, the independent Monetary Creation Committee controls the money supply directly. The benefits are claimed to be extensive and varied, including lower house prices, reduced environmental degradation and lower inequality. This extensive scope and the lack of negative consequences presented in the proposal alarms critics that 'there is no such thing as a free lunch'. There may be a general loss of economic

efficiency as liquidity is reduced, or it may be the financial sector itself that will bear the burden. Alternatively, the plan may have its greatest effect not because it prevents banks from creating money, but because it regulates credit more strictly. It does this by ensuring for example loans are directed towards productive investments in the real economy, by increasing the information and transparency of bank lending, and making explicit that the central bank should prevent house price bubbles. In the latter case the MCC continues to target the traditional CPI, again questioning the impact of separating the money supply from credit creation as opposed to regulating credit. Unfortunately little is said about this. This plan is however very different in its structure and description than the Chicago Plan. The monetary structure is completely altered, there is no debt jubilee and the plan itself is not presented with any quantitative modeling effort. This is understandable, it avoids all drawbacks associated with these elements, in particular the large number of variables that make it difficult to predict what the ultimate effects on output and inflation would be. Most important to Positive Money and NEF is that their plan realigns the responsibility of the costs (risks) and benefits of money and credit creation. It is this principle of public justice that drives this form of full reserve banking.

IV. NARROW BANKING

Narrow banking proposals remove the ability of banks to utilize government insured or guaranteed current account deposits as funding for loans. This is to ensure that taxpayers will not have to protect financial institutions in the future because of the threat to their current account deposits and/or payments system. Kay (2009) explains that the current guarantees distort risk-return relations and the competitiveness of the financial system such that they cause financial instability and inefficiency in the long-run rather than safety. Narrow banking rather recognizes that a division in public policy and bank infrastructure is required between ensuring access to essential services: the payments system and deposit taking, and other services of banks that require a more competitive market. To enable this, banks need to be split into a ‘utility’ money bank – the narrow bank, and an investment bank.

IV.I. NARROW BANKS

The payments system is an essential infrastructure of the economy that is required for national international payments and for institutions and organizations of all sizes. Banks currently also provide another essential service: taking deposits from individuals and firms. Narrow banks would provide these two main services. However, they would be required to hold safe, stable, high-quality, liquid assets (e.g. government securities) equal to the amount of deposits they hold. Note that time and savings deposits are not held in Narrow Banks. Only narrow banks would receive government guarantees in the form of for example deposit insurance and access to the lender of last resort (central bank funding). Depending on the form of these safe, stable, high-quality liquid assets narrow banking becomes full reserve banking. If these are only central bank reserves or government securities the plans near full reserve banking. Alternative forms of Narrow Banking also accept other assets which subsequently does not relocate the prerogative of money creation to a central institution. We focus here on the full reserve form.

Narrow banking proposals thus also vary quite significantly in two main aspects as described in Kobayakawa and Nakamura (2000): first, whether the safe assets that narrow banks must hold must be short-term or can also be long-term, and second whether a narrow bank would still be allowed to lend. In the latter case, the funding for these loans must stem from wholesale markets or bank equity. Furthermore, in case of a narrow bank’s failure, depositors would have to have priority of other creditors and thus will obtain their money from the sale of the safe liquid assets that the bank was required to hold. Kobayakawa and Nakamura (2000) conclude that for maximum efficiency a narrow bank should still also be allowed to undertake lending activity. However, to be effective and avoid liquidity risks, narrow banks should be limited to investing in short-term assets. A small variation in the proposals is whether narrow banks are standalone entities or subsidiaries of banks. Either way, the separation must be strongly monitored to ensure narrow bank assets are not used by Investment Banks, and that the latter also do not have access to the Narrow Bank payments system.

IV.II. INVESTMENT BANKS

Investment banks undertake all non-monetary activities of current commercial banks. They are however not able to take on deposits post-reform from individuals nor from other commercial banks. They are also not guaranteed by government in any way, they are allowed to fail. The maturities of their assets and liabilities are required to match more closely given they can no longer utilize short-term current account deposits as funding for loans. More specifically, the duration of their liabilities must be at least as long as that of their assets. They must utilize funds retrieved from wholesale markets, or own bank capital to be able to invest as such.

IV.III. TRANSITION

The transition would first require banks to choose which form of bank they will become: narrow or investment. Financial regulatory authorities and the central bank will have to be restructured to accommodate their new focus on controlling the quantity of money in circulation, less regulation, and more supervision. The payments system will need to be altered as reserves are no longer required, payments between narrow banks occur by transferring the safe, liquid assets. In a gradual process, narrow banks will have to rid their balance of all saving/time deposits and ensure enough ‘safe’ assets to back their current account deposits. Investment banks will have to rid their balances of any current account

deposits, and acquire, either from retained earnings or wholesale markets, funding for the saving/time deposits they hold.

IV.IV. BENEFITS

Under narrow banking deposit insurance is limited to narrow banks. In the current system this insurance facilitates excessive risk-taking by banks, while post-reform this is not the case as the deposits under the insurance scheme are required to be backed high quality, liquid assets. The government no longer hands over responsibility for the provision of money to commercial banks while simultaneously guaranteeing this money independent of the loan activity of the banks (Phillips, 1995). This realigns risk-return relations and restores the competitiveness of the financial sector thereby increasing its efficiency (de Grauwe, 2009). Phillips (1995) describes how **bank runs become highly unlikely** because deposits are backed by safe highly liquid assets that could for example easily be transformed into central bank cash upon demand. There could also no longer be any disruptions in the payments system and subsequently economic activity upon an (Investment) Bank failing (Kay, 2009).

Phillips (1995) describes how this separation between money and credit creation also **simplifies the task of the central bank** enabling reduced regulation in favor of greater supervision. Indeed the aim of Kay (2009) is to limit regulation to a bare minimum. Central bank policy currently combines money and credit policy, while post-reform this would be separated with a focus on the former. There would be less intervention in the credit system thereby enabling it to function more effectively and efficiently. The central bank would also have more direct control over the money supply.

Essentially, **non-financial institutions are protected from any instabilities or failures in the financial system**; depositors are protected from issuer default (Bossone, 2002). The potential impact of the risks associated with bank assets is reduced and limited to those knowingly taking the risk.

IV.V. CONCERNS

There are a number of concerns with the narrow banking proposals. One that is particular to this form of full reserve banking is whether **there are enough safe, liquid assets compared to the amount of deposits**, and in particular with adequate maturities (Phillips, 1995; Bossone, 2002). If the number of these instruments is limited, this might put pressure on the quality of the assets to be used thereby diminishing the effect of the reform.

Furthermore, a transition to narrow banking will, according to de Grauwe (2008) necessitate **international coordination**. De Grauwe explains that banks, both narrow and investment, will be at a disadvantage to foreign banks that have not made the transition to narrow banking. Therefore, the reforms will have to be implemented in an international context such as the G20. This concern may also apply to the other forms of full reserve banking.

The transition may be easier than other plans because Narrow Banking maintains a very similar financial and monetary structure as today; however, this may also limit the positive effects of the reform as banks may still be able to create money, or at least near-monies. If these can be easily transferred to narrow banks, which still have deposit insurance, the **moral hazard and public costs** may not be removed from the system.

Other potential drawbacks of Narrow Banking are recollections of more general concerns with full reserve banking. Those specifically noted in the literature will be presented here. Bossone (2002) claims that it **undermines the key benefits of banks**: namely the creation of liquidity, provision of optimal contracts to transform liquidity and maturities, efficient provision of deposits and loans, **and the creation of money**. He claims banks are able to generate liquidity based on illiquid assets for individuals who find themselves to be 'patient' while individuals that have surplus money may not be willing to take the direct risk to lend it. This 'special intermediation' would no longer be possible under narrow banking and according to Bossone this would remove the synergies associated with simultaneous deposit and loan provision. Phillips (1995) for example mentions greater information about potential borrowers because they also have deposits at the bank and the overdraft facilities that become more difficult under narrow banking. The last concern relating to the creation of money has two components. First, there are claims

banks are efficient allocators of money in the economy. Second, Bossone claims that a credit shortage will develop if banks cannot create money – however, the narrow bank proposals allow for an increase in money and credit through the central bank. Bossone also notes the restructuring costs of the transition and whether narrow banks will be a viable industry in terms of profitability. This viability is one of the reasons why in previous proposals the deposits were simply allocated to the central bank balance. Phillips (1995) argues the financial sector might shrink in size. Finally, Bossone concludes that the safety of the narrow banking system is also only as safe as the monetary policy of the central bank. There may also still be an incentive for government to rescue ‘too big to fail’ investment banks, if the potential effects are large enough. A simultaneous sale of all ‘safe liquid’ assets may also reduce their quality thereby limiting their ultimate effect in time of crisis.

IV.VI. CONCLUSION

Narrow banking ensures current account deposits are backed by high quality liquid assets to ensure the safety of the payments system, limit the effects of bank failure, and realign risk-returns relations within the financial sector. It retains for a large part the elements of the current financial system, but alters its general structure by separating the money and credit systems. While the availability of credit can still be enhanced through central bank policy, the ultimate impact on liquidity remains debated. Furthermore, the form that the ‘safe assets’ that narrow banks are required to hold takes will also need to be stipulated quite specifically in order to ensure the reform is effective. Perhaps, like in other proposals, it is clearer to simply define a single asset type. On the other hand, it may be the strength of this proposal that it retains some flexibility in how this is filled in. It thus provides a simple blueprint that can be adjusted to a nation’s own situation, desires and needs; though as also stated, will require intensive international coordination to be truly effective.

V. LIMITED PURPOSE BANKING

Limited Purpose Banking (LPB) is advocated by Kotlikoff (2010) to reduce the risk of the financial sector as a whole. Kotlikoff claims 100% reserve or narrow banking is not enough to solve today's complex financial problems because it focuses purely on the banks' use of FDIC deposits while banks also lend from a variety of other creditors whose loans are also implicitly guaranteed due to the 'too big to fail' status of the banks. Therefore, Kotlikoff extends his reform beyond considering just money and credit.

Under LPB all financial companies *that have limited liability* can only operate as holding companies of unleveraged pass-through mutual funds. All forms of financial intermediaries are in this respect treated the same creating a more simplified system in which non are implicitly guaranteed. Mutual funds would not be allowed to borrow funds and rather require equity investments of individuals. Banks would hereby not undertake any risky behavior nor be leveraged, individuals would. LPB ensures banks merely act as intermediaries and risks are fully born by investors. In terms of the money supply, we will see this is fully controlled by government in the same manner as previous proposals: by requiring it to be fully backed.

LPB is based on the observation that the current strategy to deal with the financial crisis has significant negative implications: deposit insurance schemes encourage risky lending, bank bailouts enable 'too big to fail' institutions to take on extra risk and increasing capital requirements does not encourage more careful lending as managers, or, efforts have simply not worked such as the increase in capital requirements. While under LPB irrational collective exuberance can still result in financial instability, its effects will be limited to those that consciously partook in the related activities. Simplicity, transparency and correct risk-return relations are key for Kotlikoff.

The following sections will provide an overview of the reform proposal, with a focus on the altered relationship between banks, credit and money.

V.I. MUTUAL FUNDS

There are three types of mutual funds that will exist post-reform. The first are cash mutual funds, which actually do not buy or sell any securities, but rather fulfill the payment system function of banks. The second form of mutual funds are insurance mutual funds. The third type consist of a variety of different mutual funds that can sell any sort of investments, after which they are also named. These mutual funds take up the credit function of banks. They buy and sell securities that have been assessed by a new public institution, the Financial Services Authority (FSA).

The Financial Services Authority: This new authority will have the responsibility to appraise, rate, certify, verify, and publically disclose in full the evaluations of all securities sold (including foreign securities). All securities sold on the market by limited liability financial institutions (mutual funds) have to be assessed as such. The Authority would not ban any securities but merely be clear about what the security consists of. Private rating agencies may be utilized for a second review. The buying and selling of processed securities will occur at an auction so that the issuer obtains a fair price (low interest rate) and to encourage standardization of complex securities.

Cash mutual funds: These are mutual funds that hold only cash and are used for the payment system. They pay no interest. All banks would offer these mutual funds in their product line, competitively reducing their customer fees. These mutual funds would never "break or exceed the buck" (Kotlikoff and Goodman, 2009). The cash would be held by third parties, supervised by the FSA. This mutual fund represents the full reserve banking part of Kotlikoff's proposal. The cash held in these funds can be compared to today's current accounts. The money is accessible through ATMs, checks, or debit cards. Any deposit insurance schemes can hereby be abolished and bank runs avoided. Control over the money supply would thus entail control over the amount of currency in these mutual funds. These are at any point in time fixed, and under complete control of the central bank who can increase or decrease them as it sees fit. If the central bank desires to increase the money supply it can print money to buy assets (government bonds) held by the private sector. It could also buy shares of particular mutual funds as it sees necessary.

Insurance mutual funds: These mutual funds can take two forms. First, as tontine-type closed-end mutual funds. These funds are offered to allocate idiosyncratic risk. Shares purchased in this fund would pay-out according to the total amount collected, the mutual fund's fee and the relative amount one invested in the first place. Payment thus depends on personal and/or economic conditions, increasing risk-sharing. These mutual funds may vary in risk and return catering to different needs. The second form of insurance mutual funds are pari-mutuel closed-end funds. These funds are offered to "allocate aggregate risk via direct or derivate betting" (Chamley, Kotlikoff and Polemarchakis, 2012). The pay-out to investors in this fund depended on whether their 'bet' was correct, the total amount collected, the mutual fund's fee and the relative amount one invested in the first place. These mutual funds can also vary in risk and return.

Other: Banks would also be able to buy and sell all sorts of mutual funds. These include for example "traded equity funds, private equity funds, real estate investment trusts, commercial paper funds, private mortgage funds, credit card debt funds, junk bond funds, funds that invest in put options on U.S. Treasuries, inflation-indexed bond funds, currency funds" (Kotlikoff, 2010). Financial innovation is thus not limited under this system; mutual funds are able to buy not only individual assets, but also securitized assets. However, because all securities are required to be evaluated by the FSA it will be clear what is being bought and sold.

V.II. BEYOND MUTUAL FUNDS

Other financial institutions may develop; however, these alternative financial institutions would not have limited liability or government insurance. Shadow banks for example may operate in this way. Individuals would be allowed to buy and sell their securities outside of the mutual funds also, but banks would be restricted to brokering these transactions without holding any of the securities on their own balance sheet. Clearance would occur via an escrow service of the FSA and not the bank.

V.III. TRANSITION

The transition to LPB would occur as follows. The three types of mutual funds would need to be introduced to all financial corporations, and the FSA needs to be established. The latter can then commence to process securities and auction these off. Banks would have to transfer all their current accounts to cash mutual funds, utilizing their reserves to back these. This would happen in agreement with the account holder who could be induced to sign for this transformation through government incentives. The transition would nonetheless take time, Kotlikoff (2009) estimates about two years. Other creditors to the banks will in a similar process have to transform their deposits, certificates or bonds into investments in particular mutual funds of similar maturity. This transition is denoted as a "swap of debt for equity" (Kotlikoff, 2009) and will also require a transition period that could be sped up through government intervention. Banks will have to sell their assets and pay off liabilities, passing on proceeds to the shareholders. In terms of these changes it is a gradual transition where existing bank assets and debts mature and are subsequently recycled in a different form; however, the banks can simultaneously take up their newly allocated role.

V.IV. BENEFITS AND CONCERNS

Again, the main concerns related to LPB, as also found by the Vicker's Commission in England, are about the **credit availability and liquidity**. Credit becomes dependent on the willingness of individuals to invest in mutual funds. However, given a certain real supply and demand of credit, Kotlikoff claims the mutual funds would be able to provide as much credit as needed in the economy and maximum liquidity. Credit availability will also not be limited in quality given the mutual funds can provide investments of varying risk. In terms of liquidity, LPB does not enable banks to create liabilities in the form of deposits based on maturities that are shorter than the assets they hold. However, while current accounts may enhance liquidity and risk-sharing in times of economic prosperity, Kotlikoff claims that the risk of bank runs especially in economic downturns counters any such benefits. This liquidity benefit thus only exists in a positive equilibrium. Furthermore, the **central bank regains more control of the money supply** thereby obtaining a new tool to directly influence liquidity and actually restricting the ability of banks to reduce liquidity (e.g. during economic downturns). The **payment system would always be accessible**, unlike in the current situation and liquidity could be further enhanced via the simplification of securities. Kotlikoff also argues that the increased information about the investments through FSA evaluation and

disclosure will increase the system's liquidity. He claims it is in particular uncertainty that decreases a system's liquidity, and under this system it is in particular uncertainty that is reduced.

Another concern of the Vicker's Commission is that there would **no incentives for banks to monitor borrowers**, given they are mere intermediaries and do not hold deposits on their balance sheets. Kotlikoff has responded that mutual fund managers will earn returns purely based on the performance of the funds and thus the incentives to monitor borrowers are actually very high, especially compared to the less direct remuneration system in banks today. Mutual fund returns will provide more direct information about the performance of mutual fund managers. Furthermore, there will be **continuous monitoring by the FSA**, which will increase transparency and add additional pressure to monitor borrowers. One could question whether it is feasible for the FSA to undertake this in terms of resources and skill. In addition, the Commission claimed the modification of loan agreements would be more difficult under LPB. Again, Kotlikoff claims the contrary is true, especially because securities would be held in their entirety which enables alterations even more easily than in today's system.

V.V. CONCLUSION

Limited Purpose Banking intends to change the entire financial sector by implementing a compulsory form for limited liability companies: that of a mutual fund. The reform proposal is mainly critiqued on its influence on the efficiency of the financial system, in terms of credit provision and liquidity creation. Kotlikoff claims the increased transparency, information, simplicity and fair risk-return relations will rather restore trust in the financial system, prevent financial instability and promote economic growth.

VI. COMPARING FORMS OF FULL RESERVE BANKING

The Chicago Plan (Benes and Kumhof, 2013), Positive Money and the NEF plan (Jackson and Dyson, 2012), Kay's (2009) Narrow Banking and Kotlikoff's (2010) Limited Purpose Banking have a number of similarities, but also vary slightly in how they foresee the financial system to be organized and function. This chapter will first present the main differences between these four reform proposals. This is followed by a general analysis of the benefits and (remaining) problems and costs of full reserve banking. Alternatives are subsequently provided as a source to compare full reserve banking with, and as inspiration for other, often complementary approaches.

	Interpretation of FRB	Definition of money	Control and creation of the money supply	Control and creation of credit	Transition	Unique benefits	Unique problems
CP	Two separate private organizations: money banks (100% reserve backed deposits) and credit investment trusts (funded by treasury credit or savings).	Very broad but strict definition as the money in Money Banks, explicit referral to the need to avoid the creation of 'near monies'.	Public, independent institution.	Market determined and by public, independent institution through provision of Treasury Credit.	Requires a debt jubilee.	Reduction of private and public debt. No need for new monetary structure. Simplified central bank & government accounts.	Distributional and mentality effects of a debt jubilee. Money creation may still be possible. Simulated with DSGE model.
PM	Private commercial banks who can fund loans only by attracting savings or with own capital. All money accounts in a new system at the central bank.	Defined as the sum of all accounts at the central bank. Transfer of ownership of investment accounts not possible. Near-monies/other currencies not guaranteed by government.	Public, independent institution (MCC) determines quantity of money. Spent into the economy by government (lower taxes/debt, or more spending).	Mainly market determined but addition possible through direct lending to commercial banks by MCC and/or Δ money supply (alters amount available for investment).	Gradual pay down of conversion liability by banks (loan from central bank).	New monetary system at the central bank: effective and efficient, ensures money creation by banks impossible. Claimed social, environmental effects.	No market pressure towards innovation in payments system. Transfer risk of 'bad' loans from deposit holders to taxpayers via conversion liability.
NB	Commercial banks obliged to hold 'safe' assets equal to amount of deposits.	Not explicitly defined.	Public, independent institution through creation of 'safe' assets.	Market determined but will be altered by a change in the money supply (alters amount available for investment).	Gradual attainment of 'safe' assets by banks.	Simple transition. Flexible interpretation.	What is a 'safe asset'? Are there enough? Easy to lobby to extend this definition. Deposit insurance remains for narrow banks.
LPB	All financial institutions become mutual funds – either cash (money always there, payments function), insurance or for investment (credit function).	Cash mutual funds are the basic form of money. Any other means of payment are not guaranteed.	Public, independent institution through increase or decrease of cash mutual funds by buying/selling government bonds.	Market determined but intervention by the public, independent institution is possible by buying a stake in particular investment mutual funds.	Gradual change of status to mutual funds.	Banks run no risks – individuals do. Increased transparency as everything sold by mutual funds has to be evaluated and disclosed.	Fewer incentives for banks to monitor lending. FSA capacity to evaluate all securities.

Figure 20. Comparison of four full reserve banking proposals.

Note that in terms of the control of the money supply, in all proposals the ultimate amount of money that the economy experiences to be in circulation still always depends on the velocity of money. In the same way the amount of credit still depends on the supply of banks, supply of funding by households and the demand for loans in the market. The boundaries are merely set by the public independent institution and money remains to a large degree endogenous.

VII. PROBLEM ANALYSIS

Before considering the arguments for and against full reserve banking in general it is necessary to have a clear idea about the main financial-economic problems we are facing. This provides a basis against which to evaluate full reserve banking as an alternative system. Previous chapters and the various interviews undertaken have revealed the following main problems:

- 1. Distorted risk-return relations in particular in the public and private sector**
 - a. Safety of money dependent on health of commercial banks, bank runs possible.
 - b. Uncompetitive, concentrated financial sector such that it benefits from public guarantees (too big to fail, moral hazard due to deposit insurance).
- 2. High levels of public and private debt**
 - a. Government dependent on private sector for funding beyond tax income.
 - b. High interest payments and income redistribution from debtors to financial sector and creditors.
 - c. High private debt levels require economic activity to service and repay yielding environmental degradation (?).
- 3. Limited control over the money and credit supply**
 - a. Money/credit cycle augments the business cycle, creates financial instability.
 - b. Asset bubbles, inflation, unproductive investments.
- 4. Suboptimal allocation of money and credit**
 - a. Undemocratic creation and allocation of new money that does not consider externalities.
 - b. Bias towards collateralized investments and/or high-income debtors.
 - c. Interest burden crowds out public spending despite need for sustainable investments.

The numerous bail-outs and government interventions in the financial sector have made explicit the distorted relationship between the public sector and commercial banks. The safety of the payments system and ‘money’ is dependent on the health of commercial banks, but in order to ensure this and avoid bank runs, the government implements guarantees such as deposit insurance and intervenes when necessary. A highly concentrated financial sector benefits most from this, as individual institutions become too big to fail. Commercial institutions have passed on part of their costs, the risks, to the public sector whilst maintaining the benefits.

Meanwhile, we have seen private debt levels increase up to the crisis, at which point the public debt levels also started to increase as governments aided the financial sector. For any funding beyond its tax income it is dependent on the financial sector and other creditors, with the associated interest payments (see also bullet 4c) crowding out public spending despite the need for sustainable investments. In the private sector the interest payments on debt levels redistribute income from debtors to the financial sector and creditors, and according to some require increasing economic activity (growth) to service and repay. This growth is linked to environmental degradation, implying a link between money and the environment.

Could these high levels of debt and unproductive credit expansion have been avoided by the central bank? The endogeneity of money makes it difficult to control beyond the rather blunt tool that the central bank has: the interest rate. The central bank was also seen to go along with market sentiments. Credit and the money supply thus expanded overoptimistically during the economic boom and has now contracted excessively in time of crisis. This credit cycle augments the standard business cycle, and the associated changes in debt levels create a tendency towards financial instability. The lack of control enables the build-up of asset bubbles, inflation, and unproductive investments.

The latter relates closely to the final point – the necessity of a socially useful allocation of money and credit. One may argue an optimal allocation does not exist; however, the current system is biased towards private investments. New money is created and allocated by banks in the process of credit creation, which focuses (understandably for this process) on investments backed by collateral or to high-income debtors. Meanwhile as stated, public needs can only be met by means of tax income or government borrowing from the financial sector. Whether these issues are altered under full reserve banking is considered in the following section.

VIII. ARGUMENTS FOR AND AGAINST FULL RESERVE BANKING

Full reserve banking proposals start from the assumption that a structural change is better than changing the regulation of the current system or altering supervision and intervention. Regulation is not enough according to advocates of full reserve banking, as it will weaken over time under lobby pressures and general optimistic market sentiments. Loopholes will also always be found and the system needs to be adjusted so that the fundamentals stimulate a socially useful situation, which, if not directly achieved can subsequently be regulated and supervised. However, to start with a system that is already suboptimal and biased, places you behind from the start. More direct improvements that full reserve banking claims to make compared to the present system are described below. These each also spark various counterarguments, either because it does not solve the current problems in the financial or monetary system, because its costs exceed its benefits, or because it creates new problems. Unfortunately, these drawbacks are rarely considered in any of the four plans. Here they are presented following the arguments for a transition to full reserve banking. The analysis has been categorized in four themes:

1. **Risk-return relations;**
2. **Money is debt;**
3. **Controlling the money supply;**
4. **Allocation of money and credit.**

Arguments for and against a general form of full reserve banking are presented per theme below. It is up to the reader to consider and weigh each in coming to an opinion about full reserve banking. An additional sub-chapter on the implementation process is added as this has also triggered a number of practical concerns that need to be mentioned. From here on the accounts directly accessible to individuals, firms, and institutions for payments will be referred to as current accounts to distinguish these from the vocabulary of any of the four plans described above. Accounts utilized for savings will be referred to as investment accounts and those banks that first borrow money before lending it out will merely be referred to as commercial banks. The central institution that takes over the responsibility of money creation will be referred to as such as a general term for the various public institutions proposed in the four proposals. Any references to a central bank remain a reference to the current institution.

VIII.I. RISK-RETURN RELATIONS

Yes a Transition to Full Reserve Banking Because:

This theme focuses on realigning risk-return relations such that those that are positioned to receive a potential return also run a related risk. The focus is on the public and private sphere, as it is here that risk-return relations have been distorted. Full reserve banking attempts to split these two spheres so to allocate the infrastructure of the money system to the public sector and ensure the market does what it does best – allocate savings to loans according to highest return and lowest risk principles without any public intervention. This entails **clearer public-private divisions**, responsibilities and tasks. Both individuals and banks ‘only get what they pay for’ where the benefit is often an interest return and the cost is in the form of risk. Full reserve banking claims we need to readjust our expectations such to realize that one cannot earn a return without uncertainty nor without running a risk.

Under full reserve banking the **safety of the money and payments system** (current accounts) is dependent on the central institution and government rather than on the health of commercial banks and their willingness to trust each other. A fully liquid, trustworthy, safe and equitable electronic cash or ‘circulation money’ owned by the holder, not the bank, is created. It is based on the necessity of taxation, but with the same ease of use as bank money, a type of digital safe. This ensures there will be no bank runs on ‘means of exchange’ money, and if there are the money will always be directly obtainable. This enhances financial stability as a bank crisis doesn’t directly cause people to worry they cannot access their money or make payments. The actions, and in particular the asset quality and likeliness of repayment of assets of individual banks, no longer directly affect people’s trust in the currency, in money. The failure of investments no longer pose a risk to the payments system or currency/money. It also increases the safety, efficiency and effectiveness of the payments system as it is no longer dependent on obtaining reserves or interbank lending. Liquidity may increase as payments subsequently become faster and easier. There may furthermore be less corruption and fraud in payments as the payment system is with the central

institution and not commercial banks. These benefits of a more stable and safer payments system are based on the assumption that the government and central institution will undertake proper fiscal and monetary policy to maintain the value of the currency and ensure a democratic and stable society.

This safety is provided without government insured deposits; banks could be left to fail without potentially harming the payments system. All guarantees can be removed as current accounts are by definition safe and investment accounts are at the risk of the holder and banks. This removes the problem that the current system faces: that of **moral hazard**. Costs would no longer be public while benefits are private. This applies both to the banks and creditors, as also the latter will no longer be able to earn a return without running a risk as under the current deposit insurance schemes. Full reserve banking removes the use of risk-free savings by banks and risk-free earning by creditors. This emphasizes the point that also for creditors, it should be clear that a store of value nor perfectly safe assets exist – we always run a risk. Savings accounts (like pension funds) now claim to yield a guaranteed income, which to some is an unrealistic claim, even a lie, that should be illegal. Reallocating the risk to those who potentially earn the return, also makes it easier to let a bank fail.

This would not harm the economy as much since the systemic distrust that this would currently cause (risk of bank runs) would no longer occur. The assumption that this benefit of full reserve banking makes is that the threat of the government not to intervene is credible, at least in general (it will very likely intervene in some cases but the structural starting point is ‘hands off’ policy). This would be easier if the sector diversifies and becomes less concentrated, policy that may be complementary to a transition to full reserve banking. It may also automatically occur as banks no longer benefit from reduced costs if payments are made within the same bank (no more reserves, payments are centralized at a central institution). This **diversity**, perhaps for example also in the form of more mutual funds as Kotlikoff proposes, would also reduce the fragility of the economy and the need for government to intervene in the private sector.

Once it is made clear that banks will not be saved upon failure and that they need to attract savings in order to make loans they will **automatically start to increase capital**, creating a buffer for failed assets and thus enhancing financial stability. This increases the risk that the bank’s equity holders face, compensating for the potential revenues they can make on the loans. Subsequently, the interest rate will likely rise as creditors have to be compensated for the risk they run. Deposit holders currently do not impose a market discipline on a bank because of deposit insurance, but they should in order to counter the pressure of shareholders to minimize the share of capital. They currently see their savings as money, whether at the bank or not, which is very different to the creditors of any other firm who are clearly aware of the loan that they have extended as a creditor.

Creditors will under full reserve banking pay a **truer interest rate** (price) for borrowed savings, additionally because the interest rate is not affected by central bank interference (no longer a tool to control the money supply), nor is it distorted by government subsidies/implicit guarantees. The interest rate now only reflects credit supply and demand yielding a more stable and better signaling interest rate.

No Transition to Full Reserve Banking Because:

While full reserve banking claims to realign risks and returns in particular between the private and public sector, this makes a number of assumptions that can be questioned. First of all, the creation of a safe public payments system and money, assumes that the State is a ‘safe’ entity. However, **the State is not 100% safe** – there is always a risk of State failure and the safety (in terms of holding its value) of money remains dependent on the issuer: on the monetary and fiscal policy of the central institution and State. The value of money will always remain dependent on the issuer – 100% safe or risk free assets do not exist, nor does a store of value. One must thus question whether in this situation policy will indeed be such that money maintains its worth better than if control over its quantity lies in a fragmented, pluralist market system that spreads the risk.

An important second critique considers financial sector innovation. ‘Public money’ will reduce the amount of **innovation in the payments system**, making a 100% reserve system where the banks keep the current accounts more appealing. This is also the case because then the costs and risks associated with the payments system remain private, and one maintains the synergies associated with having current

accounts managed by commercial banks who also provide loans. Otherwise, banks have less soft information to aid them in their lending decisions and any relationships between the bank and households or firms are limited in their scope.

The sector will also likely develop all sorts of **'near-monies'** in response to the limitations of full reserve banking. There may be a very low demand for zero return money, as households and firms rather have directly accessible payments options that nonetheless give them a return in a trade-off between risk or safety, and earnings. The ability to control such developments depends on the regulatory scope of government; however, according to most history has revealed that controlling such innovation is almost impossible as technology is always a step ahead of regulation. Furthermore, since money is simply an accepted liability, any party can still create money, in the same way that firm and trade credits currently also exist. Wholesale funding and the extension of bank balance sheets by means of financial instruments/ derivative financing is still possible and the largest source of the increase in bank balance sheets today (not simple bank lending funded by deposits). An attempt to control 'money' in its broad form, as one concept, is not realistic. One could argue that the development of these quasi-monies is not important and that full reserve banking should focus itself on controlling only government created money; however, these other monies can cause asset bubbles and credit cycles, or they may develop to be so important that in case of failure the government still has to step in – precisely what full reserve banking attempts to limit. Goodhart and Gresham's Laws will also apply, and new monies may be preferred over the standardized money that the central institution attempts to control. Full reserve banking is a rather static plan that fails to consider these dynamic changes that will likely result.

Third, critics have emphasized the origins of full reserve banking such to indicate that it is a plan that solves problems that are currently of little relevance. The amount of money associated with today's current accounts and the small saver, which these plans focus on, is also far too small to cause bank runs and an **irrelevant problem** in the current financial system (compared to wholesale funding and the development of financial instruments and derivatives mentioned above for example). The safety of the payments system and bank runs were very common preceding the 1930s, but not a risk anymore. Deposit insurance schemes have solved these problems, and while the schemes have their own drawbacks such as moral hazard, these problems can be solved in other ways. Furthermore, some critics claim that the influence of moral hazard is overstated, as banks were not even thinking about the possibility of failure, let alone being aided in such an event. Finally, critics question the impact of the amount of money in the system, claiming it is rather credit that is important. It focuses on the liabilities side of the balance sheet of banks, while it is the assets side that has caused problems. Under full reserve banking you may shift a very small and perhaps irrelevant problem with money to a much bigger and relevant problem of the availability of credit (further discussed later on in this section).

Fourth, we consider the claim that government guarantees are eliminated under full reserve banking ensuring that the taxpayer is not called upon. Any funding of commercial banks by the central institution retains the risk of 'bad loans' with the taxpayer as upon bank failure they have indirectly funded the bank. Furthermore, bank runs on the credit institutions and in near-monies may still occur. If the potential effects are large enough (enough creditors affected or a potential systemic effect), these are likely to result in public intervention such that the 'too big to fail' implicit subsidy remains. This again encourages moral hazard and does not make it any easier to close down a bank upon failure. Other reasons why it may still not be so easy to close down a bank is an information asymmetry between banks about each other's assets. This is especially the case in a concentrated banking sector, with very large banks and credit portfolios. Closure may also not be needed as bank assets are adequate in the long-run, only requiring short-term aid. **Politically, the threat not to interfere is not credible.** Deposit insurance is described in the literature as a 'political fact of life'. Society simply expects such actions and there is a strong belief in 'consumer protection' with regulators when it comes to small savers: a conviction that the sector can still benefit from. This mentality is unlikely to change. Similarly, political interference to provide an opportunity for the small saver to benefit from 'risk-free saving' will likely remain. These households need to be able to increase the small amount of money they have, at a very low risk and without financial literacy. It is socially undesirable and unrealistic that individuals monitor banks. This is exactly the reason why banks developed in the process of specialization. It is unrealistic to think that the extensive education

of the public, both to enable the implementation of full reserve banking and ensure a high level of literacy such that everyone can monitor banks and understand that return equates to risk, is attainable.

It may also not be so that failures will occur less frequently because banks become more responsible in terms of their investments. This fifth critique emphasizes that banks will still be funding loans with borrowed money so that the **burden of failure remains on the bank's creditors** and less on the bank itself (i.e. its shareholders). This is especially the case under Limited Purpose Banking, where none of its activities occur on the bank's balance sheet. The lack of 'skin in the game' must according to many be overcome, as it limits the bank's incentives to monitor their loans. Instead of assuming that under full reserve banking equity shares will increase because banks need to attract creditors, critics say that higher capital requirements are needed as a more direct solution to this problem.

VIII.II. MONEY IS DEBT

Yes a Transition to Full Reserve Banking Because:

This theme is based on the observation that money has always (see Graeber, 2011), and will be, debt. This is simply the nature of money. However, depending on how money is brought about, the debt is someone else's. In the current system we utilize bank debt as money. This debt has to be repaid, most frequently with interest. Under full reserve banking, money is created by the central institution and brought into circulation through government, making it a public debt. The government does not demand repayment or interest, it simply spends the money (unless it lends it to commercial banks to lend on, in which case we are closer to the current system). This has a number of advantages.

It enables an increase in the money supply without an increase in the amount of interest-bearing, to be repaid, debt. This may be especially important in time of crisis, where an increase in the amount of money is needed to stimulate economic growth for example through employment creation, but a heavy debt burden restricts the private sector from taking on any further debt to do so. Under full reserve banking the latter is unneeded, there can be an increase in the money supply without an increase in private debts. This makes **money independent of debt** and lending: on the supply side (bank evaluation and willingness) and demand side (households, firms and the financials sector itself).

Since new money is spent into circulation by the government the public debt is reduced. Money is equity of the State, which is assumed to represent the whole of society, and opposite to the total money supply stands the productive capacity of the economy. The government is no longer dependent on financial markets or commercial banks for funding beyond their tax income. A **lower public debt** also decreases the related interest burden and crowding out of government expenditure. The seigniorage gains of money creation are allocated away from the private sector (interest margin on additional money) to the public sector. Using money creation as a tool for public spending is also publicly more easily accepted than increasing taxation (which could have the same effect) and reduces the debt/interest burden of the government. Money creation as a substitute for taxation may therefore also enable reduced (distorting) taxes. Direct monetary financing also increases transparency and accountability compared to current indirect monetary financing (central institution buys government bonds in the market).

Given currently all money requires an equal amount of debt, severing this link may also induce a **lower private debt**. This does depend on whether money is simply spent into the economy and not lent into the economy, but generally full reserve banking may also yield a lower debt burden for the private sector since a part of the money supply is not linked to credit creation / private debt.

Less debt results according to some (e.g. Lietaer, 2012) in a **reduced need to grow** with positive effects for the environment. This argument is based on the idea that interest-bearing money based on repayable debts induce a growth imperative. In the current system, it would be impossible to repay all our debts, including the interest, because there would be no money left. This encourages a need to grow economically and continuously expand the amount of debt (money) in the economy so to repay the debt with interest, or bankruptcies will result. The growth imperative induces environmental degradation, as Jackson (2009) also shows. In addition, by reducing the interest burden there is claimed to be less bias towards short-term investments, rather enabling the initial expenditure of money to be utilized for long-term investments.

In addition to positive effects on environmental sustainability, money as to be repaid, interest-bearing, bank debt also increases the amount of interest that has to be paid in society which according to some yields **income and power inequality** as it transfers money from debtors to creditors (where the latter make up a much smaller portion of society). A higher debt burden also decreases the resilience of the economy and increases its reliance on growth to ensure social stability because any fallout of growth will make it very difficult to service the debt thus yielding a higher chance of bankruptcies. This again especially impacts households and firms of lower socio-economic status, furthering inequality. See Toxopeus (2013) for more on the negative societal effects of using interest-bearing bank debt as money.

No Transition to Full Reserve Banking Because:

The first critique is a general warning that one must be aware that **money is always debt**. Since credit is the flipside of debt, money and credit perhaps cannot be separated either. Is there a money demand that is independent of a credit demand? In today's system, money is a byproduct of credit creation, but because the demand for credit exceeds that of money purely for transactional purposes (credit drives the economy), this is not a problem. By associating negative effects of interest with money, one assumes that under an alternative system the amount of credit is reduced because essentially we pay interest for access to credit, not on the money supply. Also under full reserve banking, the former will remain. Meanwhile, full reserve banking claims to enable an increase in the amount of money, for example in dealing with the current crisis, without burdening the population with more debt. By the definition of money, this may not be possible. The debt that makes money, will by definition always have to be held by someone. Most initial reactions to full reserve banking proposals are then also that 'there is no such thing as a free lunch'. Under full reserve banking money remains debt, but public debt that does not have to be repaid and is not interest-bearing. However, utilizing public debt as money yields the question as to what the State does for society to allow it to create this debt out of nothing. When banks create money they do not do this for themselves to spend, while the central institution would enable the government to do so. The individual bank has to find funding for the asset created if the created current account is spent and has to take on the related risk of the asset's failure and the central institution-government combination would not have such limitations. A concentrated sector and government guarantees have reduced the costs to a bank of money creation, but altering this could ensure that banks do not benefit 'unfairly' from money creation. It remains unclear to some why money creation by banks is a problem or relevant cause for concern.

Second, full reserve banking proponents claim the current money system requires economic growth; however, the relationship between **money and economic growth is a chicken-egg issue**. Perhaps a diminished growth in society is the cause of a reduced demand for money (fewer transactions occurring). Money in this case is not the driver, and its availability does not negatively impact for example the current crisis. An increase in the money supply under full reserve banking in times of crisis may not have any positive effect. If during a slump banks and individuals do not want to lend/borrow then you maintain the same problem as you currently have – an increase in the amount of money will still not stimulate economic growth as lending remains limited. Hennipman (1943) describes that although different systems can be implemented, ultimately, money and credit have a combined impact on society, which also depends on monetary policy and the money politics surrounding it. In this sense, one not only needs to undertake an economic discussion as to whether money creation should be centralized or decentralized, but also a political one that consciously evaluates the current and desired socio-economic control and consequences of money and credit in society as these two are inextricably linked. Analyses of full reserve banking require a deeper examination of the link between the money system (the stock economy including finance, banking, bank assets and liabilities – savings) versus the real economy (the flow economy of production and consumption). Only in this way can the effect of a contraction or expansion of the money supply be better evaluated. The causality between money, credit and growth requires a much better examination. These change very closely together, but it may be for example that the reduced growth in productivity of the first half of the 2000s was the reason for today's crisis – and the financial perspective that is currently being taken is merely a symptom.

Third, while full reserve banking claims to reduce the government debt, there are a number of **practical problems with direct monetary financing**. Depending on how frequently new money is issued by the central institution, the government faces budget uncertainty. The money available for government spending will be procyclical – increasing when times are good because of a higher level of economic

growth while decreasing in the opposite case. Meanwhile, governments rather spend anti-cyclically in order to dampen or help stimulate the economy in booms and busts respectively. This may also yield political pressure to alter the amount issued by the central institution. The independence of the central institution may reduce if the money is spent by government. The political cycle may also be seen more clearly in the money supply, resulting in suboptimal monetary policy.

Fourth, having considered government debt, the reduction of private debt under full reserve banking is also questionable. If there is a demand for credit then the **debt burden can still increase**. Based on the difference between stocks and flows, the circulation of money enables it to be lent and relent multiple times in a 'secondary debt market' to continuously increase the level of debt in the economy. Both firms and households can in this way still become overleveraged.

This leads to the fifth critique of full reserve banking in that there are **few positive effects on sustainability**. It claims to solve a growth imperative associated with the fact that money is interest-bearing debt. However, this ignores the difference between stocks and flows and assumes that the interest paid to banks is removed from the economy, while it is actually reintroduced into the economy in the form of new loans or spending by the bank. The loans associated with money creation can be serviced and repaid with a constant amount and circulation of money such that there is no need for an increase in the amount of money or debt nor economic growth. In addition, one could say that we do not pay interest on the money supply but on loans and thus a change in the form of money without altering the nature of credit will not have any effect. The link from the money system to the environmental degradation associated with growth is removed in this case. On the other hand, full reserve banking is claimed by some sustainability experts to indeed have too little positive effect for sustainability. Rather, changes related for example to property structures or strict credit guidance are required to reduce the constant drive for profit and/or employment and ensure that unnecessary investments and production are not undertaken. These allocation questions will be further considered under the third theme.

VIII.III. CONTROLLING THE MONEY SUPPLY

Yes a Transition to Full Reserve Banking Because:

Another starting point of full reserve banking, in addition to the moral hazard and source of money in the current system, is the lack of control of the money supply by the central bank. Current tools are claimed not to work. For example, capital requirements are not effective in good times as it is then easy for banks to obtain new equity or retain earnings. Reserves will also not be refused by the central bank as it could create a credit crunch or alter the interest rate, which they target. The interbank market also provides an alternative for reserves. The tool that is indirectly effective, the interest rate, is a very blunt tool that indeed affects credit but all forms of it. It also has other societal effects not considered by so-called 'independent' monetary policy, such as impacts on employment.

Full reserve banking yields **direct public control of the money supply** by the central institution, instead of the current indirect control via interest rate setting which it can leave up to the markets to establish. Essentially, we would return to quantity theory policy but now under a full reserve system in which it may actually be effective. It must be noted that this is direct control of the government money, and not of any parallel currencies or near-monies that develop. However, this is exactly the concern and focus that full reserve banking has.

Money is defined differently in the various proposals; however, in general it is the sum of current accounts (of households, firms, banks, governments, etc.) that make up the money supply thus excluding investment accounts (not directly accessible). With this concrete definition, the central institution has a stronger ability to respond and alter the money supply to changes in the economy, also in times of crisis because there would be no zero lower bound or liquidity trap possible. This could yield greater financial stability in the form of **dampened credit/business cycles** than current monetary policy, which cannot effectively counter the procyclical working of the money/credit system. Inflation can also be more directly controlled, and even zero inflation would be possible. Such price stability would enable money to hold its value and removes the necessity to continually strive for growth to ensure one compensates for the inflation rate (relates back to growth imperative above). In general, increased clarity and more

straightforward monetary goals (e.g. growth plus inflation) are possible under full reserve banking, making policy more transparent and increasing accountability.

The mandate of the central institution is also expanded to focus not only on inflation but also **include growth in its evaluations**, which makes it more accountable for the effects of monetary policy. By allocating the new money created to government any politically unwanted effects can also be more easily countered. The independence of the central institution can be placed in the country's laws (a fourth pillar of government, like the justice system) and ensured in other ways extensively discussed in Dyson and Jackson (2012). It would be independent in the same way that the central bank has an independent mandate today as well. While the central institution attains more responsibility in terms of adequately accommodating the demand for money in the economy and controlling it so to minimize business cycle fluctuations, its mandates in terms of supervising banks could be reduced somewhat since the government no longer guarantees deposits.

No Transition to Full Reserve Banking Because:

The control over the money supply relates to the observation above that it is impossible to define a single form of money. Money is merely an accepted liability and can be created in various forms. It may thus indeed be an illusion that money, as a single entity, can be controlled. However, even if full reserve banking is limited in scope to the control of government guaranteed money, there remain a number of problems with this.

First of all, both economists and central bankers have responded that there is **already adequate control over the money supply**. This initial reaction claims that it is undesirable to alter an entire system while the current set of tools available generally function well. They admit that in a liquidity trap, when the interest rate is near the zero lower bound this is not the case, but this is an exception that can be dealt with in other way. Rather, central banks already play an important role in ensuring that money holds its value, is safe, and that the payments system functions reliably. Indeed, most will admit that the available methods were not applied adequately, but given they existed, it remains the question whether under full reserve banking this would be any different.

Second, critics question whether the central institution will have the resources and capacity to forecast and accommodate the money and (unmet and creditworthy) credit needs of the public. They rather consider this extremely difficult, unrealistic and practically not feasible. Why would the central institution know better how much money and credit is needed than the market? How would they measure this? They may create too little, or too much new money. The central institution would have **limited knowledge** especially of actual and forthcoming economic growth and inflation, required for a smooth and accurate prediction. In terms of the development of asset bubbles, these have the characteristic that they are generally perceived to be based on economic fundamentals. General trends in the market may blind also the central institution, as was the case recently when there was a general tendency to think that the increase in house prices was based on economic fundamentals. Also an MCC would not be immune to such herding behavior and biases. It is very difficult to know what is a significant price variation. Some of these variations are also economically beneficial. Boom-bust cycles of technological innovation should not be removed given the benefits of creative destruction.

Furthermore, despite attempts to ensure its independence, there is always a risk of political abuse and **lack of independence**, both in relation to the government and private sector lobbying. Inflation targets may hamper this, but inflation reveals itself with a time lag and may not be directly visible, which could legitimize short-term money creation. We saw this recently in the role that governments played in the housing bubble – stimulating home ownership and high mortgages through debt tax advantages.

Such pressure will also make the central institution **limited in its actions**. It is very difficult to tighten policy during a boom for political reasons. There will be pressure from both the public (households and firms) and the government not to do so. Also under full reserve banking, no-one benefits from less credit to help this cause. Full reserve banking only pushes this problem of uncontrolled credit creation to another level. The effectiveness of control is also likely to be less direct, also under full reserve banking, than expected. The effect of the quantity of money is namely gradual and indirect due to the velocity of money and lag times in spending and lending. Money remains endogenous: dependent on the market.

Given a constant amount of lending, the money supply decreases with more saving and increases if savings decline. Only a ceiling is established by the central institution. The ability to continually adjust the money supply and directly react to the economy is a naïve idea.

Third, this limited control means that **boom-bust cycles and asset bubbles, inflation or deflation, remain possible**. This critique also relates back to a number of aforementioned problems: near monies and other financial instruments can still yield price effects and credit cycles, a buildup of debt in the secondary debt market can still yield asset bubbles, and bank runs are still possible only slower (notice periods) or at a cost (early withdrawal fines). Boom-bust cycles and asset bubbles are simply human nature, and will continue to occur also under full reserve banking due to over and under optimism of households and firms, irrational exuberance, uncertainty about the future, limited information and a naïve trust in particular innovations and developments. These are not solely a result of the money system but relate to bad assets that will still remain under full reserve banking. Inflation also has non-monetary causes, such as scarcity and competition, that are not dealt with. The existence of a current account perceived to be 'safe', may even cause new volatility and distortions in the system as in time of crisis money flees to these accounts leaving commercial banks lacking funding and at risk of failure. In the same way less supervision and regulation by the central institution may yield greater risks, if they assume that bank creditors will monitor these commercial institutions.

Fourth and finally, these problems may be avoided if instead of replacing a market monopoly with a public monopoly as full reserve banking does, we stimulate greater diversity in the money system. Full reserve banking **maintains a money monopoly**: a concentration of power over the money supply, only relocating it to a public institution. The central institution or government is not necessarily more (or less) democratic than the market. Furthermore, while the central institution can supervise and regulate commercial banks, the opposite is not possible so that under full reserve banking you may lose a system of checks and balances. Complementary currency advocates rather see an abolishment of this monopoly, replaced by an ecosystem of different currencies that stimulate smaller scale economies and create a more robust and resilient system.

VIII.IV. ALLOCATION OF MONEY AND CREDIT

Yes a Transition to Full Reserve Banking Because:

Recent events have revealed tendencies in the financial system towards asset price bubbles, speculation, price disturbances, and unproductive financial innovation and investments such as M&As. A number of mechanisms under full reserve banking are likely to act as a brake on these allocations of money and credit that are not socially useful. A reduction of these developments frees up resources from the financial sector to be used in productive sectors and may augment real economic growth. These mechanisms also put a brake on the total debt (and credit) in the economy making it less easy to indebt other economic agents, the future and nature. Any lower economic growth that results, or the development of a less dynamic economy, may also be beneficial for the environment. It stimulates a shift towards a service, repair and craftsmanship economy.

By placing the prerogative of money creation with a central institution banks can no longer expand the money supply 'out of nothing' in order to fund the aforementioned causes. Rather, the central institution can decide whether it should be expanded depending on the use of money and credit in the economy. Credit buildup and assets bubbles are placed more explicitly on the agenda of the central institution. **Restrictions on money expansion for 'unproductive' credit** will also ensure there is less super abundant liquidity / surplus capital possible, which is money created searching for a return that has real economic effects on for example house prices, commodity prices and on nature.

The principle that money must first be obtained before lending may also limit the above-mentioned speculation, bubbles, debt levels, etc. **More responsible investment by at risk creditors** may be stimulated by the awareness and engagement requested from them combined with heightened transparency of bank lending in turn demanded from commercial banks by creditors. Full reserve banking may increase the public debate and awareness about money – what is money, what do we want to fund with money/investments? Such social control may yield more productive investments, especially if banks

respond by returning to relationship banking in response to the need to stimulate the trust in banks necessary for creditors to lend their money for investments.

The main mechanism that will augment the socially useful allocation of money compared to the current system is the fact that government obtains responsibility for spending new money into circulation. The **first allocation of money by government** is according to the criteria of the public sector instead of private criteria. This eliminates the bias of the private sector towards (safer) high income borrowers or collateralized investments, limiting it to the decisions made between private parties (borrowing and lending existing money). It provides a new source of revenue for government that is intrinsically linked to society as a whole because of the societal effects of monetary expansion (e.g. inflation) to be spent on public goods. A public first allocation decision can be seen as being more democratic since the individual transactions of the current system only involve two parties: borrower and bank. Money will also always enter via the real national economy in the case of government spending and not via speculation or the financial sector. This new money could fund long-term investments that the private sector won't fund. It could be utilized in the process of financing the sustainability transition that we face thereby becoming a tool instead of a limitation. The combination of public and private investments in the economy also means there is greater diversity and resilience because if one form of investments fails, the whole system is not similarly at risk. Furthermore, any externalities of the increase in the amount of money are currently not considered. Environmental and social effects of increasing the money supply can be considered in expanding the money supply under full reserve banking. Finally, such a system also increases the sovereignty of nations as currently the only way to improve the financial sector is to increase regulation at higher levels. The assumptions made here are that the government knows the needs of the public, at least better than the market, and that politics can legitimately be directly influenced by the public domain while the actions of private institutions can be less corrected.

No Transition to Full Reserve Banking Because:

This final theme considers the claim that full reserve banking will result in a better allocation of (new) money and credit. Recall the three mechanisms that would ensure this: the control of the money supply by the central institution, forcing banks to borrow money before they can make loans, and the first expenditure of new money by government.

The first critique of this is that removing the ability of banks to create money will result in a very **rigid economic system**: a shock therapy that solves a much smaller problem. Meanwhile, society is not ready for such rigidity, it has become too accustomed to credit and the flexibility the current system offers. Savings for precautionary purposes for example are no longer directly accessible, firms can no longer receive interest over their working capital, overdraft facilities are abolished, and risk-averse individuals would no longer receive a return. Banks can no longer accommodate a demand for credit for productive investments by the creation of money. For some, this means banks no longer exist, as they do not merely intermediate between agents with and without money, but rather their money and credit creation function – the unique transformation of instantly accessible deposits into long-term loans – is a key function of banks. Banks lose their business model as two out of the three parts of the definition of a bank are lost: credit creation and enabling payments, leaving only credit allocation. Not allowing the development of financial instruments and near-monies may reduce the liquidity of the system, banks' ability to undertake maturity and risk transformations is removed, and a reduced palette of credit forms as well as current and investment accounts results.

The lack of flexibility is feared by many to result in **credit scarcity and lower innovation, efficiency, and economic growth**. The response of individuals in terms of the allocation of money to current or investment accounts is uncertain (depends on risk-return-accessibility trade-offs), but likely to result in a reduced amount of funding as current accounts cannot be used for this and use of 'the Law of Large Numbers' by banks disappears. The interest rate may increase, requiring a higher yield on loans and a further concentration on collateralized investments or high-income loans that are seen by the bank as 'safe'. Full reserve banking may actually crowd out lower return investments or SME lending as these firms cannot pay the higher interest rates further hampering real economic growth and increasing inequality. Meanwhile, the interest rate is an imperfect market mechanism to balance loans and savings because of the default risk associated with lending. Unlike the price of a commodity, there is always a risk

that you will not obtain the price of the money (the interest). If the central institution were then to accommodate any demand for money or credit we would be back in a similar system as today, and, give this institution the ability to decide on which investments would be made or not – something that also full reserve banking advocates wish to keep in the market. It is clear that the stability of funding will be key in the success of full reserve banking.

The second critique associated with the allocation of money and credit is that banks will not improve their assets if they first have to borrow money before lending. **Creditors still desire high returns** and thus there will nonetheless be a pressure towards increasing risk-taking, speculation and economic growth. The assumption that a mentality and cultural change with banks and society is possible may be a naïve hope. Competition between commercial banks will also maintain this pressure. This is in particular the case if creditors cannot correctly judge the risks they run, in which the case the demanded returns are not correctly aligned with these.

Third, one must question whether **government allocation of new money** is indeed in the interest of the public. Some reactions to full reserve banking are that the government does not represent society in its totality, nor will guarantee public goods. The current system is rather based on the idea that new money enters the economy via productive investments (albeit not in reality), not just (potentially unproductive) spending by government. The benefits of money creation should in a competitive environment be distributed by banks to creditors in the form of higher interest rates and/or borrowers in the form of lower interest rates for credit. Perhaps currently it is only the oligopolistic character of the sector that results in benefits for the banks (shareholders and employees) themselves. Better regulation on the other hand could eliminate speculative and unproductive investments. Under full reserve banking there would be no pressure for government to undertake only investment spending or channel the new money towards such growth inducing goals. Again it is this two-way interaction between money and growth that causes questions.

VIII.V. IMPLEMENTATION

This fifth theme considers the implementation of full reserve banking. There are namely a number of problems associated with this process that need to be mentioned. There are for example **transition costs** that are barely considered in the proposals. Such a structural change will require adjustments in systems, daily routines, employment and various other costs that need to be weighed against the potential benefits of full reserve banking. However, this already assumes that it can be implemented.

National politics, including both a lack of interest amongst political parties (unless it becomes extensively favored by society) and the bank lobby may prevent the implementation of such a plan. Path dependence may also prevent implementation – the system developed towards what it is today for a reason, and we cannot go back to a simplified system such as under full reserve banking. It is indeed seen by many as a plan that is far too radical and complex to implement and enforce. Such a structural change will be much more difficult and slower to implement than other smaller reforms with potentially similar effects and may therefore be disregarded. It is also unlikely that there is one simple solution for so many problems. It often comes down to a market versus public sector (government) preference, which is rarely an objective evaluation. Either way, it is currently politically unrealistic unless a war or worsening crisis develops. However, in such situations society may not be able to bear the transition costs (but when the crisis fades the need for change and legitimacy disappears). Alternatively it could come from abroad (e.g. BRIC countries) in an attempt to reduce the reliance on the market.

This leads us to consider the **international issues** full reserve banking fails to deal with. The plans all claim to be able to be implemented nationally without international effects. However, it is likely that international coordination will be needed for their implementation. This applies in particular to the EU where for example the Maastricht Treaty would need to be altered and some sort of decision rule needs to be made as to which country gets what portion of new money created. This could be done as GDP growth in that country plus an inflation target. Implementation will depend on whether the system will be self-sustaining or self-disruptive. Free exchange rates and movement of capital will have effects that are very difficult to determine due to the many variables that such a structural change impacts. Effects will occur through the demand for foreign exchange and the balance of trade. There will also be unpredictable

real effects that alter the ultimate effects of the reform, especially if done only by one nation. Unfortunately, to avoid loopholes being found, one may also have to simplify the system so much that the costs are large.

VIII.VI. CONCLUSION

In sum, full reserve banking claims to align public and private risk-return relations better than the current system by creating a safer public money system and a more diverse and resilient private sector without the moral hazard distortions of public interference. Agents with the potential to earn a return will bear the corresponding risk, and therefore influence what money and credit is used for more. Levels of public and private debt are supposedly reduced as money becomes independent of interest-bearing bank credit, reducing the related growth imperative. A more direct control of the money supply by a central institution can reduce the amplitude of the business cycle better than current monetary policy and more accurately target any inflation rate desired. This institution can be just as independent and credible as today's central bank. Central control, together with the need for banks to first borrow the money they can lend out, places a brake on the opportunities of the financial sector to cause asset price bubbles, speculate, and make unproductive investments. New money can be allocated in a more socially useful manner by the government. However, this assumes a credible threat of no public intervention if an intermediation bank fails as well as the reliability and representativeness of the government.

Whether these assumptions are realistic is questionable. In particular, it is a matter of debate as to whether the system would be more stable and allocate money better under public control than market control. It is also unsure if the effects of other financial innovations (near-monies for example) remain better contained than in the current system. Money cannot be defined as one 'thing' and it remains endogenous: dependent on market demand, the velocity of circulation and saving behavior. The new system may reduce economic growth and utility due to credit scarcity, a diminished flexibility and variety in the financial system. Unintended consequences and uncertainties about the effects of full reserve banking form large obstacles to implementation and limit the political feasibility. It cannot be experimented with and requires careful planning and full commitment to be convincing. Therefore, critics quickly refer to more traditional solutions that have similar effects but require less drastic changes. These are considered in the next section. It then becomes a matter of comparison and evaluation – does the present system enable solutions to the main problems we currently face or does full reserve banking provide enough improvement to overcome the costs, especially in terms of risk and uncertainty, that it comes with?

IX. ALTERNATIVES TO FULL RESERVE BANKING

Given these issues with full reserve banking, it is valuable to discuss a number of alternative reforms that can augment both the current system and full reserve banking. Most of these are namely complementary to both these structures. These alternatives are a compilation of proposals found in monetary and financial sector reform literature and suggested in the various interviews undertaken. Both traditional and unorthodox solutions are presented. Traditional solutions either focus on influencing the balance sheet of banks, altering the structure of the financial sector (structural policy), or improving central bank, supervisor, and government policy. Less traditional solutions are generally proposals for alternative forms of currency or money, most of which could coexist with a national government currency.

IX.I. TRADITIONAL SOLUTIONS

Bank Balance Sheet Alterations

In an attempt to strengthen the resilience of the financial sector most reform proposals focus on altering the bank balance sheet, either on the assets or liabilities side. The popular increases in capital, leverage, entrusted funding, liquidity and reserve **ratios** of amongst others the Basel accords fall under this category for example. Admati and Hellwig (2013) for example emphasize that capital requirements are not risk-weighted. The existence of safe or risk-free assets (or a store of value) may be an unrealistic assumption that has undesired repercussions for the weighting of all more risky assets that utilize these so-called safe assets as a benchmark. Other general criteria for the bank's balance sheets include **restrictions** of off-balance sheet items, non-lending assets and liabilities, and of securitized assets. Focusing on the assets side, there are proponents of returning to quantitative and qualitative **credit controls**, credit caps and window guidance (credit steering) following the model of the Asian Tigers. In such a way it is hoped that credit can be controlled and steered to more productive ends. Generally better and more **supervision** (e.g. asset quality reviews) could improve the resilience of banks. On the liabilities side **debt-equity swaps** have been proposed to reduce the debt burden in the financial sector and recapitalize banks. Alternatively, a narrower definition of an insurable deposit could be maintained with a cap on the interest rate payable for all banks, and to be held by the bank against a **high amount of collateral or capital** (Benink and Benston, 2005). More generally, **recovery plans** stipulate bailable debt and different seniorities for when a bank fails, including letting creditors such as savers bear losses. This has similar characteristics as full reserve banking, as would any reforms that force banks to hold more **'safe assets'**. However, current accounts could be detached upon failure while in normal times still be usable as flexible funding. Alternatively, banks (or central banks) could provide a **full reserve product**, where clients receive no interest and their money is not used for lending so always accessible. They do receive the benefits of an electronic bank account, but with the same feeling of safety as cash in hand. Similarly, the provision of more **mutual type funds** by banks would enable an increase in particular (e.g. green) investments at risk of the investor and without there being an increase in debt.

Structural Policy

Structural policy may also alter the basis of the system such to induce desired changes. For example, **more and smaller banks** may increase the resilience of the sector as one failure has less systemic results. This could be done by breaking up banks and/or easing the process of setting up a new bank as obtaining a licence is apparently currently almost impossible. Increasing the **diversity** through more enabling regulation may also yield alternative forms of financing. These include the development of credit unions, crowdfunding, and P2P financing. Compared to full reserve banking, cooperative banking would also make the decision about whether more money/credit should be created more democratic. Islamic banking would also reduce the problems associated with interest as these banks can rather offer a share in realized profits than a required interest. **Different separations** than money-credit under full reserve banking through for example ring-fencing (separate deposit-related services), a renewed Glass Steagall act (separate commercial and investment banks), Volcker rule (separate investment banking, private equity and proprietary trading from customer services) or the separation of banks and insurance companies are also popular alternatives. Narrow banking in a less strict non-full reserve form could also be a less extreme change than full reserve banking with potentially similar benefits.

Central Bank, Supervisor and Government Policy

Better central bank and supervisor policy may also help to avoid a repetition of recent events. This includes utilizing the tools available to the central bank more explicitly instead of relying on market discipline and broadening the scope of policy. Many argue that it is vital for the central bank to **consider asset prices** and incorporate this in their monitoring, policy and tools, such as in the CPI. It is also often stressed that more and better **supervision of bank assets** is required. Finally, some expect that a **bank union** in the European Union will greatly improve supervision in this international sector.

Others claim improved government policy could help to deal with a number of the problems currently in the system. These relate either to aiding financial stability or enhancing social and environmental sustainability. In terms of the government's influence on the financial sector, a **lower and more market conform (government) deposit insurance** would help to reduce moral hazard. Deposits could for example be required to be 100% insured in the market. Altering **bankruptcy laws** to favour debtors together with **non-recourse loans** would also put more pressure on banks to bear more risk as they would be threatened by debtors walking away from their loans (e.g. a house). Proponents of a **financial transactions tax** claim it could help reduce the volatility, instability and speculative nature of the financial system. The earnings of this tax could subsequently be spent on financing the sustainability transition. This is a first way in which government policy could alternatively alter the balance of investments in the economy towards more public, long-term sustainable investments.

Changes in the **mentality and culture** of both bankers and society may also aid this process, especially if it alters measures of 'return' or 'wealth'. There are many claims that banks need to return to being a social institution that serves the public, for both short- and long-term needs through for example more relationship banking. In relation to this are demands for more **social and long-term compensation/remuneration** structures of banks. Others claim greater education is needed to augment the public's **financial literacy** in an attempt to increase awareness about what one's money is used for. Subsequently one could implement measures that create more room for savers to decide what their money can and cannot be utilized for. In terms of sustainability, society may just need to accept a lower level of consumption, demand and economic growth. Instead of changing the money system, the government could **raise general taxes**, increase government spending and **subsidize** specific sectors. It could establish a public bank, national investment bank or vehicle to finance public investments. Taking a more market approach, it could **internalize externalities** (social and environmental costs, risks) or develop **alternative property rights** to encourage conservation and improvement of the public domain.

IX.II. NON-TRADITIONAL SOLUTIONS

Alternative Currencies

Alternative monies have also been proposed in an attempt to improve the current system in the same way that full reserve banking tries to. These depart from a similar observation that the current system of commercial bank money does not yield socially useful results and is unstable. These exist in various forms, ranging from the **demurrage currencies** of Gesell (1906) that require payment to maintain their value so to stimulate spending and a full **denationalization of money** and competition between different bank monies proposed by Hayek (1976). These currencies are introduced interest-free and are biased towards local economic activity in an attempt to reduce the power imbalances that exist in the national monetary systems (Toxopeus, 2013). The development of various **complementary currencies** and **Local Exchange Trading Systems** have been brought together by Lietaer (2012) in his argument for an **ecosystem of currencies** to increase the resilience of the system that does not exist under a monopolized currency. This could be both a robust and efficient system in combination with full reserve banking (or the current system), especially in the current information technology era. These parallel currencies could be business-to-business currencies created by large firms, social currencies that encourage social cohesion and interaction, or environmental currencies that could consciously be chosen to be used in order to promote long-term investments. An environmental currency could for example couple the money supply to the bio-capacity of the Earth or real economy along the lines of an **'Earth standard'**. Alternative to these new currencies, one could discuss whether current money as a claim on consumption/production should expire for it to be more equitable, for example between generations.

Alternative Approaches

Alternative general approaches to money have also been proposed including attempting to alter our perception of money altogether, removing the connotation of debt and rather considering it as a way to meet each other's needs. Budd (2006) for example attempts to nonetheless **separate money and debt**, stating debt is needed because our incomes are not enough to provide for our needs. Instead of going into debt, incomes should be such that everyone can satisfy their basic needs. Individuals are encouraged to spend instead of hoard, ensuring capital circulates. While rather unorthodox, such philosophical endeavours may reveal new insights to how the current system works, and could work.

Mechanism design (game theory) may be another such perspective to analyse the money system from. It considers the architectural design of systems in which the individual agents' true (socially suboptimal) needs or desires are adjusted to obtain a socially useful solution. This is particularly applicable in situations where price (market) or regulation (government) are not appropriate methods of allocation. Rather, the free will of individuals seems to be maintained, only the 'rules of the game', the structure, is altered to induce the desired results. This requires returning to the stakeholders of a system, considering their goals creatively to find a way to ensure these are fulfilled in a socially useful manner. The money and credit system may indeed be such a system, in which the individual agents left to their own devices yield suboptimal results, but, given an appropriate structural design this can be avoided. Full reserve banking could be seen as a way to encourage this, and could be evaluated using the tools and techniques of mechanism design.

X. COMPARISON FRACTIONAL AND FULL RESERVE BANKING

In an attempt to compare the current system and full reserve banking, solutions to the main problems currently facing us are considered under each system based on the pros and cons above. Many of the issues can be dealt with in both systems, and it is up to the reader to decide whether they would be less likely to (re)develop under full reserve banking, and whether they can be solved more easily under full reserve banking. New problems that may result under full reserve banking are also presented. The comparison is presented in table form.

Problems	Solutions under the Current System	Drawbacks of Current System Solutions	Full Reserve Banking as a Solution	Drawbacks of Full Reserve Banking
<i>'Safe' money</i>	<ul style="list-style-type: none"> • Lender of last resort • Deposit insurance 	<ul style="list-style-type: none"> • Moral hazard 	<ul style="list-style-type: none"> • State money 	<ul style="list-style-type: none"> • Safety of the State uncertain
<i>Moral hazard</i>	<ul style="list-style-type: none"> • Bailinable debt • ↓ deposit insurance • Capital requirements • Structural change (e.g. ring-fencing) • ↓ concentration 	<ul style="list-style-type: none"> • Lower deposit insurance socially undesirable • Capital easy to attain in economic boom – not a restriction • Bank break ups difficult and new banks risky 	<ul style="list-style-type: none"> • No deposit insurance 	<ul style="list-style-type: none"> • Political pressure to save commercial banks • Depositors cannot monitor banks
<i>Government debt</i>	<ul style="list-style-type: none"> • Increased taxation • Lower spending • Monetary financing / inflation (requires change in the law) • Growth 	<ul style="list-style-type: none"> • Politically undesirable, little public support • Costs of inflation • Growth not possible under high debt levels 	<ul style="list-style-type: none"> • Direct monetary financing 	<ul style="list-style-type: none"> • Maintaining independence of central institution, government influence / abuse
<i>Business cycle, asset bubbles, inflation</i>	<ul style="list-style-type: none"> • Capital, leverage, reserve requirements • Interest rate policy • Credit controls • Increased regulation and supervision of bank assets 	<ul style="list-style-type: none"> • Capital easy to attain in economic boom – not a restriction • Reserves will not be refused by the central bank – not a restriction • Interest rate blunt tool • Limited knowledge of supervisor/central bank/government about asset quality and credit needs 	<ul style="list-style-type: none"> • Control quantity of State money 	<ul style="list-style-type: none"> • Secondary debt market and near-monies • Irrational exuberance etc. still possible • Limitations of knowledge and rationality of the central institution
<i>Unproductive investments</i>	<ul style="list-style-type: none"> • Credit controls • Increased regulation and supervision of bank assets 	<ul style="list-style-type: none"> • Limited knowledge of supervisor/central bank/government about bank asset quality and credit needs 	<ul style="list-style-type: none"> • No monetary expansion possible by banks • Increased responsibility creditors 	<ul style="list-style-type: none"> • Irrational exuberance still possible in secondary debt market (saving/lending at investment /saving banks)
<i>Environmental degradation</i>	<ul style="list-style-type: none"> • Credit controls • Fiscal policy • Regulation 	<ul style="list-style-type: none"> • Limited knowledge of supervisor/central bank/ government about asset quality and credit needs • Fiscal policy limited by tax income& public debt • Limited regulatory scope 	<ul style="list-style-type: none"> • Money not interest bearing nor repayable • Less monetary expansion • Creditors responsible • Government spends new money 	<ul style="list-style-type: none"> • Irrational exuberance still possible in secondary debt market (saving/lending at commercial banks) and with near-monies
<i>Social income inequality</i>	<ul style="list-style-type: none"> • Fiscal and social policy 	<ul style="list-style-type: none"> • Limited regulatory scope and social support for redistribution policy • 'Rowing upstream' if system → inequality 	<ul style="list-style-type: none"> • Money not interest bearing nor repayable 	<ul style="list-style-type: none"> • Limited credit availability may augment inequality
<i>Crowding out of public spending</i>	<ul style="list-style-type: none"> • Public investment bank 	<ul style="list-style-type: none"> • Public distrust • Government incapability • Risk of unproductive investments 	<ul style="list-style-type: none"> • Direct monetary financing • Government expenditure of new money 	<ul style="list-style-type: none"> • Unproductive /inefficient public spending

Figure 21. Comparing solutions to problems under the current system with full reserve banking as a solution.

XI. CONCLUSION

The interviews and discussion sessions undertaken revealed very divergent opinions about full reserve banking. Some were fierce proponents, in the hope of stimulating in particular a structural change in the current system and its implicit mentality. Others, continue to claim that the money system is an irrelevant part of our economy and that full reserve banking fails to understand the financial system by focusing on this aspect. In general, most do agree that as is the case with the current regulatory reform agenda, there remains a danger of extensive money creation, asset price bubbles and boom-bust cycles. Therefore, there is a general willingness to consider more fundamental alternatives like full reserve banking; however, predominantly as thought experiments to find new approaches and ideas. A majority still believes that it is possible to fix the current system, without a radical change such as full reserve banking.

The structural nature of full reserve banking makes it more than just one instrument solving one problem in the current monetary, financial and economic system. Its broad scope makes it very difficult to evaluate, and state whether it truly *solves* the main problems we currently face. Rather, it is potentially an improvement upon the current system that maintains a number of problems but makes them less likely or easier to solve by means of other instruments such as regulation. Full reserve banking can provide a 'safe' form of money without government guarantees or necessary debt, that can be more directly controlled in quantity and spent by the public sector. Agents with the potential to earn a return will bear the corresponding risk, and therefore influence what money and credit is used for more. However, this is based on three assumptions. First, the public sector (government, central institution, etc.) can be trusted to better accommodate the economic, money, and credit needs of society. Second, the effects of other financial innovations remain better contained than in the current system. Third, the resulting balance between saving and lending will be sufficient to enable a well-functioning economy. While currently politically unfeasible, full reserve banking is a valuable topic of investigation in an attempt to find a new structure for our money system and obtain insights for alternative financial reform.

A number of elements of full reserve banking can namely be experimented with, or implemented, without requiring a full structural change. Banks or the central bank could for example offer an interest-free and safe full reserve account that keeps your money without lending it on. This would provide a fully liquid, safe, and electronic alternative for households and firms to cash. Deposit insurance could subsequently be abolished. Policy stimulating more mutual fund type investment funds and socially embedded banks would improve the awareness and transparency about what savings are used for. A lower deposit guarantee limit could further stimulate individuals to put their money in full reserve accounts or investment funds. Together with higher capital requirements, it could also remove some moral hazard, while credit controls could force banks to lend more to particular sectors, such as SMEs or renewable energy. In addition, the instability and lack of resilience that full reserve banking finds in the concentration of money creation with banks can be utilized in the acceptance and encouragement of complementary currencies. Finally, any 'seigniorage' type gains currently appropriated by banks could be diminished by increasing the competition in the sector (breaking up banks or easing bank license regulation) so that these go to creditors and borrowers. A package of such measures could be implemented as 'full reserve banking light', in that it implements changes from the same perspective as full reserve banking but without the necessary structural overhaul.

Other research could use experiments or surveys to investigate the response of individuals and firms to the options of full reserve banking. Faced with the options of a current and investment account, what would their allocation of today's 'deposits' be? This would also increase the awareness of the general public about money, risk and return. Furthermore, a more international analysis is required carefully evaluating the potential effects of implementation under open borders. Finally, more consensus about the effects of money is needed. There remain far too many controversial arguments in favor of full reserve banking from the perspective of environmental and social sustainability. This includes the existence of a growth imperative due to the money system or the automatic increase in income inequality that it yields. It remains unclear as to whether the current system of money as to be repaid, interest-bearing, bank debt is truly a problem because of the unclear (causal) links between money, credit and economic growth.

Money as interest-bearing, to be repaid, bank debt is not necessarily a problem. Money is always a debt and interest-bearing bank debt does not necessitate economic growth because interest is a flow that can

be paid out of income and is re-circulated by banks who make up part of the economy. However, under circumstances of a highly concentrated and short-term oriented banking sector that does not bear the risks it is taking, money as bank debt becomes a public concern. Instead of the benefits of money creation being passed on to creditors and borrowers as higher and lower interest rates respectively, it concentrates within the financial sector, benefitting employees and shareholders and inducing inequality. Market discipline ceases and banks maximize the benefits of money creation and minimize the costs (risk), creating an instable system. Full reserve banking reveals useful lessons about these dynamics. This requires an objective approach, and not an extreme conviction for or against the idea. It yields new insights about the nature of money and banking far beyond full reserve banking in an attempt to improve the responsibility of actions related to these important components of our society.

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