

## Options for reforming the financial system

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### ABSTRACT

This paper outlines four non-exclusive options for reforming the financial system. Three options are based on the re-introduction of cost carrying money supported by Gesell (1916), Fisher (1933) and Keynes (1936), but in electronic form. One variant is a government issue redeemable into official money as proposed by the US Bankhead-Pettengill Bill of 1933. A second option is to allow private issues redeemable into official money as occurred during the Great Depression. The third option involves private issues convertible into specified commodities as occurred in Europe in the 1920's. The redemption of a currency into Kilo-Watt-Hours of electricity generated from renewable resources provides a way to create "green" dollars with a stable unit of local value. Green cost carrying money could make renewable energy cheaper than burning carbon. The fourth option involves using existing fiat money to reduce: (i) the cost of seigniorage, (ii) interest on government debt; (iii) size of organisations considered too big to fail; (iv) tax incentives to favour equity rather than debt; (v) the different types of risks accepted by financial institutions, and (vi) ability of banks and "shadow" banks to create credit to finance derivatives many times greater than the GDP of the global economy.

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“Of all the many ways of organising banking, the worst is the one we have today”

Mervyn King, Governor of the Bank of England, (2010: 18)

### 1. Introduction

This paper presents four non-mutually exclusive approaches for reforming the financial system to make it more efficient, equitable and resilient.

A common feature of three of the options is the introduction of cost bearing money as proposed by Gesell (1916) for “The abolition of unearned income”. Gesell described cost bearing money as “Free-Money” as it removed the cost of interest and it could be designed to become self-financing to allow it to be given away. Suhr (1989) described it as “neutral” money because it could remove the bias to invest in financial assets rather than real assets. However many forms of Free-Money adopted in the last century adopted a cost regime that reversed the bias to make this description inappropriate.

Cost carrying money was introduced into Europe and the US described as “Stamped Scrip”. Fisher (1933) and Keynes (1936) supported Stamped Scrip because among other things it could be used to stabilise prices. Keynes referred to Gesell as “unduly neglected prophet”. In Chapter 23 part VI of his “General Theory” Keynes stated that Gesell’s had described: “the establishment of an anti-Marxian socialism” based on “an unfettering of competition instead of its abolition<sup>1</sup>” Onken (2000) described it as “A Market Economy without Capitalism”. The 2008 failures in the financial system provide lessons for financial innovators and regulators. It could supplement existing forms of money and/or provide a decentralised fallback currency in the event of another crisis in centralised monetary regimes.

One option for reforming the financial system is to introduce Stamp Scrip along the centralised lines proposed in the Bill introduced to the US Congress on February 17, 1933 by Senator Bankhead and Congressman Pettengill (Fisher 1933: 79). Today, cost-carrying money could be replaced with digital money with a built-in cost feature to make markets more efficacious. Money can now be stored on the Subscriber Identity Modules (SIM) of cell phones for distribution by either a text message or by the phone being scanned by other phones or payment points (Turnbull 2010).

Central Banks in the Philippines<sup>2</sup> and Bahrain<sup>3</sup> have approved both domestic and international transfers between cell phone owners. This confirms the speculation by Gormez and Budd (2003) that the “emergence of e-money not only reflects and supports key free banking concepts, but may be nudging modern central banking towards free banking practice”. Cell phone operators have plans for spreading their technology worldwide.

A number of scholars have considered the development of e-money and its impact on Central Banking (Cronin and Dowd 2001, Dowd 1998, Friedman 1999: 28, Gormez and Budd 2003, King 1999, Rahn 2000). As noted by the current Governor of the UK Central bank “There is no reason, in principle, why final settlements could not be carried out by the private sector without the need for clearing through the central bank” (King 1999: 48).

The second and third options for reforming the financial system are based on historical precedents. Today approval of Regulators may be required to facilitate the private issue of

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<sup>1</sup> Keynes (1936) stated: “I believe that the future will learn more from the spirit of Gesell than from that of Marx”

<sup>2</sup> <http://www.nextbillion.net/remittances-mobile-globe-cash>

<sup>3</sup> <http://wirelessfederation.com/news/zain-bahrain-launches-zain-wallet-bahrain/>

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cost-carrying money by financial innovators. The second and third options involve either: (a) a “shadow” complementary currency convertible into official money and/or (b) one or more cost carrying currencies convertible into specified commodities to create independent units of value. Section four compares a unit of value based on Kilowatt-hours (kWh)<sup>4</sup> of electrical energy from renewable resources with a gold backed currency or with fiat money.

To provide a reference for the three options described above, a fourth option considered are reforms that retain the existing form of fiat money.

Gesell (1916) proposed that money should incur a cost of 0.1% of its face value per week, equivalent to 5.4% per annum. Keynes (1936) thought that this “would be too high in existing conditions, but the correct figure, which would have to be changed from time to time, could only be reached by trial and error”. A much higher cost was imposed on the thousands of private issues of cost carrying money introduced in Europe and the US during the Great Depression as described in Section Three.

Gesell noted that the value of real assets deteriorates overtime and argued that money should do likewise to make investors neutral to owning real assets or money that at that time was redeemable into gold. Gesell was inspired by the analysis of Proudhon (1840), a contemporary of Karl Marx. Proudhon argued that it was not surplus value from production that exploited labour but the unearned value obtained by owners of money through interest payments. In the words of Gesell (1916)<sup>5</sup> in Chapter 11:

The purpose of Free-Money is to break the unfair privilege enjoyed by money. This unfair privilege is solely due to the fact that the traditional form of money has one immense advantage over all other goods, namely that it is indestructible. The products of our labour cause considerable expense for storage and caretaking, and even this expense can only retard, but cannot prevent their gradual decay. The possessor of money, by the very nature of the money-material (precious metal or paper) is exempt from such loss in commerce therefore the capitalist (possessor of money) can always afford to wait, whereas the possessors of merchandise are always hurried. So if the negotiations about the price break down, the resulting loss invariably falls on the possessor of goods, that is, ultimately, on the worker (in the widest sense). This circumstance is made use of by the capitalist to exert pressure on the possessor of goods (worker), and to force him to sell his product below the true price.

Keynes (1936) stated: “The idea behind stamped money is sound” and explains “Gesell’s contribution to the theory of money and interest” in the following way:

In the first place, he distinguishes clearly between the rate of interest and the marginal efficiency of capital, and he argues that it is the rate of interest which sets a limit to the rate of growth of real capital. Next, he points out that the rate of interest is a purely monetary phenomenon and that the peculiarity of money, from which flows the significance of the money rate of interest, lies in the fact that its ownership as a means of storing wealth involves the holder in negligible carrying charges, and that forms of wealth, such as stocks of commodities which do involve carrying charges, in fact yield a return because of the standard set by money.

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<sup>4</sup> A suggestion put forward by Turnbull (1977).

<sup>5</sup> Other quotes from Gesell (1916) are: “Must money always remain what it is at present? Must money, as a commodity, be superior to the commodities which, as medium of exchange, it is meant to serve?” (Introduction); “Money becomes useful only when it changes possession, when it serves as a medium of exchange and circulates” (Chapter 10); “One of these apparently trivial facts, which has, up to the present, been totally overlooked, is that the nature of our traditional money allows demand (the offer of money) to be delayed from one day, one week, one month, one year to another whereas supply (the offer of wares) cannot be postponed a day without causing its possessor losses of every kind” (Chapter 11).

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Fisher (1933: 64) describes how the “pump priming” of the US economy in 1932 by the Federal Reserve failed because its approach “was conceived *for the producer, not the consumer*” (Italics in the original text). He goes on to say “this is precisely where Stamp Scrip comes in – to give buying power to the consumer, *and supply the compulsion to use it.*” Fisher also notes that it discourages “the banks from hoarding cash – ‘to keep liquid’ as they prefer to express it.” This use of cost bearing money again has relevance as a way of “reinflating” an economy described by Fisher (1933: 61).

Fisher (1933: 68) noted that Stamped Scrip “would be the best regulator of monetary speed, which is the most baffling factor in stabilizing prices”. This was an intention of Gesell (1916) who stated: “The Currency Office is, however, bound to adapt the issue of money to the needs of the market in such a manner that the general level of prices remains stable.” In this way, Stamped Scrip could provide an influential monetary tool for governments to augment the impotence of Central Banks analysed ten years ago by Friedman (1999). Impotence demonstrated in the aftermath of the 2008 financial crisis with the introduction of “quantitative easing”.

Stodder (2005) provides empirical evidence that privately organised complementary exchange systems in Switzerland and the US increases macroeconomic stability. The Swiss data is from the Wirtschaftsring or WIR (Economic Ring) founded in the 1930’s and the US data is from the International Reciprocal Trade Association (IRTA) founded in the early 1970’s.

Gesell envisaged Free-Money being issued by the central government to completely replace existing paper money. This would profoundly change the operations and cost of both the financial system and the real economy. It would reverse the process described as “Financialization” that according to Palley (2007):

transforms the functioning of the economic system at both the macro and micro levels. Its principle impacts are to (1) elevate the significance of the financial sector relative to the real sector, (2) transfer income from the real sector to the financial sector, and (3) contribute to increased income inequality and wage stagnation.

Some of the Macro and Micro implication of the general adoption of cost bearing money are considered in the following Sections.

Cost bearing money was introduced on a private decentralised basis in Europe with many variations in thousands of communities after the First World War. In the US, Stamped Scrip spontaneously and suddenly spread across the nation on a decentralised basis by local government agencies or Chambers of Commerce during the depth of the Great Depression. Fisher (1933: 33–42) documented a number of different forms of Stamped Scrip in the US and Europe.

The rapid spread and varieties of Stamped Scrip raises fundamental questions on the design of the monetary system as raised by King (2010: 18) that are summarised in Turnbull (2009: 353) with some aspects outlined below. For example: Should banking be organised on a decentralized “Free Banking” basis and/or governed by a Central Bank? Should the creation of money and credit be: (a) by the government; (b) by the banking system and/or (c) “Denationalised” as proposed by Hayek (1976b)? Should there be competing currencies as proposed by Hayek (1976a) to control inflation? Should money be convertible into specified goods and/or services?

The Second Section briefly outlines how the nature of money and the financial system has changed over the years to provide a context for considering policy options for further

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changes. The Third Section explains Stamp Scrip and presents the options of a centralised government issue or decentralised private issues. The option of money being redeemable into one or more commodities is considered in Section Four. The concluding Section Five considers design features for developing a more efficient, equitable and resilient financial system with or without cost-carrying money.

### 2. Changes in the structure of Money and Banking

The nature of money and banking has undergone radical changes since its early evolution. The future of money was considered ten years ago by the Governor of the UK Central Bank who raised the question: “Will future historians look back on central banks as a phenomenon largely of the twentieth century?” (King 1999: 47).

Cost bearing money is as old as the invention of money. Suhr (1989: 110) recounts how “In Ptolomean Egypt, peasants delivered their grain to public storehouses and received certificates of deposit” that recorded the time of delivery and the quantity and quality of the grain. The “certificates” commonly scratched on shards of pottery could be transferred to bearer and so took on the role of money as a store of value and medium of exchange with the quantity and quality of grain being the unit of account. However, at redemption of the deposit note into grain deliverable on demand, a storage and maintenance fee was deducted and in some cases also a tax.

Unparalleled prosperity in Europe from 1150 to 1350 was associated with use of thin silver coins described as “bracteates” that were periodically re-issued to possess a limited life like Stamped Scrip (Suhr 1989: 111). Until the last century, money was defined in terms of a commodity. Warehouse receipts for the commodity became deposit notes redeemable on demand or promissory notes for delivery in the future. Bankers were also merchants like the 15th century Medici family in Italy. Merchant Banking became an integral part of the US financial system where tobacco was recognised as legal tender from the 17<sup>th</sup> to 19<sup>th</sup> Century, a longer period than gold (Galbraith 1975: 48). Banking, like money, developed on a decentralised basis. Such “Free Banking” was widely practiced until the 20<sup>th</sup> Century (Dowd, 1992, White 1993).

In the past there existed in many regions a “Choice in Currency” as advocated by Hayek (1976a) for controlling inflation. Various commodities were used as currency such as gold, silver, copper, tobacco, cattle, salt, and tea (Galbraith 1975, Davies 1996). Merchants/private banks in the US developed the practice of issuing paper money that could be redeemed into the commodity used to define their unit of value (Galbraith 1975). The case for redeemable money described as “natural” money is described by (Smith 2009).

Centralized banking became established in 18<sup>th</sup> Century England and spread around the world. The purpose of the English Sovereign granting a single private bank monopoly rights to issue paper money in a specified region of England was to obtain loans for financing the government. In this way the practice was established for a privately owned bank to make profits described as “Seigniorage<sup>6</sup>” from creating money or credit (non-cash money) and then earning interest on the money created by lending it to the government.

The creditability of modern industrialized central governments with their taxing powers now makes obsolete the need to grant such monopoly rights to private bankers who charge interest

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<sup>6</sup> In this paper the word “Seigniorage” will be use to describe the net revenue derived from the issue of coins, currency notes as well as non-cash money be it a bank deposit or the facility to drawdown a bank loan.

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on the non-cash money they create. Today, it is only governments who can define the nature of “legal tender” not private or government banks or even central banks. So it is only a government or its licensees who can create legal tender and define what legal entities can be a bank.

The privilege of the privately owned English Central Bank being given rights to make profits by creating credits was partly mitigated when the Bank of England was nationalised in 1946. However, in 1913 the English structure became a role model for private bankers in both Europe and the US to advise the US Congress to form the Federal Reserve Corporation<sup>7</sup> as a privately owned entity (Griffin 2002).

For over 20 years, Congressman Wright Patman tried to repeal of the Federal Reserve Act of 1913 so as to remove the privilege of private bankers making monopoly profits from creating legal tender and then lending it to the government. Patman (1941) was chairman of the US Congressional Committee on Banking and Currency for 40 years and explained his concerns in the following way:

When our Federal Government, that has the exclusive power to create money, creates that money and then goes into the open market and borrows it and pays interest for the use of its own money, it occurs to me that that is going too far. I have never yet had anyone who could, through the use of logic and reason, justify the Federal Government borrowing the use of its own money. I am saying to you in all sincerity, and with all the earnestness that I possess, it is absolutely wrong for the Government to issue interest-bearing obligations. It is not only wrong: it is extravagant. It is not only extravagant, it is wasteful. It is absolutely unnecessary.

The monopoly rights established by governments to determine who can create money are protected in the US by the Secret Service that was formed for this purpose in 1865 as a division of Treasury. To counter monopoly control of money by governments, Hayek (1976b) argued for the “Denationalization of money”.

Currently, governments have adopted “fiat” money that cannot be defined in terms of anything real since President Nixon took the US off its attenuated version of the gold standard in 1971 (Galbraith 1975: 48). *The Economist* (1990) described fiat money as “funny money” in discussing the introduction of the Euro. It questioned if the Euro should be backed by commodities. Without the need to store and/or insure gold, silver or any other commodity as a “hard” currency, the carrying costs of holding money, described as “demurrage”, has been eliminated.

Today, governments and their central bankers have introduced a radically different form of money because: (i) What can be used as money is determined by the government not private interests; (ii) Governments rather than private interests determine who can issue money; (iii) Central Banks determine the minimum cost of risk-free non-cash money; (iv) The ability of interest rates to indicate the degree of risk is distorted by the cost of risk-free credit; (v) A bias has been created to own financial assets rather than real assets; (vi) The value of money can no longer be defined in terms of anything real and so money lacks any direct market

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<sup>7</sup> The US Federal Reserve Act created the Federal Reserve Corporation owned by private shareholders but with its Board members appointed by the US President. All profits of the Federal Reserve System represent seigniorage and all such profits are distributed to the private investors who own shares in the system. The profits arise from (a) tax payers who fund the interest cost of the US debt financed by the Federal Reserve System and (b) interest received on other non-cash money created by the Federal Reserve Corporation described as “reserves” that are used to fund the 12 Federal Reserve Banks that in turn are used to create additional non-cash money (Schauf 2008).

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feedback on activities in the real economy; (vii) The need and cost of holding a reserve currency has been eliminated; (viii) There is now no common standard of value like a specified commodity to determine the relative value of foreign currencies that are determined by a complex interplay of trade, investment and lending flows, derivatives and the monetary policies of foreign countries.

The disconnection between modern money and the real economy is seen as a contributing factor to the 2008 financial crisis. As noted by Williams (2008):

The biggest challenge in the present crisis is whether we can recover some sense of the connection between money and material reality – the production of specific things, the achievement of recognisable human goals that have something to do with a shared sense of what is good for the human community in the widest sense.

Governments earn seigniorage from the issue of coins and notes at a value above their cost to produce. However, the value of coins and currency notes created by the government represents only minor fraction of the money supply. Governments have licensed out the manufacture of most non-cash money to private banks. As a result governments lose the ability to earn the substantial seigniorage from the creation of non-cash money as reported by Huber and Robertson (2000). In addition, governments who then borrow money contribute to the seigniorage earned by the private sector that concerned Patman.

The manufacture of credit can create a profit from the interest charged to the borrower being higher than the interest paid on the deposits created by the new credit. The profits created by UK banks from the government licence to create non-cash money has been estimated by Huber and Robertson (2000: 89) to be 15% of the UK tax revenues in 1998–9. This magnitude is consistent with UK Banks being responsible for contributing more than 25% of the value of all shares listed on the London Stock Exchange before the financial crisis in 2008.

The cost to the economy of privately earned seigniorage would be eliminated by credit creation being undertaken by the government instead of by the banking system (Fisher 1934; King 2010). The role of the banking system would then become one of simple intermediation of converting short term deposits to longer term loans as traditionally undertaken by credit unions, building societies and savings and loans associations. The cost of the banking system would be substantially reduced to allow more resources to be diverted to increasing output in the real economy. The problem that concerned Wright Patman would be removed as governments could finance their deficits by creating credit instead of going into debt and paying interest. However, this raises the problem of how to constrain governments from debasing the currency with excess credit creation as discussed later.

Like in the UK, US financial institutions also represented around 25% of the total market value of all stock on the New York Stock Exchange in 2007. In Table 4 of Palley (2007), the output of the US Finance, Insurance and Real Estate Sector rose from 15.2% in 1979 to 20.4% of GDP in 2005. There would appear to be an opportunity, like that in the UK, to substantially reduce the cost of the financial sector by removing the ability of the private sector to earn seigniorage. A reversal of the financialization process to its 1979 level would result in a 25% reduction in the resources used by the financial sector to service the real economy.

The UK and US statistics indicate the potential for substantially reducing the cost of servicing the real economy with services from the financial sector by reforming the architecture of money and banking. How much more productive in terms of non-financial services might

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economies become if the private banks did not possess the privilege of making profits from creating non-cash money that is a public good? How much smaller would the finance sector become if non-cash money were created only by the government as was proposed by Patman (1941) or by those who created value through trading and investment as occurred before fractional banking spread in the 17<sup>th</sup> century and facilitated by the emergence of central banks providing lender of last resort facilities.

Friedman and Friedman (1985) proposed an amendment to the US constitution to allow the executive government to create credit as this was supposed<sup>8</sup> to forbid the issue of currency notes without the approval of Congress. They envisaged that money created by the government would be controlled along the lines described by Friedman (1961), Friedman and Schwartz (1971: 566), Griffin (2002: 573), Huber and Robertson (2000: 9), Marx and Engels (1848) and supporters of the US Monetary Reform Act (2008).

A compromise proposal has been developed in the US described as the “State and Local Government Economic Empowerment Act – HR1452”<sup>9</sup>. The Act represents what this author describes as “selective” monetary policy as it provides credit without an interest cost for nominated purposes. Selective money policy<sup>10</sup> provides one way to eliminate the finance cost of investments that Moulton (1935) describes as being “procreative property”<sup>11</sup> or more specifically reducing the price of renewable energy below that of burning coal as discussed in Section four.

The basic idea of the money reformers is to remove the power of banks to create non-cash money through increasing the size of their balance sheets by creating loans and deposits. This practice is described as “fractional” banking as the Bank’s equity becomes only a fraction of total deposits. Government regulators generally require the degree to which banks can multiply their equity for making loans to follow the guidelines of the Bank for International Settlements (BIS) based in Switzerland.

The termination of fractional banking as discussed by Fisher (1934), Friedman (1960), Tobin (1987), (Kay 2009) and King (2010) would mean that commercial banks could only lend funds that they obtained as equity and/or attracted in the traditional manner of credit unions, building societies and savings banks. Instead, governments would create credit by increasing the issue of currency notes or what Friedman and Friedman (1985) describe a “non-interest bearing non redeemable obligations”. Another option would be for credit to be created in the private sector by merchants and investors (Turnbull 2009).

Shauf (1998) and the Monetary Reform Act (2008) propose that non-interest bearing notes be used to redeem interest bearing obligations of the US government to eliminate the need for taxpayers to service the government debt that concerned Patman (1941). As the interest paid

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<sup>8</sup> Galbraith (1975: 68–9) records the issue of non-interest paying Treasury notes small enough to become hand to hand currency during the 1812–14 war and the issue of “Greenbacks” during the Civil War. White (1987) explains why non-interest-bearing currency is generally accepted.

<sup>9</sup> The objective of the *State and Local Government Economic Empowerment Act – HR1452*, is introduce what is described as a “Sovereignty Loan Plan” to remove the cost of interest/seigniorage in funding local and state government infrastructure assets than can become self-financing from the revenues they produce. Refer to <http://www.cbo.gov/doc.cfm?index=4630>. As interest payments over 20 or more years can more than double the cost of a project, Sovereignty loans could substantially reduce the cost and so the price charged for such services to reverse inflation (Kennedy 1988).

<sup>10</sup> Selective monetary policy would be facilitated by the emergence of “smart money” created by digital e-money technology. Smart money could carry additional information besides a unit of value.

<sup>11</sup> Moulton (1935: 10–11) defines “procreative property” as “the processes by which society expands its power to make nature yield its resources more abundantly”.

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on US government bonds represents around 15% of tax revenues in recent years, US taxes could accordingly be reduced. As the economy expanded and required additional credit, this would be supplied by the government. The government could then use the profit or seigniorage created to reduce the need to raise tax revenues as calculated by Huber and Robertson (2000: 89). The option of using credits created in the normal course of trade and investment and described by Turnbull (2009) would also remove the burden of a seigniorage cost for the real economy and the cost of “financialization”.

In recent years, the credit created by commercial banks has been overshadowed by the credits created by investment banks to financial derivatives. The ability of these “shadow banks” to create synthetic derivative paper assets has arisen through de-regulation of the UK financial markets in the 1980’s and the partial repeal in 1999 of the US Glass Steagall Act.

*The Economist* (2008) reported that “The derivative markets have grown at a stunning pace” with the total value of derivative contracts increasing from 2.5 times global GDP in 1997 to 11 times global GDP in 2007. The asset bubble created by synthetic assets has been matched by *real* liabilities that reduced the fraction of equity in investment banks to insignificant values. The value of derivative assets is much more volatile than bank loans. This introduces instability in the financial system and exacerbated problems that led to the failure in 2008 of a number of commercial, investment and mortgage banks.

There exists a need not to just patch up the existing system but to redesign it so its architecture makes it much less costly in servicing the real economy. By reversing the recently developed process of financialization (Palley 2007) the financial system could also become more resilient and equitable in the distribution of income and wealth. One technique for reversing the process of financialization is by the introduction of complementary and/or a cost bearing currency as considered in the following Section.

### 3. Cost bearing money

The idea of introducing a usage charge on paper money was developed by Silvio Gesell, a successful German merchant who first published his ideas in Buenos Aires in 1891 and later in Germany. He retired to Switzerland and published in 1916 a book whose English version is titled *The Natural Economic Order*.

After the First World War a friend of Gesell began issuing in Germany a cost bearing currency note. It was described as “Wära” a word compounded from “Wäre” and Währung” which mean respectively “Goods” and “Currency” (Fisher 1933: 18). This “merchant currency” influenced the ideas of Rudolph Steiner who described it as “decaying” or “rusting money” (Preparata 2006) because the note lost all value unless a stamp was periodically purchased from the issuer and attached to the back of the note. As a result the scrip changed hands quickly so it became known as “speed money” as well as “Stamped scrip”, or “neutral money” (Suhr 1989). Adoption of Free-Money spread from Germany to Austria, Switzerland, France, Spain and the US (Onken 2000: 11–5).

The initial issue of Wära only required a stamp of 1% per month. In the US a stamp of 2% a week was used in some communities. This allowed the issuer to raise revenues of 104% of the face value of the note over a year to make the money self-financing. It allowed the issuer to give away the notes yet redeem them for full value after making a 4% surplus to cover the cost of printing the notes and stamps. If the notes were used in exchange for official currency the profit from seigniorage would become 104% per year of the money issued.

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A precedent for giving away money is referred to by Galbraith (1975: 53) who records how the US State of Maryland in the 18<sup>th</sup> Century issued money like a dividend to each taxpaying citizen. However, unlike the Maryland issue or the Social Credit distributions proposed by Major Douglas (1924) a smaller volume of cost-carrying money is required to stimulate economic activity as it circulates much faster. As the speed of circulation increases the average cost per transaction decreases unlike credit card charges. Even with a 2% cost per week, Free-Money becomes less costly than credit card charges that typically cost more than 2% per transaction. Stamped scrip circulated in the US around ten times faster than official money according to the data provided by Fisher (1933: 48). This indicates the paradoxical potential of a cost carrying currency to reduce transaction costs of the financial system.

In 1931, Wära redeemable into coal was issued by the owner of a bankrupt Bavarian coal mine to pay his employees to re-commence operations. Note holders could redeem their notes on demand for coal or pay a 1% fee per month to the issuer for storing the coal. This was at a time of hyperinflation and unemployment. Within a couple of months the coal backed issue “provided work, profits and better conditions for the entire community” (Fisher 1933: 20). As a result the use of the Wära rapidly spread to over 2,000 firms in Germany using various commodities for its backing. This threatened the power of the German Government who introduced an emergency law to stop the issue of Wära in 1931 after they failed to achieve this end through the courts.

However, the Mayor of Wörgl in Austria then took up the idea in 1932. The Wörgl note issue was redeemable into Austrian Schillings deposited in a Trust Account. Redemption into Schillings would cost 2% but it would only cost 1% to hold the note for another month. The Mayor and other municipal employees had at least half their wages paid in Wörgl notes. It was a great success with back taxes collected and public works being undertaken valued at many times more than the value of the notes issued (Fisher 1933: 24–29). Over 200 cities in Austria soon began issuing their own notes. This led the Austrian Central Bank to terminate the use of local privately issued currency notes.

Similar success and government repression occurred in the US after Stamped Scrip began being introduced at the height of the depression in 1932. Fisher (1933: 30–44) records its spread and describes its various forms in Hawarden, Iowa; Evanston, Illinois; Russel, Kansas; Rock Rapids, Iowa; Albia, Iowa; Granite Falls, Minnesota; Nevada, Iowa; Pella, Iowa; Mangum, Oklahoma; Eldora, Iowa; Jasper, Minnesota; Merced and Anaheim, California; Lexington Nebraska; Enid Oklahoma and Knoxville, Tennessee.

A Bill was introduced into the US Congress on February 1933 for the issue of one trillion dollars of stamped scrip to revitalize the economy (Fisher 1933: 79–83). The scrip was to become legal tender and distributed to each State in proportion to their population. Recipients then had to affix a two-cent postage stamp to each one-dollar note of scrip each week. After 52 weeks the notes could be redeemed at any Post Office into currency notes, which were then backed by gold. The 4% seigniorage profit from the note issue would have raised \$40 million for the government owned Post Office while helping to get the economy going again.

However, there was no role for the Federal Reserve System in the creation of this very substantial credit facility. The issue of a cost carrying currency by the government would have diminished the relevance of the Central Bank and giving encouragement to those seeking to repeal the Federal Reserve Act. The Bankhead-Pettengill Bill of February 17,

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1933 would have been of critical concern to the private and very influential shareholders<sup>12</sup> of the Federal Reserve System, as it would diminish their income, power and influence.

And so it was that a few weeks later on March 4<sup>th</sup> 1933, President Roosevelt announced the "New Deal" which temporarily closed all banks and prohibited the issue of all "emergency currencies". By then many communities were issuing various forms of stamped scrip. Keynes (1936: 234) supported the use of stamped scrip by stating:

Those reformers, who look for a remedy by creating artificial carrying cost for money through the device of requiring legal-tender currency to be periodically stamped at a prescribed cost in order to retain its quality as money, have been on the right track, and the practical value of their proposal deserves consideration.

Consideration of cost-carrying money is now appropriate again with the possibility of new problems emerging in the financial system. This has created an intellectual climate to reconsider and reappraise deep-rooted habits of thinking. The need for a new financial architecture has existed since Patman (1941) raised the question as to why governments should pay interest on the money they can create. King (2010: 18) supported for need a new architecture was raised by stating: "Of all the many ways of organising banking, the worst is the one we have today".

As described above, history provides evidence that cost-carrying currencies can be introduced in parallel with national currencies, even if they are gold backed. So there is no need to make an all or nothing change. Alternative monetary arrangements could be introduced to trial new systems in the spirit of Hayek's arguments for a "Choice in Currency". In this way a fall back system could be developed in case more serious defaults emerge using the existing official fiat or monopoly "funny money" system.

One problem is that permission may be required by the keepers of the existing system to roll back their power to define the nature of legal tender and what can be used as money<sup>13</sup>. The history of alternative types of money discussed above indicates that those in authority will resist changes to orthodoxy. A breakthrough to adopting a heterodox system may tragically need to wait until there is breakdown of the existing system.

In recent years there has been a revival of what are described as "complementary currencies", "local currencies", Local Employment and Trading Systems (LETs), Time dollars and barter schemes.<sup>14</sup> A global map of these initiatives with a description of them is posted on the web pages of the Complementary Currencies Resource Centre<sup>15</sup>. The tradition of Germany being an innovator in alternative currencies is being maintained with it hosting most initiatives, encouraged by the support of Margrit Kennedy (1988).

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<sup>12</sup> Shareholders included: Chase Manhattan Bank, Goldman Sachs, Lazard Brothers, Lehman Brothers, Rothschild, Warburg and individuals such as J.P. Morgan, William Rockefeller and Paul Warburg (Schauf 1998).

<sup>13</sup> The legal situation in the US is described by Solomon (1996: 95–127).

<sup>14</sup> Some of these initiatives, such as "Ithaca Hours" (<http://www.ithacahours.org/directory.php>) in New York State, and "BerkShares" ([www.berkshares.org](http://www.berkshares.org)) in Massachusetts arose from their founders attending one of the five residential six-day seminars presented to community activists in various locations in the US by the E.F. Schumacher Society from 1982 to 1984. The Society obtained permission from the Comptroller of the Currency and the Secret Service to carry out monetary experiments at that time through the assistance of the Chairman of the Society, John McClaughry who was also then the senior domestic policy advisor to President Regan. The notes of the seminar presenters were published by Morehouse (1997).

<sup>15</sup> Refer to <http://www.complementarycurrency.org/ccDatabase/maps/worldmap.php>

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From the complementary currency web site it is difficult to determine if any of these initiatives create an independent objective unit of account except for “Liberty Dollars”. With this exception complementary currencies represent a barter system of human labour or “shadow” money that defines its value in terms of the local fiat currency. However, besides promoting local community economic activities, self-help and retaining wealth within a community these initiatives have introduced a wide spread community awareness and knowledge of alternative exchange systems. In this way many citizens have become educated about alternatives.

Bernard von NotHaus established Liberty dollars in 1998 as a self-described “Monetary Architect”. Before the Liberty Dollar home page<sup>16</sup> was removed by Court order some time in 2010, it stated that their dollars were “100% backed and redeemable into gold and silver” as “America’s inflation proof money”. In November 2007 dawn raids by the Secret Service and the FBI at its four locations confiscated the operating assets of “The Liberty Dollar”. The government obtained a second six-month stay of proceeding in October 2008. In May 2009 the Liberty Dollar web page stated: “Liberty Dollar is a private voluntary currency that protects your purchasing power. It is not intended for use as ‘Legal Tender’, ‘Current Money’ or ‘Coin’”. The web page pointed out that Federal Reserve Notes had lost 96% of their value since they were first issued in 1913. On July 31 2009, NotHaus and associates were charged with federal crimes<sup>17</sup> and were imprisoned in 2010<sup>18</sup>.

Liberty dollars raises the issue of the need for money to be redeemable into real assets that Solomon (1996: 76) thought “essential”. Consideration of this question is taken up in the following Section.

### 4. Choice in currency?

This Section compares contemporary fiat “funny” money with a gold backed currency and a currency whose value is defined in terms of kWh of electrical power *generated from benign<sup>19</sup> renewable sources*.

A currency backed by a basket of commodities consumed in its host community is generally considered the most desirable basis for defining a unit of value whose purchasing power remains constant (Fisher 1911). Former Belgium Central Banker, Bernard Lietaer (2001) has proposed a global currency described as a “Terra” backed by a basket of world commodities. Ralph Borsodi in 1973 introduced a local currency described as a “Constant”, based on a basket of commodities in Exeter, New Hampshire (Boyle 2002: 202).

As noted by Boyle, the problem of using commodities is that their consumption changes over the seasons and over time and also from technology that changes the composition of goods and services. Some food commodities would be difficult and/or expensive to store so that any demands to redeem the currency into its constituent commodities might not be met. If the mix of commodities lost its alignment with the value of its constituent parts then an incentive could be created to redeem the currency to profit from selling its components.

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<sup>16</sup> Refer to <http://www.libertydollar.org/>

<sup>17</sup> [http://en.wikipedia.org/wiki/Liberty\\_Dollar](http://en.wikipedia.org/wiki/Liberty_Dollar)

<sup>18</sup> <http://tekgnosis.typepad.com/tekgnosis/2010/08/bernard-von-nothaus-of-liberty-dollar-fame-is-jailed.html>

<sup>19</sup> Some sources of renewable energy can produce severe environmental impact such as in bio fuel production and when breakdowns occur with nuclear reactors.

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Another problem in using a basket of commodities is that many can have considerable variations in quality that can alter its value to users. Some quality characteristics are difficult to define and measure. The purity of metal commodities can be more easily defined, measured and maintained than the characteristics of tea, tobacco or cattle and so on which have in the past been used as money. Another problem is that some commodities can substitute for others. “Green” dollars redeemable into kWhs generated from renewable energy sources provides an unit of account that can be measured as precisely as required.

Besides being a unit of account, money also carries out the role of being a “medium” of exchange and a “store of value”. However, fiat money no longer carries out its historical role in providing a physically definable “unit of value” like a pound weight of sterling silver or a defined weight of gold. There is now no contractual connection and so no direct market feedback mechanism between money and the real economy and its environment. A visitor from another planet would be puzzled why our society uses fiat “funny” money as a “message stick” to allocate real resources when the price being conveyed is not connected to any real resource? The puzzle would be compounded when the visitor noted that the ability of money to earn interest meant that its value increased without any obvious direct relation to economic activities (Turnbull 2009).

Advanced economies are highly dependent on the consumption of energy. Energy consumption closely correlates with total economic activity in most countries. Substitutes will be increasingly required for non-renewable sources of energy like burning carbon in the form of oil, coal and natural gas. Prices can be expected to increase as the most accessible non-renewable energy sources are depleted and/or their extraction becomes more costly.

Wind to power electrical generators may be available on average for only 30% of every 24 hours while solar generators may only obtain power for 20% of each 24 hours. As a result the investment cost for each kWh produced *on a continuous basis* from wind and solar generators can become three to five times greater than the investment cost of coal fired generators. The cost of financing investment in renewable energy becomes the most significant determinant of its price. In many regions of the world renewable energy could be supplied at a lower price if the cost of finance was eliminated (Turnbull 2008c). For those that believe that burning carbon is the source of global warming, the need for taxing carbon or introducing carbon trading could be largely removed by a financial system that provided interest free money.

So while a unit of value defined in term of green dollars has theoretical shortcomings there are offsetting environmental benefits without considering the political problems raised above from using a basket of commodities.

Thirteen other features are used in Table 1 for ‘Comparison of fiat currencies with gold and renewable energy dollars’. No quality testing is required for fiat currencies, as quality is not defined as noted in row 2 of the Table. Tokens of fiat money have negligible intrinsic value while gold can be used in industry to some degree as suggested in row 3. Another special feature of renewable energy dollars is that they have an intrinsic use value to pay for electricity that is little shared by gold and not at all with fiat money as indicated in row 4.

As noted in row 5, governments determine the nature of fiat money. Sources of gold are concentrated in a handful of regions to create inequities between countries as noted in row 6. While commercially exploitable benign renewable energy is site specific it is very much

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more equitably distributed. Some sort of renewable electricity is available some of the time everywhere from the sun, wind and bacteria<sup>20</sup>.

Table 1: Comparison of fiat currencies with those based on gold and renewable energy

No	Comparison criteria	Fiat dollars	Gold dollars	Renewable Energy
1	Unit of value	Not defined	Ounces/grams	Kilowatt-hours
2	Quality testing	Not required	Density	Not required
3	Intrinsic value	Negligible	Say 10%	100%
4	Subjective value	100%	Say 90%	Nil
5	Source of currency	Government decree	Few locations	Many & technology
6	Equity of supply	Depends on Gov.	Concentrated	Widely spread
7	Cost of distributing reserve currency	Negligible with electronic transfers	Changes little with distance	Increases with distance
8	Changes in production of money	Controls & interest rates	Little related to consumption /GDP	Usually related to living standards
9	Volume of money controlled:	Indirectly by interest rates	Geography, trade and government	According to economic activity
10	Rate of change in production of money	Fiscal and monetary policies	Fluctuates with region and time	Relatively stable by region and in time
11	Cost of storage	Not required	1% of value p.a.	Not required
12	Cost of insurance	Not required	1% of value p.a.	Not required
13	Ecological features	None	Natural product	Limited life

The relative cost of converting renewable energy to electric power could vary according to the location. However, as noted in row 7 around 10% of electrical energy is typically lost in transmission, mostly when distributed at low voltage. A kWh currency would create a global standard unit of account but one that could vary in value relative to other commodities at different locations depending upon its source and the technology involved. As a result, market forces would allocate energy intensive industries to those locations with a comparative advantage in producing renewable electricity most efficiently. The financial and energy cost of distributing energy intensive goods and services would offset the advantage to some degree.

As noted in closely related rows 8, 9 and 10 the volume of national currencies made available is typically controlled indirectly by interest rates, fiscal policies and prudential ratios required by government and/or the BIS. The availability of gold to back a currency in an economy can vary from place to place as noted in the Table. The amount of power available to back a currency on the other hand is closely related to consumer demand. In this way the volume of kWh money automatically becomes closely related to the level of economic activity or GDP. However, not shown in the Table, the volume of gold and energy currencies could also be controlled by political interventions.

<sup>20</sup> Bacteria can produce electricity directly (Sliwa, 2006) or indirectly by releasing hydrogen from water (NCSU 2008) that can be burnt to power generators.

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The use of a physical commodity like gold as the unit of account or “reserve” currency introduces storage and insurance costs as noted in rows 11 and 12. These costs are avoided with fiat money, renewable energy dollars and derivative energy dollars that would need also to be created to introduce hand-to-hand money. This does not mean that some storage devices are not required for some forms of renewable electricity production.

The production of both gold and renewable electricity depends to some degree on the environmental endowment of a region while fiat currencies are not connected to nature in any way as indicated in row 13. Indeed, the ability of modern money to increase its value from earning interest over time without reflecting any increases in real resources is inconsistent with natural processes that result in all living things being subject to decay. The term “ecological money” has been used to describe a unit of account that has limited life but can be redeemed into a physically measured goods or service (Turnbull 1992). Examples of ecological money are the “bracteates” referred to in Section one and Free-Money redeemable into kWh.

The nature of a currency determines how resources are priced and markets allocate resources according to prices. To sustain humanity on the planet it is the environment that should influence how resources are allocated and governed as outlined by Turnbull (1992: 81–110). In other words society needs to become composed of environmental republics with feedback mechanisms to influence human activities to sustain both. This cannot occur with fiat currencies controlled by governments and their monetary policies and institutions that are neither flexible nor adaptive to provide resiliency or ecological feedback (Olsson, Folke and Berkes 2004: 75).

The importance of having a decentralized local currency to allocate resources was highlighted by Jacobs (1985: 161) who stated that “Because currency feedback information is so potent, and because so often the information is not what governments want to hear, nations go to extravagant lengths to try and block off or resist the information”. Jacobs (1985: 163) went on to explain:

Individual city currencies indeed serve as an elegant feedback controls because they trigger specifically appropriate corrections to specific responding mechanisms. This is a built-in design advantage that many cities of the past had but which almost none have now. Singapore and Hong Kong, which are oddities today, have their own currencies and so they possess this built-in advantage.

Consider a “mind experiment” that assumes that the consumption of foreign exchange in a region is directly proportional to the population of the region. Let us make two other reasonably realistic assumptions for a country like Australia where: 1. Ten percent of the population live in Western Australia, thus requiring only 10% of Australian foreign exchange and 2. Western Australians earn around 60% of all Australian foreign exchange through the export of their minerals and primary products. This means that on average each Western Australian is earning six times the foreign exchange they are spending.

Now if Western Australia established its own currency then its value would be determined by its terms of trade with the rest of the World. The other 90% of Australians residing in the Eastern States are earning only 44% (90%/40%) of the foreign exchange that they require.

The result would be a substantial decline in the value of the Australian dollar used in the Eastern States to create a boom in inbound tourism, education exports and manufacturing while the stronger Western Australia currency would attract migrants from the Eastern States and create an even greater strain on their resources. Other larger exporters in the Eastern

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States, mainly coal miners and farmers would demand that they establish their own non-urban regional currency to allow them to survive.

The mind experiment illustrates just how potent the design of a currency system can be. Currencies can create market forces far more influential than tariffs and taxes in allocating resources. It illustrates why tensions can build up in the European Currency Union. This raises the question as to what extent complementary currencies could mitigate these tensions. Is the rationale for a currency Union still valid if cost-carrying money became a general means of exchange?

*The Economist* (1991, noted the problem of misallocation of resources introduced by fiat money in the Soviet economy. To analyse the price distortions *The Economist* used kWh as a reference unit of value. *The Economist* has also established a “Big Mac index<sup>21</sup>” based on the relative prices of Hamburgers in different countries for comparing currencies.

To quote Onken (2000):

Gesell called for the establishment of an International Valuta Association, which would issue and manage a neutral international monetary unit freely convertible into the national currency units of the member states operating in such a way that equitable international economic relation could be established on the basis of global free trade.

Equity in the availability of renewable energy was the criteria in row six of Table 1 to accept kWh as a global unit of account. However, its value at different regions could vary to recognise how human occupation creates different physical impact in the different regions. Equity also requires the use of cost-carrying money so a bias is not created for people to prefer to hold paper assets rather than real assets. Cost carrying money also removes the inefficiency and inequity introduced into the financial system by Seigniorage.

The considerations raised in this Section provide arguments for reforming the financial system so that it reverts back to the decentralised creation of money. Digital technology provides a way for minimising transaction costs and removing the need for Central Banks as considered by King (1999: 48) and Turnbull (2010). King raised the question:

“Is it possible that advances in technology will mean that the arbitrary assumptions necessary to introduce money into rigorous theoretical models will become redundant, and that the world may come to resemble a pure exchange economy?”

A supporting argument raised earlier is that decentralisation provides resiliency and improves the allocation of resources in a manner more consistent with the host bioregion.

Feedback information from the local environment can be obtained by using products produced in the region to define a local unit of value. The use of kWh of electricity generated from local benign renewable resources need not be an exclusive unit of account. Locally produced products for export might also be used to establish favourable terms of trade as discussed in Morehouse (1989: 149–77).

The above observations offer lessons for reforming the architecture of the current financial system. These and other lessons arising from the 2008 crisis in the financial system are considered in the next and final Section.

## 5. Lessons from the 2008 financial crisis

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<sup>21</sup> Refer to <http://www.economist.com/markets/bigmac/index.cfm>

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There are many lessons that can be drawn from the global financial crisis in 2008. While the crisis was initiated by toxic sub-prime mortgages the spread and development of problems can be traced to fundamental inter-related structural deficiencies in the financial system. Over arching the many structural changes was the failure of institutions and their regulators to manage risk. The management of risk is a core role of financial institutions and their failure to do so means that the current system of US/UK corporate governance is fundamental cause of the 2008 crisis (Pirson & Turnbull 2011).

Some of the structural deficiencies arose because: (i) Regulators allowed financial institutions to grow so big that they could not be allowed to fail; (ii) Financial institutions increased their risk exposure by Regulators allowing them to diversify their business operations into multiple activities; (iii) Regulators allowed financial institutions to create and trade instruments which “defied understanding” (Ramsey 2008) and (iv) Governments allowed “shadow” banks to create credit and contractual liabilities to finance the formation of synthetic assets whose values rose to many times the GDP of the global economy and whose volatility became unmanageable.

A fundamental requirement for a market economy to obtain self-regulating features is that firms are allowed to fail. However, executive remuneration increases with size as does the power, status and influence of its managers and directors. This creates compelling incentives for firms and their lobbyists to argue that size generates economies of scale to obtain international competitive advantages for the firm and so also for their host economy. The result is that firms get too big and too complex for CEO’s and especially their directors to know what is going on as detailed by Turnbull (20008b).

The natural science of Governance identifies why it is impossible for centrally controlled firms to manage complexity on a reliable basis (Turnbull 2002). Likewise the science of governance identifies why Regulators cannot directly monitor or control the complexity of the financial system without effective co-regulators (Turnbull 2008d). One secondary lesson of the 2008 financial crisis is that Auditors and Rating firms who are paid by the entities that they judge cannot be relied upon as effective co-regulators. Even if Auditors and Rating firms did not have an unconscionable unethical conflict of interest they would still be exposed to the problem of judging the operations of entities too large for their CEO to know what was going on.

Government regulators and policy advisors are typically trained in law, economics or accounting. Education and qualifications in these professions are typically not dependent upon knowledge of the science of governance (Turnbull 2002). Another problem is that economists typically focus on efficiency rather than resiliency that are concerns of natural scientists (Olsson, Folke and Berkes, 2004). Lietaer, Ulanowicz, and Goerner (2008) show how there is a trade-off between efficiency and resilience. While economists express concern and formulate policies about firms exerting market dominance the test of resiliency for the firm and its industry may be neglected.

The Internet was designed by natural scientists to withstand nuclear war. Resilience was achieved by avoiding centralised control and dependency by using network governance to introduce a rich redundancy of operating modes. Big is neither beautiful nor best if resiliency is required to cope with excessive shocks to a system. Social scientists need to learn that small is beautiful. Humans exist today because our ancestors’ survived the catastrophic shocks to the global bio-system that killed off the dinosaurs.

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Precedents exist in the US for breaking up large firms in the Oil and Telecommunication industries that could be applied to the finance sector. One way for forcing banks to develop a network business model would be for the regulator to require Banks to provide a security deposit with the government of all deposits that were in excess say of one percent of all the deposits in the system. The interest paid by the government on the deposits could decrease over time to reduce the profitability of banks that were large enough to be required to provide a deposit. After an adjustment period when no bank in the system was required to put up any security deposit there would be no bank in the system too big to fail.

The tax system in leading industrial countries creates a strong incentive for firms to over borrow because interest is typically a tax deduction but equity distributions are not. A much more resilient and efficient financial system would be created if equity distributions became a tax deduction like interest. This would make the tax system neutral in regards to firms being financed by debt or equity. In many jurisdictions it would also make the tax system neutral as to the legal form adopted (Turnbull 1979).

Partnerships, cooperatives and trusts do not become taxable in many jurisdictions if the operating surplus is fully distributed. Double taxation of profits is avoided with this arrangement. If corporations were taxed in a similar manner it would increase the efficiency of the financial markets as firms would become dependent upon re-investment of dividends by their equity holders and/or new share issues. The re-investment decision is transferred from managers to investors who have much greater choice and little self-interest to reward questionable performance by re-investment of their dividends. Making managers more accountable to their owners would also increase efficiency. Corporate disclosure and governance could be expected to improve. The rate at which firms could grow would be attenuated to slow down the processes of firms becoming too big to fail.

Another structural problem of the current system is that banks have diversified into different activities. A basic role of a bank is to convert call deposits into long-term loans. Because this intermediation role is inherently risky governments have provided through their central banks a lender of last resort facility. It is unfair to other businesses to allow banks to retain this privilege and enter into business activities where the government does not formally provide a lender of last resort facility.

Besides being exposed to the liquidity risk of borrowing short and lending long, banks are also exposed to the risk of value loss on their loans. This raises the question as to what extent banks should accept this additional risk without some form of risk insurance. It was the slicing and dicing of sub-prime mortgage risks that infected the financial system. Specialised mortgage insurance institutions outside of the banking sector provide an alternative approach for consideration.

One lesson is that risk insurance on loans should be obtained only from the non-bank sector. Another lesson is that the laying-off of risk needs to be achieved on a completely transparent and fully informed basis, by those who possess the knowledge to creditable and independently evaluate the risk. Ideally, underwriters of loss risk should have the knowledge, incentive and means to directly participate in preventing losses and/or working out problem loans. Regulators need to use this sort of criteria for allowing banks to lay-off their lending risks.

Foreign exchange risk has created a number of bank failures rather than liquidity and loan loss risk. It would seem desirable that this risk is also quarantined from the financial intermediaries exposed to the risk of borrowing short and lending long. Likewise there seems

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to be no reason why banks as managers of liquidity risks should also be allowed to accept underwriting and investment risks.

Another fundamental structural problem is that financial institutions are allowed to create and sell financial instruments whose complexity was beyond the understanding of Regulators. The most senior financial official of the Australian Government admitted the fact that Regulators have lost their way. The Treasury Secretary, Dr. Ken Henry stated:

The array of financial instruments deployed within the global financial system has become so complex that it defies understanding. For decades to come, policy makers around the world are going to be asking why those with sufficient authority didn't, at some point, stand above the buzz of the financial markets and declare, in simple language, that all of this simply doesn't make sense. (Ramsey 2008).

The need to avoid complexity was a design criterion of Bob Swann the President of the E.F. Schumacher Society who had earlier worked with Ralph Borsodi in 1973 to set up a commodity-backed currency in New Hampshire (Morehouse 1989: 178–83). His criteria were: (i) be simple to understand; (ii) use redeemable currency; (iii) establish a stable universal unit of account and (iv) organize and control at a local level. Another authority on complementary currencies, Bernard Lietaer (2001) proposed three other design criteria. The currency would: (i) Allow a country or region to unilaterally establish an internationally recognised convertible currency; (ii) Promote economic activity without inflation, and (iii) Support ecologically sound development. Establishing cost-carrying money redeemable into renewable energy dollars can meet all the aforementioned seven criteria in most localities. This is not to deny the use of other commodities.

If other commodities are used then ideally they should be locally produced, as was the case for many local cost-carrying currencies established in Europe during the 1920's and 1930's. In this way local economies could establish locally controlled banking arrangements to de-link their communities from failures in the external monetary system and/or the misallocation of local resources (Turnbull 1989: 159–77). The rapid spread of cost-carrying money in Europe and the US during the great depression provides evidence of its simplicity, replication, and attraction.

Suhr, like Fisher lists a number of theoretical objections to cost-carrying money, but then goes on to state “we can confidently leave most of them to the practitioners who, once they have understood the system, can bring neutral money to life better than monetary theory can” (Suhr 1989: 121). Others have argued against the possibility of Free-Banking arising from the introduction of e-money. Akyazi and Artan, (2006) show how e-money reduces the power of central banks to control monetary policy but argue that central banks will learn to adapt to protect their turf. But their argument is based on interest bearing money and they note that a number of economists<sup>22</sup> suggest, “that central banking can go bankrupt and even more vanish”.

A strategy for creating the incentive and facility for private innovation and to also overcome resistance of the keepers of the orthodoxy would be for governments to adopt their own versions of the Bankhead-Pettingill Bill explained in the Appendix of Fisher (1933). The introduction of a paper based cost-carrying money, as legal tender would quickly attract innovators to produce digital based cost-carrying money for the government. Inevitably they

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<sup>22</sup> King (1999), Dowd (1998), Rahn (2000), Freidman (1999, 2000), White (2001), and Cronin and Dowd (2001).

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would then seek approval to issue their own cost-carrying money to earn Seigniorage and/or to finance new productive activities and government infrastructure.

As indicated in the discussion above, the introduction of cost-carrying money would introduce profound changes in the operations of market economies and financial institutions that are too numerous to list in this discussion. Real interest rates could be expected to approach zero with a reduction in the discount rate applied to evaluating the attraction of procreative assets that generate economic growth without increasing working hours. Resources would be allocated to generating economic growth rather than to speculation. The opportunity for investors to earn un-earned income would be reduced to minimise income and wealth inequality (Palley 2007).

Gesell (1916) was also concerned with un-earned income arising from uplift in the value of urban property ownership. Complementary proposals to those of Gesell for reducing un-earned income arising from the ownership of realty and corporations have been proposed by Turnbull (1992). Like cost-carrying money in its “ecological” form, the proposals are based on introducing ecological rules for owning realty and corporations. The adoption of ecological rules for owning money, realty and corporations would introduce a new type of market economy described as “Ecological Capitalism” (Turnbull 2008a,c, Turnbull 2011).

A community based decentralised free banking regime based on ecological currencies might then soon develop as described in Turnbull (2008a, forthcoming). In this way Gesell’s objective of reducing unearned income could be achieved while establishing a more efficient, equitable and sustainable economy with a cost effective resilient financial system.

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