

Terminating Currency Options for Distressed Economies

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The research goal is to investigate how supplementary digital terminating currencies can provide a superior fallback position to Bitcoin in a financial crisis and/or provide a basis for rehabilitating distressed economies. Greece lost the opportunity to regain monetary sovereignty because its finance Minister believed that at least a year would be required to introduce new notes and coins. Digital self-liquidating Euros could be distributed immediately to voters by using swipe cards used by some governments for transit facilities. Bitcoins do not provide a viable medium of exchange because of the cost of their purchase, creation and/or exchange. Self-liquidating paper based "Stamp Scrip" privately issued in Europe and the US in the Great Depression minimizes the complications and cost of money creation and/or exchange. Self-liquidating money was called "Speed" money because it circulated faster. Its private issue again in Germany since 2003 demonstrated its acceptance and attraction for Governments to introduce digital Speed money.

Keywords: *Digital currency, Stamp Scrip, Tagged-currency, Tethered currency, Terminating money.*

Introduction

The research goal of this paper is to identify how digital terminating currencies might best be designed to provide a superior fallback position to Bitcoin in a financial crisis and/or provide a basis for rehabilitating distressed economies. A distressed economy could be a region of a nation, a nation State including a member of the Euro zone.

Digital technology has introduced new ways for creating and managing money like the Bitcoin (Nakamoto 2009). There are now hundreds of competing crypto currencies with various features. Orthodox knowledge, learning and practices concerning money offer little guidance in a digital age. We need to think afresh and go back to common sense basic principles as to why we need money, to do what, and what are the new types of money that are "best fit for purpose?" (Turnbull 2014).

A contribution of this paper is to identify how technology over the last decade has introduced new options for answering such questions that did not previously exist. Past theories of competing currencies as presented by Hayek (1976a, 1976b) did not anticipate forms of money in which its role was no longer a store of value that arose when considering terminating currencies. Nor have past theories considered that the same unit of account could have different

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values in different currency regions as considered by Mundel (1961) or that the value of a currency could be determined independently of the financial system as considered in this paper.

Another contribution of this paper is to complement traditional monetary policies based on the 3Ts of Timing, Transmission and Traction with the 3Ts of Terminating, Tagged and Tethered to describe characteristics of money that digital currencies facilitate. However, the focus of this paper is not to review theories but to identify pragmatic options available for the private sector, policy makers and their governments if a crisis arises to provide "Financial life boats" (Turnbull 2013b). Unlike the current approach of introducing Quantitative Easing (QE) for financial institutions, this paper considers QE for voters, small and medium sized enterprises (SME's) and so also for their host economy. The misnamed "quantitative easing for people" proposed by the UK parliamentary opposition leader does not distribute either Terminating or official money directly to people but to infrastructure projects (Elliott 2015).

In a crisis, solutions need to be quickly applied based on creditable practical experiences that can obtain political, economic and social acceptance. However, there was minimal consideration during the financial crisis of 2008 or the Greek crisis in 2015 of the private sector solutions documented by Fisher (1933:12) involving "self-liquidating" and so terminating money described as "Stamp Scrip". Terminating money could also be promoted and facilitated by governments and/or promoted by international institutions like the "Troika". The Troika refers to the International Monetary Fund (IMF), The European Commission of the European Union (EU), and the European Central Bank (ECB). Fisher (1933: 2) identified how terminating money in the form of "Stamp Scrip" carried out a "priming the pump" function for an economy that would allow current Troika policies of austerity to be replaced with prosperity.

The Greek crisis of 2015 would have been an ideal time for the Troika to experiment. Medical experiments on new cures become acceptable when known approaches do not work. Importantly for democracy, the Greek citizens had both elected a government and voted in a referendum that sought to deny orthodox policies of austerity. While some commentators like *The Economist* (2009) and Monboit (2009) raised the historical solutions, these were not reported as being considered by either the Greek Government or the Troika. The author introduced these ideas in two presentations in Greece in 2015. The Thessaloniki Chamber of Commerce and Industry with the Aristotle University Law School hosted the first presentation on June 2 (Turnbull 2016). The other presentation being an earlier version of this paper presented to the 3rd, Annual International Conference on Politics and International Affairs in Athens on June 15th.

The lack of interest in considering digital versions of historical practice might be because the modern monetary theory has not developed to consider new types of money that are not a store of value, are self-liquidating from a negative interest rate, with every transaction traceable because the money is tagged like Bitcoins. Such forms of 3T money could still create a unit of account by being tethered to a unit of value like the kilowatt-hours (Kwhs)

generated from locally produced and consumed renewable energy (Turnbull 2010b, 2015).

The various types of 3T currencies introduce quite different concerns from the monetary theory that assumes that only governments can create money and money has the same form with monetary policies focused only on the 3Ts of policies of Timing, Transmission and Traction.

Bitcoins and the lessons of history reveal that governments are not required to create money. Ali, et al. (2014) noted that the distributed ledger of the Bitcoin technology had the potential to replace central banking with decentralized banking. An outcome anticipated by a number of authors including Goodhard (2000), King (1999: 47) and White (2001). However, unlike official currencies or various forms of 3T money Bitcoin is very expensive in real resources of computer time, energy expenses and time to create or validate transactions (Extance 2015).

The energy required to mine Bitcoins is increasing rapidly as its block-chain gets larger. Limer (2013) reported power costs of \$150,000 a day. Today the problems and costs are greater as the size of the block chain is expanded with every additional transaction. Bitcoin miners need tons of equipment to cool down their computers. As a result, miners are setting up in Iceland (Cuthbertson 2014).

Münchau (2015b) reported that the Greek finance minister suggested using digital "Future Tax-coins" (FT-coins) and that they "could use a Bitcoin-like algorithm in order to make the system transparent, efficient and transactions-cost-free". The Greek Finance Minister was reported as stating: "Greece will adopt Bitcoin if the Euro group doesn't give us a deal" (Papapostolou 2015) and suggested that Bitcoin could be used as a weapon against inflation (Suberg 2015). Suberg confirmed that this would create a "national supply of Euros that is perfectly legal in the context of the European Union's Treaties".

However, the Bitcoin technology is not "transaction-cost-free" nor is its valued tethered to be a "weapon against inflation". Every Bitcoin needs to be tagged to prevent any to be electronically duplicated. New Bitcoins need to be "mined" by not only solving a complex mathematically problem but doing so in competition with others and then to obtain an agreement and form a majority of all Bitcoin holders. This requires massive computer power, communications and energy, as well as time that make the cost and speed of creating or transacting Bitcoins increasingly less attractive as more are created.

While theorists cited above have questioned if central banking will exist in the future, few have questioned if the current architecture of official money is fit for purpose for also being: 1. a store of value and 2. establishing a unit of value for pricing real resources to allow their allocation to be determined only by market sources (Joye 2014). Likewise, QE has been introduced not based on much theory or empirical experience, according to Joyce et al. (2012).

Ten reasons for questioning if the current form of official money is fit for purpose are presented in Turnbull (2016). They arise from: 1. Centralized control of money (Wray 2004, Jacobs 1985); 2. Incentives to invest in money rather than sources of prosperity (Gesell 1916, Keynes 1936, Suhr 1990); 3.

Wealth and income in-equality (Gesell 1916, Suhr 1989, Proudhon 1840); 4. Indiscriminate money creation (Ricks 2011); 5. Undemocratic sources of money creation (Turnbull 2013a); 6. Monopolization of money (Hayek 1976a, 1976b, Mundel 1961, White 1993), 7. Inflation (Hayek 1976a, Münchau 2015a), 8. Volatility in the value of money (*The Economist* 1990b, 2014), 9. Volatility in the relative value between currencies (*The Economist* 1991, 2014) and 10. "The biggest market failure the World has ever seen" (Stern 2006).

To parsimoniously answer the research question, this paper will not attempt to comprehensively consider what types of currencies might be best fit for purpose. Contributions to this topic are provided in Turnbull (2009, 2010a, 2010b, 2011, 2012a, 2012b, 2014, 2015, 2016). Nor will this paper consider the advantages and disadvantages of the 5,000 or so different community currencies catalogued by the Complementary Currency Research Community (CCRC 2014). However, it is worth noting that the Brazilian Central bank has approved supplementary social forms of money to be used in many communities and cities (Freire 2009).

The history of terminating paper money is considered in the following Section. Evidence of the political, economic and social acceptance of terminating money is considered in Section three. The closing section considers issues arising from introducing terminating money in response to a crisis and also on an ongoing basis.

History of Negative Interest Rate Paper Money

Gesell (1916) conceived a practical way of creating terminating paper money by requiring stamps to be affixed to notes at specified times. Such cost carrying or negative interest rate money had been common over the millenniums for commodity money as reported by Suhr (1989: 110). Gesell's objective was to remove the unfair advantage of paper money earning income indefinitely from interest when other assets lose value. It made money more "neutral" as a commodity (Suhr 1990). Gesell had proposed that a stamp of 0.1% of the face value of the notes should be affixed every quarter to create a negative interest rate of 5.4% a year. Keynes (1936: Chapter 23, part VI) supported the idea and referred to Gesell as an "unduly neglected prophet". Keynes thought the rate "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". Contemporary supporters of negative interest rate money are Buiter (2009) and Menner (2011).

In practice the negative interest rate accepted was much higher than that proposed by Gesell or Keynes. Initially, the notes described as "Stamp Scrip" began circulating in Germany in 1919 (Fisher 1933). They were like modern "Flybuy" points redeemable into goods in a number of stores. To maintain their purchasing power a stamp of one percent of their face value had to be affixed on the back of each note every month. The compound interest cost of over 12%

p.a. provided an incentive for the holder to redeem the notes into goods rather than into cash at a bigger discount.

Interest in Stamp Scrip spread internationally when the owner of a Bavarian coalmine used it in 1928 to pay his workers to resuscitate his mine. The notes redeemable into coal incurred a storage fee for the coal of 1% per month. This inspired the Mayor of the Austrian town of Wörgl to use Stamp Scrip in 1931 to resuscitate its economy. The same 1% per month negative interest rate was applied with a 2% cost to redeem the notes into Austrian Schillings. Fisher (1933) reported that the Wörgl success generated a worldwide interest in Stamp Scrip at the height of the Great Depression. It spread to a number of European countries and to the US.

Fischer wrote "Stamp Scrip" (1933) as a handbook to guide the many US communities who introduced various versions of what was also described as "Speed Money". A common version of Speed money adopted in the US required stamps valued at 2% of the note to be affixed each week. The revenues obtained by the issuer from the sale of stamps over a year became $2\% \times 52 = 104\%$. This allowed the note issuer to redeem the notes after a year and make a 4% profit *even if the notes were given away!*

Fisher (1933: 14) reported that the velocity of the notes were four times quicker than the US dollar in normal times. In the Great Depression, the US dollar velocity reduced to a third making Stamp Scrip 12 times quicker. Privately issued Speed money began circulating in Germany again in 2003. The notes tethered to Euros required stamps of 2% of the face value but only every quarter. They circulate three times faster than normal Euros (Gelleri 2009:15). Gelleri also reported that the velocity of normal Euros, \$US, Yen and British Pounds have decreased in recent years.

At the same time the global volume of money used for World Trade has become less than 2% of the total money in circulation as the rest was used for speculation. This reveals the monetary burden created by official money. The cost of the monetary bubble has been increasing by a process described by Palley (2008) as "financialization". This process is exacerbated by the transaction costs of official money. While the transaction cost of Speed money with a 104% annual negative interest rate appears highly excessive, and so not socially or politically acceptable, official currencies incur even higher costs.

Consider a SME with \$200K sales per week and so revenues of $\$200k \times 52 = \$10.4M$ p.a. The cost of accepting credit card charging 2% commission for all sales would become \$208K p.a. If instead the SME accepted the Speed money costing 2% week that was banked only once per week, the average value of Speed money held over the week would be half the weekly revenues of \$200K being \$100K. The SME would incur an average negative interest rate cost of 2% a week on \$100K being \$2K or \$104K p.a. *So Speed money would allow merchants to half the cost incurred in accepting credit cards.* The cost of Speed money would be much lower if merchants banked Speed money daily instead of weekly. As there are more merchants that vote in general elections, than credit card firms and banks, Speed money could be both commercially

and politically attractive even with a 2% cost per week. Speed money would also at least halve the current cost of "financialization" of modern economies.

The Bankhead-Pettingell Bill introduced into the US Congress on February 17, 1933 indicates the potential for Speed money to provide a compelling political attraction for governments of distressed economies. The Bill was introduced 15 days before the inauguration of President Roosevelt. The Bill reproduced in Appendix I of Fisher (1933) provides a model for contemporary governments of distressed economies. The main change required would be the need to substitute the issue of government debit cards for paper money. Debit cards and/or cell phones can be recharged over the Internet. The Internet also provides a way for the issuer to collect the negative interest payments.

The most significant features of the Bankhead-Pettingell Bill were: 1. The US Treasury, not the Federal Reserve Bank, that would make the Trillion-dollar note issue, and 2. The US government owned Post Office that would sell the stamps. Stamps valued at 2% of the face value of the notes were required to be affixed each week. The notes issued were to be redeemed by the US post office. This would have yielded the US government who owned the Post Office a net profit of \$40 billion after giving away \$1 trillion.

All the \$1trillion was to be distributed to each State in proportion to their population. Half was to be spent on citizen welfare and the other half on building infrastructure projects. Speed money allows governments to distribute prosperity directly to voters instead of inflicting austerity. The Bankhead-Pettingell Bill would have introduced QE on a grand scale for voters instead of bankers. A government issue of Speed money provides compelling attractions for both the government and citizens. Especially compared with the alternative of enduring higher austerity with increased taxes.

However, 19 days after the Bankhead-Pentegill Bill was introduced, the bankers won over the newly inaugurated President Roosevelt to call an emergency joint meeting of both houses of Congress on March 9, 1933. There was no time to print the first Bill of the New Deal for bankers that increased the powers of the Federal Reserve to finance the US government. So the Bill was read out aloud by the chair of the Banking and Finance Committee, Congressman Steagall. The sense of urgency denied the Bill to be properly considered. The new President signed the Bill into law the same day to deny to the US government the opportunity of becoming independent of the bankers who owned the Federal Reserve Bank. The US government has been in debt ever since.

The following year an association of SMEs in Switzerland established a mutual credit system called the Wirtschaftsring (WIR) or economic ring (Greco 1994). The WIR originated by creating credit with a negative interest rate (Studer 1998) with its value tethered to, but not convertible, to the Swiss Franc. The WIR is now the oldest and largest private complementary currency system in the World being used by over 70,000 enterprises. It demonstrates the viability and practicality of a privately issued currency. It even has its own SWIFT code for making bank transfers. Stodder (2005) reported that privately

organised complementary exchange systems such as the WIR and the International Reciprocal Trade Association (IRTA) founded in the US in the early 1970's increases macroeconomic stability.

When Speed money was introduced again as a Waldorf school project in 2003 it was described as Chiemgauer Regiomoney (Gelleri 2009). Encouraged by Kennedy (1988), a number of other privately initiated Regiomoney systems were established in Germany with their money tethered and convertible into Euros (Migchels 2012). A Regional Money Association was established with the author as a guest speaker at its first meeting in the Traunstein Rathaus on February 4th 2006. The Chiemgauer established collaboration with a local bank and has been rapidly increasing its turnover. Two thirds of its turnover is activated by mobile phones.

When the European Central Bank (ECB 2012) reviewed "Virtual Currency Schemes" that included Bitcoins it did not suggest that privately issued complementary currencies tethered to Euros were not legal, only that they introduced "uncertainties for their users". This remark is especially relevant to Bitcoins that have no tether to any unit of value or any official currency. The option of establishing an independent tether for Speed money is included in the following Section.

Other Options for Designing Digital Money

Advances in technology have resulted in official currencies around the world becoming largely digitalised. The use of notes and coins has decreased with the use of credit cards, debit cards, and the Internet facilitating electronic banking by numerous devices and applications. The emergence and acceptance of Bitcoin as a decentralised self-managing currency with a distributed ledger has introduced new thinking about money and credit.

Bitcoins have forced governments to decide if it is a taxable speculative commodity or a form of money not subjected to transaction taxes. At a 2014 Australian Senate inquiry to consider how Bitcoins should be taxed, evidence was provided that if every private key of Australian use of Bitcoin became registered with the tax office then every transaction would be traceable by the tax office (Tucker 2014).

Should Government Issued Digital Money Be Tagged?

This raises the question if official digital currencies should be tagged and so traceable like currency notes with their serial numbers? However, with a digital currency like Bitcoin it becomes possible to identify each holder of the currency. The Australian tax office already requires all interest payments and all dividend payments to be reported directly by those making the payments. The tax office then informs tax payers each year, before they are required to complete their tax returns, about the total income from such sources.

If all government digital money was traceable like Bitcoin then the tax office could issue to all taxpayers a cash flow statement of all their transactions each year. Taxpayers would avoid accounting costs and would need only specifying the tax status of each transaction. However, this raises privacy issues. Giles (2015), the Economics Editor of the *Financial Times* suggested that it would lead to "Tyranny". The comment by Giles arose from the proposal of Haldane (2015), the Chief Economist of the Bank of England to eliminate cash to allow official money to have a negative interest rate. Beside the Bank of England raising the possibility of introducing a digital currency, the UK treasury announced it was spending £10 million to research opportunities (Treasury and Leadsom 2014).

One argument for tagging money is to make the unreported economy visible. The World Bank has estimated that the size of the unreported or so called "black" or "shadow" economy can be a significant percentage of the GDP (Schneider et al. 2010: 25-27). In Australia the estimated average figure for the period 1999 to 2007 was 13.8% of GDP. This indicates the extent that the government is losing taxes from both unreported profits and its goods and services taxes. Other countries like Greece and Russia had estimated unreported transactions of respectively 27.3% and 43.6% of their respective GDP. However, as noted by Berentsen (2015) removing notes and coins may not necessary eliminate illegal payments.

There are many near money substitutes to mediate fraud, bribes and the funding of terrorists. Eliminating notes and coins could however inhibit such transactions and reduce transaction costs and time in using money. An Australian butcher shop refused the use of notes and coins for health reasons (James 2015). In 2014 there were media reports that nations like Sweden, Somaliland, Canada, Kenya and South Korea were moving to a cashless society (Kingdom Economics -The Future Is Now 2014). The convenience of a cashless society could make acceptance in some form inevitable.

However, while all cash may become digitized it may not be politically viable for all official currency to be tagged. But it could be politically acceptable for a proportion to be tagged, specifically, government expenditure on welfare payments, especially in a distressed economy. Even in a non-distressed economy, the Parliament of Australia (2015) passed legislation to allow it to only pay welfare to Aboriginals through debit cards that would deny them making expenditures on gambling and alcohol.

One way the citizens of Wörgl were encouraged to accept Speed money that arose from the Mayor, undertaking to accept half his salary in Speed money. Likewise, a distressed economy, government employees including politicians could be partially paid in tagged Speed money. In the case of making government welfare payments, it could be both politically and socially acceptable to make all payments tagged.

There are many monetary substitutes that may be used for illegal and various nefarious activities. This leads to the question of if a unit of value should be determined?

How Should The Value of Currency Be Determined?

As a matter of practical expediency, it makes good sense for any emergency issue of Speed money to be tethered to the official currency for providing citizens and SMEs with "Financial lifeboats" (Turnbull 20013b). However, for arguments presented in Turnbull (2014, 2016) it may not make good sense for this to continue indefinitely.

The problem with accepting any existing official currency as a tether over the longer term arises because the value of any official money cannot be defined in terms of any one or more goods and services. Globalization has resulted in no nation being able to determine the value of its own currency. The value of all official currencies has become self-referential and subject to changing terms of trade, QE in difference countries, foreign exchange controls, constant manipulation by central banks, changing monetary policies, currency wars, hedge funds, arbitragers and speculators.

Yet prices for allocating real resources are determined by money values that are not connected to real resources. This raises the question why a social construct like official money isn't definable in terms and if any specified one or more real things should be used to allocate real resources?

When the idea of establishing the Euro was being considered, the cover story of *The Economist* (1990) was "Time to tether currencies?" If prices are not related to any specific goods or services there is little rational basis to expect that the "invisible hand" of Adam Smith could "efficiently" allocate real resources (Turnbull 2009). While this may not negate the reasons why firms exist "to make" rather than "to buy" components of goods and services through the market as argued by Coase (1937), it undermines the logic and reason for efficient co-ordination of firms and individuals to allocate real resources.

The Economist (1990: 9) stated that "The time has come to peg currencies again" but that: "History offers no entirely convincing model" on how this might be achieved. They specified two conditions for achieving this objective:

1. to succeed, a system of fixed exchange rates must be credible. If financial markets expect the exchange rate to be changed, the battle to keep it fixed is nine-tenth lost.
2. and the system should have price stability built securely into its fabric.

A common proposal for establishing a reference value is to establish a basket of commodities that reflect their consumption. But this has a number of fundamental weaknesses. One is a governance problem of the "who", "how" and "when" for changing the mix of commodities as changes in the pattern of consumption changes. A more fundamental problem is that the criteria for making any change needs not be determined by the ability of the environment to sustain humanity on the planet. Stern (2011) stated that climate change is "The biggest market failure the World has ever seen".

To connect the ability of humanity to sustain both the environment and society in perpetuity a hypothetical model currency is suggested whose value is determined by the value of Kilowatt Hours (Kwhs) of electricity generated from benign renewable energy resources in each bioregion hosting society. There are five compelling reasons for pegging the value of money to Sustainable Energy Dollars (SEDs=\$Z) produced in each bioregion:

1. A relative cost advantage is achieved for generating renewable energy to reduce and/or remove the need for carbon trading or taxing (Turnbull 2010b). The cost advantage arises as interest costs are removed for investment in electricity production from any source. As the investment cost of generating electricity from renewable energy are much larger per Kwh generated than from burning carbon, renewable energy becomes more competitive.
2. Energy consumption correlates well with GDP (Gogerty and Zitoli 2011).
3. Energy consumption is an essential requirement to sustain prosperity in modern societies. So energy consumption is also an indicator of the quality of a sustainable society.
4. A single service of nature that is so fundamental for sustaining life on the planet in perpetuity provides a basis for a highly participative, transparent and democratic governing architecture to minimise self-interested manipulation by minority interests that could arise from using a basket of commodities whose composition would need to be changed over seasons, regions and technological change by governing elites in each region without necessarily recognising long term sustainable issues like climate change.
5. Market forces are created for distributing the global population to bioregions that possess advantages in the production of \$Z.

In regards to the last reason, benign renewable energy sources exist in most regions of the world but some require less investment than others. While \$Z would represent a global unit of account, its value would change according to the local cost of production. Its value would change according to how well nature had endowed each region with the most economic benign renewable energy resources.

The operating life of the generators could vary from 25 years or so for solar, wind and waves to a much longer duration for hydro and bacterial electricity. However, as long as production was averaged over a bioregion by a producer/cooperative, changes in non-renewable resources of production would occur slowly, and on a reasonably predictable basis as legacy technology was replaced with more efficient technology during the 25 year plus minimum life span of the technology. A non-volatile reasonably stable and predictable average unit of value would be established, monitored and controlled by a large number of retail suppliers/consumers.

Unlike current floating untethered fiat currencies, reasonable estimates of sustainable future value could be undertaken for 25 years or more. Unlike the fixing of foreign exchange prices or LIBOR that involves a few dozen institutions operating on a private and covert basis to maximise their profits, there could be millions of producer/consumers supplying/buying benign sustainable electricity with a democratically controlled cooperative on a fully transparent basis. While no system is fully satisfactory the above proposal provides a compelling basis to meet the two tests specified by *The Economist* (1990: 9) for establishing a fixed tether for each bioregion to define the regional value of \$Z.

Table 1. Comparison of Official Digital Money With Sustainable Value Money (\$Z)

	Difference	Official digital money	Sustainable value money (\$Z)
1	Money created by:	Government & Banks	Preferably consumers, producers, traders and investors
2	Interest rates set	Central Bank	Cost of risk ins. & redemption
3	Expansion of	Government	Value of market transactions
4	Value defined by:	Government fiat	Benign renewable electricity
5	Unit of value	Not defined	Renewable Kwhs (\$Z)
6	Store of value	Yes, subject to inflation	Not a store of value
7	Integrity of value	Indeterminate	Tethered to renewable Kwhs
8	Integrity of system	Exposed to contagion	Little exposed to contagion
9	Choice of currency	Government monopoly	Determined by currency region
10	Inflation control	'Blunt' policy instruments	Value of renewable energy
11	Structure of	Unlimited accrual of	Usage fee, limiting life
12	Economic flaw-1	Incentive to own money	Disincentive to hold money
13	Economic flaw-2	Allocates resources to	Real assets more attractive
14	Economic flaw-3	Distorts price relativities	Prices set by renewable energy
15	Financial system	Ever increasing	Minimized
16	Financial	Ratio increases	Incentive to minimize
17	Economic growth	Required to pay interest	Accommodates de-growth
18	Social flaw-1	Compounds unearned	No unearned income
19	Social flaw -2	Concentrates influence	Localizes influence
20	Political flaw-1	Concentrates power	Enriches local democracy
21	Political flaw-2	Low accountability	Cooperative accountability
22	Environmental	Incentive to burn carbon	Favors renewable energy
23	Environmental	No feedback from nature	Nature controls price signals
24	Ecological	None	Local renewable energy service
25	Sustainability	Highly questionable	More likely

Source: Prepared by Author.

Once an agreed standard unit of value had been established like \$Z, then the need for either a distributed or centralised ledger is not required for a Speed currency that is self-terminating from the proceeds of its negative interest rate.

The existence of "sustainable value money" would allow any trader or investor to enter into private contracts denominated in the standard unit of value. The conversion of such private contracts into being used as public money would require that a creditable third party publicly guaranteed their self-liquidation. This could be provided by local governments but preferably by mutually owned democratically controlled credit insurance institutions for a fee. Part of the fee could be added to the negative interest rate charges.

The credit insurer would guarantee the liquidation of any credits created. This was a traditional function of banking. However, like the London Lloyds insurance operation credit insurers would be backed by security over the equity of individuals and institutions in real assets. Default of any insured credit that exceeded current insurance fees would require real assets/savings to be liquidated. This should keep in balance the funding of new investments intended to facilitate trade, production and increased productivity and prosperity with real savings created by the investment.

The redemption cost of \$Z would be covered by its usage fee remitted to its issuer as the money circulated. It would not need to be at the emergency rate of 2% per week unless the credit guarantee fee was to be included in its usage fee. As shown above a fee of 2% a week is less than the cost for consumers and merchants paying credit card commissions on every transaction per week. This indicates the excessive cost and inefficiency of the existing financial system that has increased from less than 8% of the GDP in advanced economies at the beginning of the 20th century to more than double this century.

Table 1, "Comparison of official digital money with sustainable value money (\$Z) " has been constructed on the basis that the creation of \$Z arises from producers, consumers, traders and/or investors, but not speculators or derivative traders, financing their transactions by insuring such credits that they may need with a mutual credit insurance facility. The creation of \$Z would then be kept in balance with the demand of society for funding trade, production and the means for increasing productivity. The present system allows the money supply to be increased for non-productive purposes including speculation, political reasons and/or to support distressed banks and other institutions.

The non financial institutions required establishing a standard unit of value and the credit guaranteeing institutions required to convert private contracts into public money which may take years to develop. But they provide a vision for how sovereign States and/or bioregions could obtain responsible financial independence from the current problematical interlocked global system. The first step is for governments, regulators and international financial institutions like the troika to facilitate and nurture money experiments. Instead of proposing austerity when the next financial crisis arises, governments or even private institutions should be encouraged to issue Speed money as a supplementary currency to provide citizen and SME liquidity instead of QE for bankers.

Concluding Remarks

This paper identifies self-liquidating, terminating digital (Speed) money tethered to the existing official currency as a politically, socially and economically attractive basis for providing emergency liquidity in a financial crisis. A digital currency not only makes terminating money practical but also its' tagging. However, there could be political and social reasons why it may not be acceptable for tracing money to be universally applied. An acceptable application of tagging Speed money could be for government payments to welfare recipients to limit its misuse and increase their accountability as being trialled in Australia.

In the case of a distressed economy like Greece, the government could replace the use of externally created standard Euros ("slow") with Speed Euros for welfare payments and the part payment of government employees. This would release slow Euros to pay external obligations. Speed Euros may also become acceptable outside the issuing nation, especially if a member of the Troika guaranteed their liquidation.

The issue of Speed money could be initiated by local, provincial or national governments tethered to official money within the Euro region or in other jurisdictions to their official currency. In the event that government authorities did not act in a crisis that limited the availability of official money then it is also possible for Speed money to be issued privately as it was during the Great Depression.

The Sustainable Money Working Group (SMWG) was established in the UK in 2011 to privately promote Speed money to create financial lifeboats for citizens and/or SMEs in the event of another crisis. The two objectives of the SMWG (2011) are:

1. Sustain SMEs by providing alternative sources of liquidity in the event that a financial crisis deters banks from providing finance;
2. Establish a basis to develop a crisis and inflation resisting financial system that can also protect and nurture the environment to sustain humanity on the planet.

Members of the SMWG included membership organisations such as: The British Chambers of Commerce (BCC) whose member businesses employ over 4.8 million citizens; Coops UK Limited who represent 13 million citizens; The Institute of Chartered Accountants in England and Wales, and the New Economics Foundation, a "Think and do tank". The BCC became a founding member of the SMWG even though its CEO was uncertain if a private issue of Speed money might be legal in the UK. He speculated that even if it were not legal, the government would change the law in an emergency. However, the discussion above reveals that the legality of Speed money is not an issue in Euro zone countries.

There are considerable economic and political attractions for governments to issue self-liquidating money. Speed money is costless to create, unlike

Bitcoins. Bitcoins need to be purchased and this involves agents, transaction fees and the distribution of digital purses capable of processing a cryptocurrency. In any event Bitcoins do not have any tether to determine their value to reduce price volatility and uncertainty in their future value.

There exists the possibility that future technology could reduce some of the disadvantages of Bitcoins. For example, Black et al. (2014) have created "pegged side chains" that could limit the size and so cost and time of creating new units and recording their transfers. But Black et al. make the point that a currency based on this technology would need to carry the cost of such transfers to create in effect a negative interest rate as found in Speed money. There exists the possibility of side chains being tethered to the value of an official currency, or to a standard unit of value like \$Zs.

The mining of new Bitcoins at present subsidizes the cost of recording each and every change of coin ownership in the block chain. When mining ceases from the inbuilt limit in the Bitcoin technology of 41 billion coins or because the demand for new coins ceases then the cost of maintaining a distributed ledger of all transactions will need to be paid for by the users of the technology. So Bitcoins, like pegged side chains, would also take on some of the characteristics of the Speed money but without other benefits of Speed money identified in Table 1.

One can conclude that crypto currencies will follow the example of historical forms of commodity money that incurred costs of creation, storage and transacting. These costs became hidden with official money from it being subsidized by fractional banking that allowed bankers to create money "by the stroke of a primitive pen" (Galbraith 1975: 19).

Unlike QE with official money, Speed money is less likely to be inflationary. Government created Speed money can be created without creating debt. Privately created Speed money like \$Z is self-liquidating from its negative interest rate and/or is cancelled by its creator when used as a medium of exchange and/or by its credit insurance.

Unlike the QE that only funds the banks, Speed money can be issued directly to voters and SMEs. The criteria for issuing Speed money to SMEs could be based on the number of people employed rather than the financial viability of the SME and/or the securities that the SME could offer to the bankers.

Governments could distribute Speed money directly through the Internet using debit cards currently issued by banks or through cell phone applications or other forms of digital purses. The Government could issue a debit card like the "Oyster" card used for the London underground or the "Opal" card issued by the NSW government in Australia that can acquire value through the Internet. By these means Governments could replace taxpayer or debt funded welfare expenditure with Speed money. Speed money could be tested without a crisis by Governments issued to welfare recipients and partial payment of remuneration to government officials. The ability of Speed money to co-exist in competition with existing official currency is demonstrated by its spread over the last decade in regions of Germany.

It would seem that cost carrying money or a form of Speed money could be the inevitable future for any democratic form of digital currency. It is recommended that monetary regulators and institutions begin testing Speed money before a crisis forces its reintroduction by Sovereign States, regional governments and/or private interests as a matter of expediency.

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