

How should regulators control cell phone money?

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ABSTRACT

This paper considers how should regulators control cell phone money? E-money transacted through cell phones has achieved rapid growth. Technology has allowed various units of value to emerge as a medium of exchange to compete with legal tender without involving banks. This practice could accelerate from financial system uncertainty and/or another crisis. Cell phone money makes practical the re-introduction of cost carrying money supported by Fisher, Keynes and Buiter. Four options are considered for regulators to accept cost carrying money as: (1) a government issue redeemable into legal tender as proposed by the US Bankhead-Pettengill Bill of 1933; (2) private issues redeemable into official money as occurred during the Great Depression; (3) private issues convertible into specified commodities as occurred in Europe in the 1920's; and (4) a regional government regulated unit of value defined by the retail value of electricity generated from benign renewable resources of the region. Arguments for regulators to accommodate the emergence of regional sustainable energy dollars are: (i) reduce the need for carbon taxing and/or trading; (ii) establish a stable unit of value; (iii) improve monetary efficiency and equity; (iv) protect local financial systems from contagion and improve their resilience; (v) create market forces to distribute the global population according to the carrying capacity of each region (vi) reduce market failure in allocating sustainable resources; (vii) reduce the cost of the financial system; (viii) allow currencies to be democratically controlled by mutually owned regional organisations rather than by alien for-profit technology firms.

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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 considers how should regulators control electronic cell phone money. E-money transacted by cell phones has achieved rapid growth in developing countries that possess few landlines and fewer banks. Ten percent of the world’s population own cell phones in Africa. East Africa has 80 per percent of the world’s cell phone money transactions (Smith & Shapshak 2012). Notes and coins might well be replaced in the foreseeable future by cell phones that become electronic purses to act like debit cards (Turnbull 2010a, *The Economist* 2012a).

A number of scholars have considered the development of e-money and its impact on Central Banking (Akyazi & Artan 2006, Cronin & Dowd 2001, Dowd 1998, Friedman 1999: 28, 2000, Gormez & Budd 2003, Goodhart 2000, King 1999, 2010, Rahn 2000, European Central Bank 2012). As noted by King (1999:48) “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”. This has now been achieved with cell phone money.

Since 2008, the central Banks of the Philippines¹ and Bahrain² have approved both domestic and international transfers between cell phone owners. The transactions can now occur without transfer agents or a bank. It also illustrates the point made by Gormez & 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”.

King (1999: 47) considered the future nature of banking before he became the Governor of the Bank of England. He raised the question: “Will future historians look back on central banks as a phenomenon largely of the twentieth century?”

Cell phone operators have plans for spreading their technology globally. A Bank of England research paper concluded that electronic barter would not remove the need for e-money (Capie, Tsomocos, & Wood 2003). In 2012 the Royal Canadian Mint ran a competition for how e-money could be used and another competition for developers to create e-money cell phone applications³.

Cell phone money has allowed privately determined units of value to emerge as a medium of exchange to compete with official legal tender. The convenience of cell phone money and uncertainty over the stability of the financial system is encouraging the development of alternative mediums of exchange. This highlights the need for policy makers and regulators to consider which informal forms of money might be acceptable, promoted and/or adopted as a complementary currency?

Another reason for regulators to consider acceptance of alternative types of money arises from uncertainty associated with official types of money. The Secretary General of the Basle Committee on banking supervision stated “it will be impossible to avoid a repeat of the failures that caused a near collapse of the financial system in 2008” (Drummond 2011). Since the 2008 crisis, the financial system has increased the risk of failure according to Haldane,

¹ <http://www.mhitslimited.com/mobile-remittance-to-philippines>

² <http://wirelessfederation.com/news/zain-bahrain-launches-zain-wallet-bahrain/>

³ <http://mintchipchallenge.com/>

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the executive director for financial stability of the Bank of England. Haldane (2011) has identified a “doom loop” created by banks creating credit to lend to each other. In this way banks have become more tightly interconnected so the failure of one could lead to the failure of many.

Bezemer (2009) proved false the many claims that no one saw the 2008 crisis coming. This claim cannot be used again if another crisis eventuates. However, a new question might be raised like: why did not governments and/or their regulators create and/or allow failsafe “financial lifeboats” to be created? (Turnbull 2011). To avoid this question being raised it should become a matter of urgency for regulators to encourage trials of alternative ways of establishing widely accepted units of value that are not dependent upon official legal tender. There is at present no official fiat money anywhere in the world that creates a definable connection to any one or more goods and services.

However, notwithstanding that modern money is no longer definable in terms of any real goods and/or services, monetary values and so prices and costs create the numéraire for market forces to allocate real goods and services. This raises the need for a supplementary and/or alternative money system to create a numéraire that provides some meaningful connection to real goods and services. The ability of an informal currency to provide such connection provides criteria that regulators could use in allowing new types of money to emerge. Ideally, the connection would be based on goods and/or services used in maintaining a modern society. Arguments raised in 1991 for “tethering” money before the Euro was introduced are just as valid as they were then (*The Economist*, 1990a, b).

As to the form of an alternative currency, Buiter (2009) has suggested that negative interest rate money would be useful to stimulate an economy when nominal interest rates have become negligible. Fisher (1933) and Keynes (1936) supported the private issue of cost carrying money described as “Stamp Scrip” during the Great Depression because of its success in stimulating economic activities. Either private issues or an official issue of a complementary cost carrying currency provides a way to stimulate economic activity without increasing government debt or taxes. This provides another criteria for regulators to approve if not facilitate or even introduce a complementary currency.

Cell phone now makes it practical for Stamp Scrip, also described as “cost carrying”, “negative interest rate” or “demurrage” money to emerge again (Turnbull 2010a). Gesell (1916) developed the idea of a paper demurrage currency. He was inspired by Proudhon (1840) who was concerned about money owners acquiring income without the owner, or the money, making a contribution to the welfare of society. Like his former friend and contemporary Karl Marx, Proudhon wanted to eliminate “unearned income”.

Followers of Gesell introduced demurrage money in Germany during the 1920’s (Fisher 1933). Suhr (1989) described Stamp Scrip as “neutral” money because it could remove the bias to invest in financial assets rather than real assets. This provides an important advantage as recognised by Keynes (1936). However, the term neutral money is inappropriate as some forms of demurrage money reversed the bias as discussed below. One important advantage of demurrage money is that it could provide a way for Central Bankers to avoid the “zero bound” of monetary policy (Buiter 2009). For the above reasons and others discussed later this paper limits its analysis to regulators only accepting a demurrage form of e-money.

Four options are considered: (1) a government issue redeemable into official money as proposed by the US Bankhead-Pettengill Bill of 1933; (2) private issues redeemable into official money as occurred during the Great Depression; (3) private issues convertible into specified commodities as occurred in Europe in the 1920’s; and (4) a regional government

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regulated unit of value anchored to, but not necessarily convertible into the retail value of electricity generated from benign renewable resources of the region⁴. Sustainable Energy Dollars (SEDs) established on this basis will be referred to as \$Z (Turnbull 2012a).

The following section reviews development of alternative mediums of exchange and related issues over the last century. A longer view of changes in the financial system is considered in section three. Section four considers historical experiences with various forms of demurrage money. A comparison is made in section five between fiat money, gold and \$Z. Some concluding remarks and recommendations in regards to the four types of demurrage currencies considered are presented in section six.

2. Heterodox mediums of exchange

This section provides some background information of alternative mediums of exchanges that have emerged over the last century with some related issues.

Today there are around 5,000 mutual credit systems operating around the world according to the Complementary Currency Resource Centre (CCRC 2012). Some are based on bartering time to create “Time Banks” (Cahn & Rowe 1992). Others are described as “Local Exchange Trading Systems” or LETs (Nishibe 2001). LETs may also use labour time or local fiat money as their unit of value.

There are many regional complementary money systems operating in the US, UK and other places around the world. A common feature is that their unit of value is defined by official money. This allows local currencies systems to become publicly accessible. The oldest and biggest complementary currency is the Swiss WIR system established in 1934. While its value is defined by official Swiss money it is not convertible and so it is not available to the public. However, today around 70,000 Swiss businesses have met its credit check requirements to become members (Greco 1994). In Brazil there are 200 cities that have their own social currencies that are accepted by the Central Bank (Freire 2011, 2012).

Demurrage currencies are currently only found in Germany (Real Currency 2012). It was in Germany that demurrage currency was pioneered in the 1920’s (Fisher 1933). Their current renaissance has been encouraged by the work of Margrit Kennedy (1988). As all these regional currencies are tied to the Euro they are all publicly accessible. But this also makes them subject to failure if the Euro fails. Likewise the Swiss WIR system would fail if the Swiss banking system failed. The same problem exists for other non-demurrage currencies circulating in the UK like the Brixton⁵ or Bristol⁶ pounds.

This highlights a fundamental problem of most complementary currencies systems. To meaningfully support and complement official money and act as a “financial lifeboat”, alternative currencies need to establish an objective unit of value that is independent of official money. There will be a need for a widely accepted unit of value to anchor or “tether” (*The Economist* 1990b) complementary mediums of exchange. This provides criteria for regulators to allow experimentation to test the acceptance of alternative units of account.

Fisher (1933) and Keynes (1936) supported Stamp 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 states that Gesell had described: “the

⁴ Turnbull (1977, 1989: 177) initially proposed that energy dollars be redeemable. This idea was replaced as it would introduce the liquidity risk of fractional banking provide sufficient money to finance activities.

⁵ <http://brixtonpound.org/what/>

⁶ <http://bristolpound.org/>

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establishment of an anti-Marxian socialism” based on “an unfettering of competition instead of its abolition⁷” Onken (2000) described Gesell’s ideas as “A Market Economy without Capitalism”. Demurrage money could supplement existing forms of money and/or provide a decentralised fallback currency in the event of another crisis in centralised monetary regimes.

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 into 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 described demurrage money as “Free Money” because it was interest free. In Chapter 11 Gesell (1916) states:

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 Stamp Scrip 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.

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 demurrage money again has relevance as a way of “reinflating” an economy described by Fisher (1933: 61) and Buiter (2009).

Fisher (1933: 68) noted that Stamp 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, Stamp Scrip could provide an influential monetary tool for governments to augment the

⁷ Keynes (1936) stated: “I believe that the future will learn more from the spirit of Gesell than from that of Marx”

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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 1934 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.

Demurrage 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, Stamp Scrip spontaneously and rapidly 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 Stamp Scrip in the US and Europe.

The rapid spread and varieties of Stamp 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 regulators allow competing currencies as proposed by Hayek (1976a) to control inflation? Might a better option be to anchor the value of money to specified goods and/or services? Should regulators require money be convertible into specified goods and/or services or just anchored to their value? Should a global currency be encouraged, and if not how should currency regions be determined (Mundel 1961, Jacobs 1985, Turnbull 2012b)?

To consider these questions a long view of the financial system is next considered.

3. Changes in the structure of money and banking

The nature of money and banking has undergone radical changes since its early evolution thousands of years ago.

Demurrage 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 of 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 quality and quantity 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

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Stamp Scrip (Suhr 1989: 111). Until the last century, money was defined in terms of a commodity. Warehouse receipts for commodities 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 17th to 19th 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 20th 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 argued by (Smith 2009, Solomon 1996).

Centralized banking became established in 18th 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 Kings army. In this way the practice was established for a privately owned bank to make profits described as “Seigniorage⁸” from creating credit 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 on the deposits created from making loans. 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 fact that private banks create around 97 per cent of the money supply in the form of deposits comes as a surprise to members of the public. They find it difficult to understand how governments have allowed themselves to be captured by banking interests. It is inconceivable to many that the financial system is back to front with banks creating money that their customers lend to the government instead of the government creating money to lend to the banks.

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 Corporation⁹ as a privately owned entity (Griffin 2002, Schauf 1998).

⁸ In this paper the word “Seigniorage” will be use to describe the net revenue derived from the issue of coins, currency notes as well the “special profits” (Huber & Robertson 2000) accruing to banks by their ability to create credit.

⁹ 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 1998).

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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 profits from creating legal tender that their customers then lent 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 right of the US government to determine who can create money is 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* (1990a) described fiat money as “funny money” in discussing the introduction of the Euro. It questioned if commodities should back the Euro? Without the need to store and/or insure gold, silver or any other commodity as a “hard” or reserve currency, the carrying cost of holding money 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 create money and bank deposits; (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) Interest earning money has created a bias 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 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 & Robertson (2000). In addition, governments then borrow money to contribute to the seigniorage earned by the private sector that concerned Patman.

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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 deposit money has been estimated by Huber & 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, Benes & Kumhof 2012). 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.

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 economies become if the private banks did not possess the privilege of making profits from creating non-cash deposit 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 producing, consuming, trading and investing as occurred before fractional banking spread in the 17th century and facilitated by the emergence of central banks providing lender of last resort facilities.

Friedman & Friedman (1985) proposed an amendment to the US constitution to allow the executive government to create credit as this was supposed¹⁰ 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 & Schwartz (1971: 566), Griffin (2002: 573), Huber & Robertson (2000: 9), Marx & 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”¹¹. The Act represents what this author

¹⁰ 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.

¹¹ 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

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describes as “selective” monetary policy as it provides credit without an interest cost for nominated purposes. Selective money policy¹² provides one way to eliminate the finance cost of investments that Moulton (1935) describes as being “procreative property¹³”. In particular, selective monetary policy could be used to provide interest free finance for generating renewable energy. As shown in Turnbull (2010b) this would reduce or even eliminate the need for carbon taxing or trading by reducing the cost of producing electricity from renewable energy.

A number of leading authorities like King (2010: 170), IMF analysts (Benes & Kumhof 2012) and grass roots activists like “Positive Money”¹⁴, have proposed removing the power of banks to create non-cash money in the form of deposits by making loans. 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 Basle based Bank for International Settlements (BIS).

The termination of fractional banking as discussed by Fisher (1934), Friedman (1960), Tobin (1987), Kay (2009), King (2010) and Benes & Kumhof (2012) 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 & Friedman (1985) describe as “non-interest bearing non redeemable obligations”. Another option would be for credit to be created in the private sector by producers, merchants, consumers and investors (Turnbull 2009, 2012a).

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 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, the government could supply it. The government could then use the profit or seigniorage created to reduce the need to raise tax revenues as calculated by Huber & 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 seigniorage from the real economy and so the cost of “financialization”.

In recent years, the credit created by commercial banks has been overshadowed by the credits created by investment banks to finance derivatives. The ability of such “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

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).

¹² 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.

¹³ Moulton (1935: 10–11) defines “procreative property” as “the processes by which society expands its power to make nature yield its resources more abundantly”.

¹⁴ <http://www.positivemoney.org.uk/>.

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11 times global GDP in 2007. The asset bubble created by synthetic assets has been matched by *real* liabilities that reduce 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.

4. Experiences with demurrage money

As noted above, the idea of introducing a usage charge for paper money was developed by Silvio Gesell. Gesell was 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* (Gesell 1916).

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 “Stamp 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 per cent each week was used in some communities. This allowed the issuer to raise revenues of 104 per cent of the face value of the note over a year to make the money self-financing and so self-liquidating. It also 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.

A precedent for giving away money is referred to by Galbraith (1975: 53) who records how the US State of Maryland in the 18th 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 per cent cost per week, the cost becomes less costly than credit card charges that typically cost more than 2 per cent per transaction. Stamp 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

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“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 Stamp 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 Stamp 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 demurrage currency by the government would have diminished the relevance of the Central Bank and given encouragement to those seeking to repeal the Federal Reserve Act. The Bankhead-Pettengill Bill of February 17, 1933 would have been of critical concern to the private and very influential shareholders¹⁵ 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 4th 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 stamp scrip. Keynes (1936: 234) supported the use of stamp 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 stamp 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 demurrage 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

¹⁵ 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).

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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 of regulators may be required for monetary experiments¹⁶. The E.F. Schumacher Society based in Great Barrington Massachusetts established a precedent for regulators to sanction monetary experimentation in 1982. Its President, John McClaughry was also a senior policy advisor to President Reagan. McClaughry obtained permission from both the US Comptroller of currency and the Secret Service for the Society to introduce local currencies¹⁷. This led to the introduction of Deli Dollars, Ithaca Hours¹⁸ and Berkshares¹⁹. Hopefully regulatory permission to establish larger experiments with heterodox monetary systems will not need to wait until there is breakdown of the existing system?

Not withstanding current regulations, local mutual credit and complementary currencies are spreading rapidly around the globe. Except for the issue of “Liberty Dollars” in the US it is difficult to determine from the database of the Complementary Currencies Resource Centre how many have adopted an objective unit of value²⁰. Many privately sponsored e-money initiatives may have independent units of value. However, they may not provide an objective unit of value as it could be at the direct or indirect discretion of their promoters²¹.

Bernard von Nothaus privately established Liberty dollars in 1998. He described himself as “Monetary Architect”. Before the Liberty Dollar home page²² 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 crimes²³ and were imprisoned in 2010²⁴.

¹⁶ The legal situation in the US is described by Solomon (1996: 95–127).

¹⁷ These initiatives 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 lecture notes of the seminar presenters were published in Morehouse (1997).

¹⁸ <http://www.ithacahours.org/directory.php>.

¹⁹ www.berkshares.org.

²⁰ Refer to <http://www.complementarycurrency.org/ccDatabase/maps/worldmap.php>.

²¹ One example is the “Ven” promoted by the Hub Culture described at: <http://www.venmoney.net/>.

²² Refer to <http://www.libertydollar.org/>.

²³ http://en.wikipedia.org/wiki/Liberty_Dollar.

²⁴ <http://tekgnosis.typepad.com/tekgnosis/2010/08/bernard-von-nothaus-of-liberty-dollar-fame-is-jailed.html>.

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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.

5. Choice in currency?

This Section compares contemporary fiat money with a gold backed currency and a currency that is backed by market contracts for goods and/or services that are valued by reference to the retail value of electricity generated from local benign²⁵ renewable sources (\$Z). For the purpose of making a comparison it is assumed that \$Z are created by producers, consumers, traders and investors creating credit that is guaranteed by a mutually owned and democratically controlled community insurance agency (Turnbull 2012a). The users of the money so created contribute to the cost of the insurance fee to create a demurrage currency. In this way each community could establish a standard demurrage cost for its currency within its currency region.

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 (Fisher 1911). Keynes (1980: 121) suggested settling international trade imbalances with a unit of account he called “Bancor”. Its value would be determined with reference to a basket of commodities based on their global consumptions. 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). Former Belgium Central Banker, Lietaer (2001) has suggested an updated version of the Bancor described as the “Terra”. Pope (2012) has also proposed a global currency.

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.

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. \$Z creates a unit of value 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).

²⁵ 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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Advanced economies are highly dependent on the consumption of energy. Energy consumption closely correlates with total economic activity in most countries (Gogerty and Zitoli 2012). 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. The availability of renewable energy is limited only by the investment to produce it with the incentive to invest determined by demand.

Wind powered electrical generators may be available on average for only 30 per cent of every 24 hours while solar generators may only obtain power for 20 per cent 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 or four 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 2010b). 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 used demurrage money.

So while a unit of value defined in terms of \$Z has theoretical shortcomings there are offsetting environmental benefits.

Thirteen other features are used in Table 1 for 'Comparison of fiat currencies with gold or renewable energy'. 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 more equitably distributed. Some sort of renewable electricity is available some of the time everywhere from the sun, wind and bacteria²⁶.

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 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 Table 1. 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

²⁶ 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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kWh money automatically becomes closely related to the level of economic activity or GDP as shown by (Gogerty & Zitoli 2012).

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 but not with \$Z.

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

No	Comparison criteria	Fiat dollars	Gold dollars	Renewable Energy (\$Z)
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.	Depends
12	Cost of insurance	Not required	1% of value p.a.	Credit worthiness
13	Ecological features	None	Natural product	Limited life

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 with all living things being subject to decay. Compounding interest also creates the problem of needing to more money to pay the interest whether or not incomes are increasing in the economy.

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

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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 & 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.

Inappropriate currency regions can create distortions in the efficient allocation of resources far greater than that might be introduced by commonly accepted levels of taxes or tariffs. To illustrate this point let us assume that the amount of foreign exchange (FX) required in any region of the world is directly proportional to its population. This would mean that a region like Western Australia (WA) where only 10% of Australians live would only need to earn 10 per cent of national FX earnings. However, each man, woman and child in WA earns on average six times the FX that they can spend. Conversely this means that the other 90 per cent of Australians only earn $30/90=23$ per cent of the FX that they require. If each region had possessed its own currency, then the Western dollar would be worth considerably more than the Eastern dollar.

The result would be that manufacturing; tourism and the export of educational services in the East would flourish while there would be an incentive for Eastern residents to migrate west. While the mineral and agricultural endowments of nature create the financial incentive for western migration, the ability of renewable WA resources to support a larger population might not necessarily also be available. In this way this example illustrates: 1. How powerfully monopoly currencies regions can distort relative values within a monetary union, and 2. How market forces can be created to distribute the population around the planet in a way that may not be sustainable.

The first point provides a compelling argument against regional and global monetary unions as proposed by some scholars even if there was a fiscal union. The current problems with the Euro illustrate the tension that a common currency area can create. The second point provides a compelling argument for prices, values and costs to be defined in terms of resources in each region that can support humanity in each bioregion on an environmentally sustainable basis. That is, to define a medium of exchange in terms of the retail value of electricity generated from benign local sustainable sources. Multi-regional or global units of account would deny using market forces to distribute the plague of people on the planet on the most environmentally sustainable basis.

The very fact that monetary unions cannot be sustained without fiscal transfers provides evidence that market allocation of resources by a monopoly currency cannot be efficient (Turnbull 2010b). However, introducing different types of money most appropriate for different social and/or bioregions could introduce costs and inconvenience from requiring more money-changes. But these sources of costs and inconveniences can now be minimised by currency exchanges carried out automatically with cell phone banking (*The Economist* 2012b: 19–25). It makes sense for regulators to allow local currencies to emerge if: (a) Their

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value is anchored to a local service of nature, and (b) Their use is also anchored to local bioregions with homogeneous characteristics.

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 index²⁷” 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.

Cell phone provides a way for minimising transaction costs and removing the need for Central Banks as considered by King (1999: 48) and Turnbull (2010a,b). 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?”

Table 2, Systemic differences between legal tender and sustainable money (\$Z)

	Difference between:	Existing money	Sustainable money (\$Z)
1	Interest rates:	Central Bank influence	Cost of risk insurance
2	Integrity of system	Exposed to contagion	Little exposed to contagion
3	Choice of currency	Government monopoly	Determined by communities
4	Inflation control by:	‘Blunt’ policy instruments	Value of renewable energy
5	Structure of money:	Unlimited accrual of interest	Carrying cost limiting life
6	Ecological feedback	None	Local renewable resources
7	Economic flaw-1	Incentive to own money	Disincentive to hold money
8	Economic flaw-2	Allocates resources to finance	Real assets more attractive
9	Economic flaw-3	Distorts price relativities	Sustainability determines price
10	Environmental flaw-1	Incentive to burn carbon	Favours renewable energy
11	Environmental flaw-2	No feedback from nature	Nature controls price signals
12	Social flaw-1	Compounds unearned income	Limits unearned income
13	Social flaw -2	Concentrates influence	Localizes influence
14	Political flaw-1	Concentrates power	Enriches local democracy
15	Political flaw-2	Low accountability	Cooperative accountability

²⁷ Refer to <http://www.economist.com/markets/bigmac/index.cfm>

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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. The considerations raised in this Section provide arguments for regulators to allow decentralised creation of money according to bioregional characteristics.

Feedback information from the local environment can be obtained by using products from the region to define a local unit of value. The use of \$Z need not be an exclusive unit of account. A case could be made for regulators to allow different types of currencies to exist and allow the invisible hand to select the most desirable. However, this might allow the perpetuation “The biggest market failure the World has ever seen” (Stern 2006). \$Z provides a way mitigate such market failure.

Table 2 describes systemic differences between legal tender and sustainable money (\$Z). It provides a summary of points raised in regards to \$Z. The role of other types of demurrage currencies is considered in the concluding section.

6. Concluding comments

In this section the possible roles of various types of demurrage money are considered. The alternative forms of demurrage money could become important if another global financial crisis emerges without adequate development of \$Z. \$Z requires appropriate institutional development of mutual credit insurance agencies. Other components are satisfactory reference points for the retail value of benign renewable energy. A common requirement for all forms of demurrage currencies would be a satisfactory cell phone application for transacting demurrage money for most types of cell phones.

The cell phone technology already exists ironically in many developing countries. In a number of jurisdictions, the relevant Central Bank and regulators are already involved. Leading software and cell phone corporations are in the best position to quickly transfer the technology and negotiate the regulatory protocols to introduce e-money of any type to advanced economies. If a crisis arose, regulators would then be forced to expedite their decision-making and so might be forced into compromises in protecting the public interest from exploitation by dominant technological corporations.

In such a situation the option of a government issue of a complementary demurrage e-money becomes an attractive option. Model legislation is set out in the four pages of the Appendix in Fisher (1933: 79-82). The one trillion dollar government issue of stamp script was to be distributed to each US State in proportion to their population. Half the issue was to be used by State governments to create jobs in building infrastructure facilities and the other half distributed as welfare payments to citizens. The stamps valued at two per cent of the face value of the scrip were to be sold by the US post office.

Today, central governments could distribute the e-money directly to cell phones to all citizens and/or to those that qualified for welfare. This would expedite stimulation of the economy from the bottom up rather the current approach of quantitative easing from the top down. Governments would not need to incur taxes or debt.

An emergency Government Issue of demurrage e-money has the advantages of setting a precedent and establishing the technology and processes for regulators to allow other types of demurrage currencies to be introduced. Suhr (1998: 121), like Fisher lists a number of theoretical objections to demurrage 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”.

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If national governments and their regulators are not ready to introduce an emergency supplementary currency then other levels of governments and private business associations are likely to step into the gap as they did during the Great Depression. The author established the Green Money Working Group (GMWG)²⁸ in the UK in October 2011 for this purpose. However, today giant technological firms now might also fill the gap. Regulators would need to decide on how to handle these opportunities to introduce economic stimulation to economies in distress from another financial crisis. Decision-making often occurs when decision-makers run out of options. So if it became politically expedient for regulators to accept solutions from dominating technological firms then a transition to a more politically acceptable architecture would need to also be established.

This paper provides a menu for various transitional arrangements. Such as community issues of demurrage e-money redeemable into official money or specific goods or services or defined in terms of a specified good or service like \$Z.

Short-term practical solutions that may not be politically or economically attractive could be accepted in an emergency if governments and their regulators could provide a vision for reforming the financial system. A number of unexplainable unsatisfactory features of the existing system are set out in Turnbull (2009). For the general public the problems can be summarized in one sentence: The financial system is back to front, inside out and upside down.

It is back to front because the private sector creates most of the money to lend to the government instead of the government creating money to lend to the banks. It is inside out because economic values are determined by an internal self-referential social construct described a legal tender that is not connected or definable in terms of the outside real world and its environment. It is upside down because money creation is top down from institutions that absorb wealth like the government and banks instead of being bottom up with money being created by those who create wealth like producers, consumers, traders and investors.

The introduction of \$Z would meet the demands of the occupy movement who seek a more democratic bottom-up control of finance and banking. As discussed above it would also: (i) reduce the need for carbon taxing and/or trading; (ii) establish a stable unit of value; (iii) improve monetary efficiency and equity; (iv) protect local financial systems from contagion and improve their resilience; (v) create market forces to distribute the global population according to the carrying capacity of each region (vi) reduce market failure in allocating sustainable resources; (vii) reduce the cost of the financial system; (viii) allow currencies to be democratically controlled by mutually owned regional organisations rather than by alien for profit technology firms.

In short another financial crisis could provide regulators a basis for presenting a vision and the means for introducing a more efficient, equitable and sustainable economic system that could lead to providing sustainable prosperity for all without growth (Turnbull 2013).

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²⁸ Introduced by "The Global Transition to a New Economy" at: <http://www.gtne.org/?q=node/337> with Green Money Working Group home page at: www.gmwg.org. Also at: <https://sites.google.com/site/smwgorg/>.

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