`How Debt Free Public Money can Supercharge the American Economy:
A Monetary Transfusion for Economic Rejuvenation

by Ronald E Davis, PhD (Mathematics, Stanford, 1980)

INTRODUCTION

In early January 2012 I was standing in line at Frye's Electronics here in Silicon Valley when I noticed the Winter issue of The American Scholar on the magazine stand with the following words emblazoned across the cover:

BRING BACK THE GREENBACKS!

I could not believe my eyes! Having written a book on monetary reform way back in 1975, I knew immediately what this was all about; what I didn't know was that it was then considered "Okay" to speak about such things in academic circles. At that earlier time, I had not yet finished my PhD dissertation on the relationships between linear programming and dynamic optimal control systems at Stanford, and I made a strategic decision to hold off on publishing my book until I got my degree. Ultimately, I delayed publication of the book until retirement from my 30 year teaching career in the California State University System. Of course due to intervening events, and the natural learning process, the book must now be substantially updated to make it current, a process that is underway. This article is a preview of that upcoming book to be entitled something like "How Hybrid Public Money can save the American Republic."

Upon reading the 2012 American Scholar cover article entitled "How to Pay for What We Need" by historian Richard Striner of Washington University, Maryland, I discovered that I was in basic agreement with the thesis proposed. This was that the US Government should resume the practice of issuing debt free money that is spent, rather than lent, into existence, and that it should do so in tandem with the bank created money that would continue to be the major source of our money supply. This is what we mean by a hybrid money system, one in which some of the money supply is provided by the banks and some is supplied by the government, debt free. Debt free government money was issued in the Civil War era during Abraham Lincoln's administration through the issuance of about $450 million in US Notes. which were simply spent into the economy to pay government expenses during the war, and continued to circulate and be reissued in the economy for about 100 years thereafter, until the last bills were printed in 1971. At the time, these issues comprised about 20% to 40% of the entire paper money supply in the US, and constituted a major factor in determining the outcome of the Civil War. The US Note issues did not cause a major or lasting inflation, and their use would have most certainly been "indurated down to a fixture" as a permanent part of the US government had it not been for the assassination of Abraham Lincoln at the conclusion of the war. We make reference here to a London Times editorial circa July 1862, apparently written by associates of the Bank of England (see http://fourwinds10.com/siterun_data/business/currency/news.php?q=1345907722)

> "If that mischievous financial policy [of issuing debt free US government notes], which had its origin in the North American Republic, should become indurated down to a fixture, then that Government will furnish its own money without cost. It will pay off debts and be without a debt. It will have all the money necessary to carry on its commerce. It will become prosperous beyond precedent in the history of the civilized governments of the world. The brains and the wealth of all countries will go to North America. That government must be destroyed, or it will destroy every monarchy on the globe."

Although there are conflicting accounts of exactly when this appeared, it would have been most natural for it to have appeared just a few months after the initial 1862 Legal Tender Act that provided for issuance of the debt free US Notes.

Fortunately, the US government was not destroyed, however the money creation powers of the US government were effectively "privatized" by the Federal Reserve Act on December 23, 1913 by a compliant President Woodrow Wilson who later regretted his part in this heist of money creation power by private banks. Later he said

> "I have unwittingly ruined my country. A great industrial nation is controlled by its system of credit. Our system of credit is concentrated in the hands of a few men. We have come to be one of the worst ruled, one of the most completely controlled and dominated governments in the world… no longer a government of free opinion, no longer a government by conviction and vote of the majority, but a government by the opinion and duress of small groups of dominant men". –Woodrow Wilson
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> "Some of the biggest men in the United States, in the field of commerce and manufacture, are afraid of somebody, are afraid of something. They know that there is a power somewhere so organized, so subtle, so watchful, so interlocked, so complete, so pervasive that they had better not speak above their breath when they speak in condemnation of it."

Notice how President Wilson exhibits his own fear by not referring explicitly to the Federal Reserve System, though this is clearly what he is referring to. So the Federal Reserve System is effectively the Third Bank of the United States. The First and Second Banks of the United States were privately owned, and the Third one is too. The history of how the bankers met secretly in November of 1910 on Jekyll Island off the cost of Georgia to design the law to implement this essentially private system is well told in many sources, just google "secret meeting on Jekyll Island" to get a whole bunch of them.

Many monetary reformers argue that the Central Bank of the United States should be government owned, and a strong case can be made for that position. However, one of our goals in this paper is to show that the benefits of Debt Free Public Money listed in the Times editorial can be achieved by a resurgence of Public Money issues, even WITHOUT a government owned central bank. In fact, we argue that they can be had with only minor adjustments to the Federal Reserve System, thus paving the way for a smooth non-disruptive transition to a healthy sustainable economy. Nationalization of the FED, or creation of a separate government owned central bank, can be attempted when the Public Money tool has been proven effective based on experience with the proposed legislation given here, but would be extremely difficult to "sell" without having any recent experience with it.

Turning now to the proposed draft legislation, the presentation will be in three parts. In the first part, we cover the authorization for Government Created Money, and its application to two of the most important applications of it, emergency relief for natural disasters and funding for clean energy and infrastructure development. For reasons that are explained later, these can be funded without worry about inflation. In the second part we cover inflation, deficit, and debt control issues. And in the third part we cover social and economic justice issues that are greatly facilitated by the issuance of Public Money.

PART I – Authorization for Public Money and its use for extreme weather emergencies, clean energy, and infrastructure development

Title I – Government Authority to Create Money

So if the US government is going to start creating money again, one has to deal with certain fundamental questions right off the bat. Here is a list of the most pressing ones:

1. How and in what form is the debt free government money to be created?
2. By what mechanism will inflation be controlled?
3. What are the approved "first uses" of government created money?
4. Who decides the allocation of government created money?

Detailed answers to all these questions that we have developed, in the five years since reading Professor Striner's article in American Scholar, have been provided in draft legislation posted at monetaryreform-taskforce.net. It is recommended that you download and have a printed copy handy as you continue reading this article, which gives the rationales for what you find in the draft legislation.

The question of form is easily settled by considering the magnitude of the investments required to repair or replace the nation's infrastructure, with estimates varying from $3.6 to $4.6 trillion. These amounts go way beyond the scope of what can be done conveniently with paper money. In the modern age, most money is in the form of electronic credits in a monetary account balance stored on a bank computer somewhere. When new money is created for the government, therefore, we shall assume that it is in electronic form, and we shall call it Electronic Public Money (or EPM) to indicate clearly that it is created without any corresponding debt and credited to the main Treasury account for the benefit of the American people. Although greenbacks could be reissued as before, there is really no need to do this, and it is cleaner and free of logistical details, for the time being, to bring all new government created money come into existence as EPM. Hence the rally cry "Bring Back the Greenbacks" needs to be replaced now with

LET THE DEBT-FREE ELECTRONIC PUBLIC MONEY FLOW!

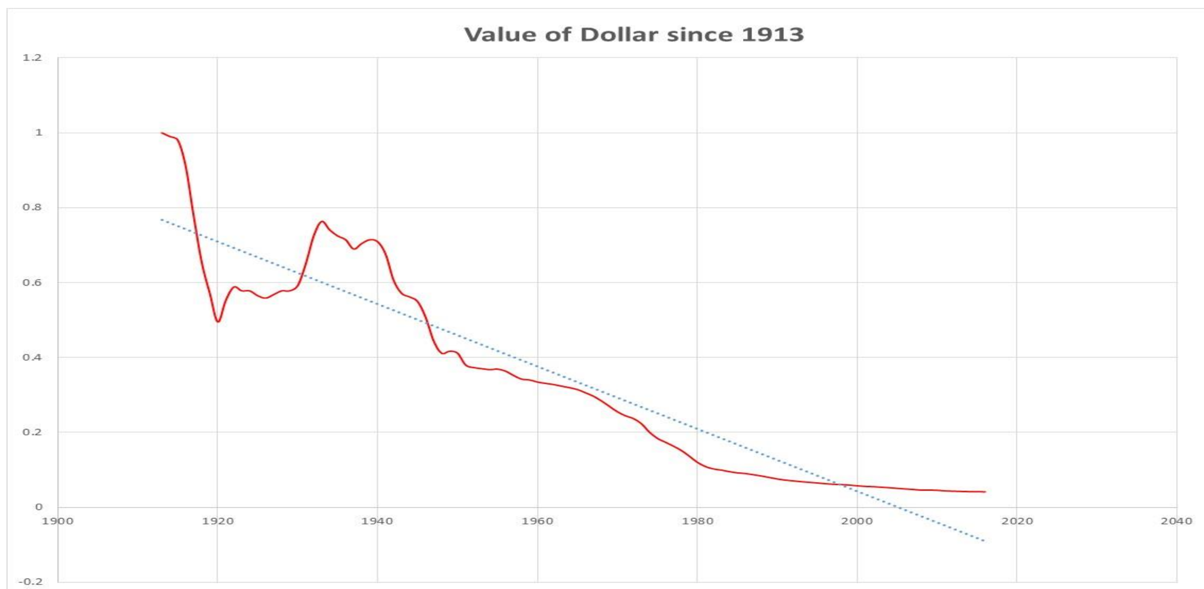
The question of how the new EPM is to come into existence is a bit more involved. Under the US Constitution, the power to create money (they expressed it as coin money, where the word coin, being in lower case, is used as a verb) is given to Congress. However, most congressional representatives have little or no background in economics, and are by their position naturally inclined to want to provide funding for projects that are located in their districts. So one has the specter of a Santa Claus Congress that spends way too much and causes a massive inflation that devalues the currency tremendously. To avoid this out-of-control spending spree, as a practical matter, it is clear that the Congressional power to create money needs to be delegated to an independent body that is staffed with knowledgeable economists and which is free of the desire to fund numerous pork barrel projects. Those promoting the Fed before Woodrow Wilson signed it into law in 1913 made this same argument, and said that the power to create money should be delegated to the Fed which would have the expertise and independence from political pressure to carry out the money creation process in a non-inflationary way.

However, there is a flaw in their argument, because although the Fed is independent from political pressures it is not independent of the profit motive of the banking industry. There is a ***huge conflict of interest*** built into the Fed, because the Fed banks are all private corporations and five of the Fed bank presidents vote right along with the seven Fed Board members to make monetary policy in the secretive

Federal Reserve Open Market Committee (FOMC) meetings. If the Fed banks are unanimous on any particular point, it only takes two votes from board members to carry the vote in their favor, which is almost always going to be the case, since several of the Board members generally have banking experience in their background. So the FOMC is under virtual control of the private interests even though it is made to look as if the Presidentially Appointed Board members can hold sway even when the banks are aligned against them.

The ability of Congress to ignore this obvious and blatant conflict of interest is striking. Would Congress allow defense policy to be determined by the defense contractors? Or energy policy to be determined by the Oil Companies? Or environmental policy to be determined by the mining and extraction companies? Or the FDA to be controlled by the pharmaceutical companies? Although corporate control over government policy has grown in recent years, as a natural corollary of the Citizen's United decision, nowhere is the conflict of interest more blatant and manifest as in the banking industry. Wilson and the Congressional dupes gave the monetary policy issues over to a committee essentially dominated by those who make a profit from creating money! Incredible!

Obviously, the banker's profit motive is going to induce the Fed to create more money than should be created. This is clearly seen in the following chart which shows the value of money since the inception of Fed operations in 1914. It is basically the inverse (reciprocal) of the Consumer Price Index (CPI) which is normalized to have a value of 1.00 at the beginning time period (1914).



This chart shows that under the Federal Reserve System the value of the dollar has dropped to about 1/25th of its former value. In fact, a dollar then could buy what it would take $24.32 to buy now. This corresponds to an average price inflation rate of about 3.21% per year. Clearly, the Fed has failed miserably in its responsibility to regulate the value of the dollar so that it maintains a nearly constant value over time. Using NASA type control models and computational forecasting techniques, the value of Public Money can be preserved much better in the future than in the past, very much better. This is covered in greater detail in Title IV, the Monetary Creation and Control Authority.

Title II – Emergency Extreme Weather Relief

Due in part to the impact of global warming, the 2017 Atlantic Hurricane Season has been particularly devastating. With Hurricane Harvey in Texas, Hurricane Irma in Florida, and Hurricane Marie in Puerto

Rico and the US Virgin Islands, total damages are in the vicinity of $300 billion dollars. Puerto Rico was particularly hard hit because of the accumulated adverse effects of the Jones Act of 1920 which have set the Puerto Rican economy back by around $80 Billion over the nearly 100-year time span. This accounts, in large part, for the $74 Billion territorial debt and the $53 Billion unfunded pension liability that it confronted even before the storm hit. Hence the Hurricane relief for Puerto Rico provided for in Title II includes some debt relief for the struggling territory as well as an accommodation for the Jones Act, which put private profits before public welfare. It was a mistake, and should be accommodated for. By funding emergency costs with EPM, the response can be faster, not detract from any other budget items, and also not increate the national debt by a single dime. The amounts involved in these events is so small, and the impact on future GDP growth so large, that these emergencies can be covered immediately, prior to establishment of the Monetary Creation and Control Authority, without concerns about inflation.

Title III – Creation of the Clean Energy and Infrastructure Finance Corporation

To facilitate the infusion of EPM growth stimulus into Infrastructure projects, it is proposed to reincarnate the successful Reconstruction Finance Corporation (1932-1957) as the new Clean Energy and Infrastructure Finance Corporation (CEIFC). The only reason for shutting down the Reconstruction Finance Corporation was that demand for the type of emergency loans made during the depression and the second world war dried up after the economy got back on its feet again in the fifties. However, for infrastructure, there is a need for both loans AND GRANTS since some infrastructure projects do not produce revenue streams that can be used to repay outstanding loans when they are complete. The benefits of these projects are diffuse and to many segments of society, so that the funding of them must be done by grants instead of loans. Or some combination of the two. Since the accumulated backlog of needed infrastructure projects stands at about $4.6 trillion, spread out over seven years, this would amount to a $700 billion annual investment, in loans and grants, from the CEIFC. However, since some of this amount would be for loans, which are recouped and then loaned or spent again, somewhat less than $700 billion can be allocated to the CEIFC after the first year.

There are several other aspects of boosting the GDP that go to issues related to infrastructure. One of these is the development of alternative clean energy technologies. We have an existing Office of Energy Efficiency and Renewable Energy within the Department of Energy. Currently, the renewable technologies fall into five categories: (1) solar, (2) wind, (3) geo-thermal, (4) hydro, and (5) bioenergy. Funding should be provided for five more, for example zero-point energy, scaler wave energy, anti-gravity energy, LENR, and self-powered electro-magnetic motors. Breakthroughs in these technologies could significantly reduce the use of fossil fuels and hence slow the progress of global warming.

As part of this Title III, the Congressional Office of Technology Assessment would be refunded to carry out objective scientific evaluations of new technology breakthroughs.

PART II – Inflation, deficit, and debt control

Title IV – Monetary Creation and Control Authority

So the solution we adopt is to create a new independent monetary authority which will be independent both of political pressures AND the private profit motives of the banking industry. Because this body will be charged with controlling the rate of money creation in accordance with the Constitutional stable value of money mandate, we call it the Monetary Creation and Control Authority, or MCCA. Members of this authority will be free of any connection to the banking industry and to the other three branches of government, doubly independent if you will. This will enable them to pursue monetary policy from a public interest point of view, driven by the three Congressionally mandated goals of full employment, strong growth, and stable prices. This does enlarge the size of government a little, but it will save trillions of dollars in the long run, so it is a prudent step to take. Why pay trillions in interest for what can be done essentially free? It is a no brainer once you look at the numbers.

With the MCCA in place (see legislative draft for details), the EPM creation process is as follows: The first step is that the MCCA (subsequent to a vote of its nine-member board) creates an EPM creation order for the Federal Reserve Bank of New York of a certain number of dollars, say $1 trillion for infrastructure investment, for example. This order is transmitted to the Secretary of the Treasury, who signs it and forwards it to the NY Fed president. The NY Fed president gives it to a technician, who creates a $1 trillion credit in a Fed account, which is then transferred to the principal Treasury Department account. There is no bond or debt evidenced by this process, the Treasury account balance is simply increased by the amount of the EPM creation order, and that new money is then ready to be circulated in the economy perpetually without it ever having to be repaid to the bank. Doing it this way will save trillions in interest in the future, and some of the money created can even be used to pay down existing debt, as we shall see.

The question of inflation control is a bit more complex under this hybrid system because there would be three sources for money creation: The Fed banks can create money, the Fed member banks can create money (through their lending activity), and the new MCCA can order the Fed to create money for deposit into the main Treasury deposit account. The inflation constraint applies to the total of these three money creation activities. Hence there must be coordination between the FOMC and the MCCA so that everyone knows what everyone else is doing. Organizationally, this is accomplished by having representatives of the Fed FOMC attend MCCA meetings, and having the Chair of the MCCA attend FOMC meetings. Moreover, the computer simulation programs based on macroeconomic forecasting models that are used for policy evaluation and analysis will be shared between them as well.

Title V – Deficit Reduction to Void the Budget Sequestration of the Budget Control Act of 2011

Blood in the human body is like money in an economy. It flows and it causes other things to be moved around in the body as well. There is a certain amount of it, which is related to the volume of the body in which it flows. Now consider what happens during a blood transfusion for sickle cell anemia. Blood is injected in one place, while being removed in another place. If the amount removed is the same as the amount injected, then the blood supply remains the same. If the amount removed is greater than the amount injected, then the blood supply will drop and the patient will have low blood pressure. If the amount injected is greater than the amount withdrawn, then the blood supply will increase and the

patient will have high blood pressure. Obviously, the plan should be for the two rates to be the same so that the blood supply of the patient remains constant. At the end of the blood transfusion, some of the blood in the patient will be new, but some of it will be old blood that was there before. Fortunately, in practice it is never necessary to do a 100% replacement of the blood, some substantially lesser percentage will usually suffice. For example, if a single 500ml bag of blood is injected (and an equal amount of pre-existing patient blood is withdrawn) in a patient having 5 liters of blood initially, that would constitute a 10% transfusion. Sometimes two bags are used, but rarely three.

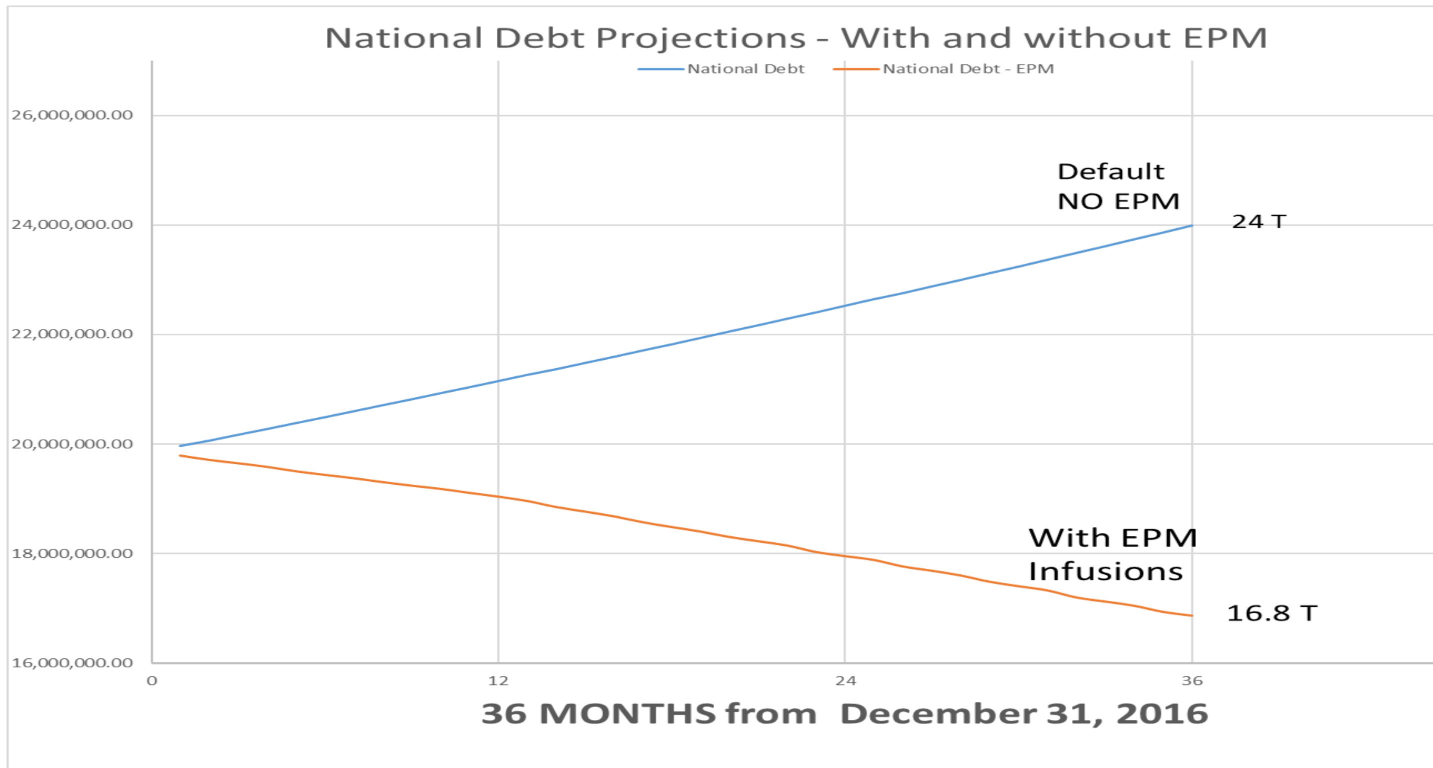
With that analogy in mind, the monetary reform plan we propose can be said to be analogous to a 33% blood transfusion. It is to be spread out over seven years, and begins very simply, as follows. When commercial banks create money for the loans they make, it is for use by the borrower, not themselves. They keep the interest part of the repayment, but when principal is repaid, that money must be extinguished. The same is true of the Federal Reserve Banks. When they buy US government bonds or other Treasury securities, they create the money with which to buy them. However, when such assets are redeemed, the principal amount must be extinguished. The interest earned, unlike in the case of commercial banks, is supposed to be returned to the Treasury, though lack of an annual GAO audit of Fed bank finances makes it impossible to know whether the interest is actually returned or not. But the point is, that the Fed banks both create and extinguish money. Now, when the Fed extinguishes money when Treasury assets are redeemed, the government just goes out and replaces the money extinguished by selling more bonds on the open market. This is called "rolling over the debt." What we propose is that the debt should not be rolled over; instead, the government should create new Electronic Public Money (EPM) to replace the money that the Fed has extinguished, thus replacing debt backed interest bearing money with debt and interest free government created money. This breaks the cycle of perpetual "borrowing from Peter to pay Paul" that will be our fate if a reform such as proposed here is not enacted. The Government Created Money does not have to be repaid to the government (except for what comes back in tax revenues) and circulates without any due date, that is, in perpetuity.

Now a great thing about replacing debt based money with government created money is that the EPM issues constitute a reduction of budget deficits, since they obviate the necessity of rolling over the debt. Hence the budget deficit is reduced, dollar for dollar, for each and every dollar substitution that is accomplished in this way. The inflow of EPM reduces the deficit and enables less borrowing to be done. And there is absolutely no inflationary impact of this new money, since it is merely a replacement for money extinguished by the Fed. The amount extinguished by the Fed is the same as the amount issued by the government to replace it, so the money supply remains the same, so there is zero impact on inflation. This inflation proofed method of reducing deficits turns out to be sufficiently potent to enable the harmful and distressing budget sequestration cuts required by the Budget Control Act of 2011 to be set aside. Hence, across the board budget cuts of 10% can be cancelled, and the government can resume normal funding levels for all of the budget items that were previously affected by the budget sequestration cuts. In fact, all of the EPM created as substitute credits in this way will be used to refund all budget items to their full levels sans sequestration (not new projects). This return to full funding for federal budget items will be a boost to the economy that will show up in job growth and enhanced growth rate numbers for GDP.

Title VI – Debt Reduction to prevent ever increasing National Debts

Turning now to debt reduction, this is easily accomplished by creating EPM to pay off intragovernmental debt, which is incurred when the government borrows from federal trust funds (primarily the Medicare and Social Security Trust Funds) to cover current operating expenses. According to Wikipedia, the value

of intragovernmental debt holdings as of February 21, 2017 was $5,531,705,453,238.55. At $150 billion per month, this could be paid off in about three years. In theory, the entire debt could be paid off in a single payment just as well, since there is no cost for the creation of EPM. But this might raise too many eyebrows to proceed in this manner. The money repaid to the trust funds is not for current period expenses anyway, so there is no need to rush the process. The duration of the repayment period will be adjusted by the actual legislators anyway, so we have chosen a nominal three-year time frame to get a national debt forecast that can be plotted against a continuation of current policy excluding EPM infusions. Here it is:



It is great to see the National Debt going down instead of up! And because the securities redeemed at the Fed in this time period is approximately $1.175 trillion and the amount paid back to federal trust funds approximately $5.531 trillion, the ending national debt with EPM injections is more than $7 trillion less that would be the case under a continuation of current policy. The repayment of intragovernmental debt is not in the slightest degree inflationary, because the formulas for Trust fund payments do not depend on trust fund balance. Put another way, payments to the Trust funds is money to be spent in future time frames, not currently. Also, the downward trend can be extended beyond three years by making debt payments to other categories of creditors, such as foreign nations that in other regards are treated as hostile nations. Why borrow from hostile nations when we can create our own? This will be seen to be noninflationary as well, since the money paid to foreign nations will not all return to the states right away, it will come back gradually.

So far we have shown how to set aside budget sequestration and put the National Debt on a downward trajectory without using a dime of taxpayer revenue money (it's done entirely with new EPM). There would be some gains in employment and GDP growth rate attendant with the refunding of the 10% budget sequestration cuts that are cancelled, and one might even try to get EPM started with just the first three titles in the draft legislation. But so much more, including major infrastructure investments, is

possible with the insights gained from a new standard for money that comes forth from just a bit of mathematical analysis. Please see the appendix below which covers the derivation of the Inflation Prevention Inequality and the Real Output standard for money.

Title VII – Periodic Partial Audits of the Federal Reserve System

In a democratic country, the identity of the stockholders of its Central Bank should not be shrouded in secrecy. Nor should its financial statements be secret, or the math models used for policy analysis. This information should all be in the public domain, and Title VII is a step in this direction. Additional steps could be legislated in subsequent phases of the monetary reform process.

PART III: Social and Economic Justice issues

Three other new offices proposed in the legislation are focused on increasing the percentage of the work force that are actually employed, another factor determining GDP. Some of these could be handled as amendments after the use of EPM had proved itself in the first couple or few years. These are the Office of Full Employment (in the Department of Health and Human Resources), the Office of Poverty Alleviation (also in HHR), and the Office of Conflict Resolution (in the Justice Department).

Title VIII – Creation of the Office of Full Employment

It has been said that the measure of any society is how it treats is poorest members. Among the American poor, there are three subgroups that stand out like sore thumbs in the eyes of the world. Namely, veterans, homeless, and the formerly incarcerated. This title provides that EPM can be created to hire the unemployed in these three categories to perform civic work such as inner city cleanup and beautification projects, picking up trash, and the like, as a paid worker. The EPM to fund such hires would be provided by the federal government, but the money would be granted to the States, Counties, or Cities who would do the actual hiring. Also, NGO projects promoting new employment opportunities at the local level, such as the Ujima Project in Boston run by the Center for Economic Democracy, could be partially funded with matching grants to accelerate the job creation process.

Title IX - Creation of the Office for Poverty Alleviation

The needs of the poor go far beyond the need for a job. They need health care, psychological counselling, food and shelter, and information relating to life enhancing opportunities in their locales of which they are unaware. They also need job training in the work skills that are needed by local business and industry. This title provides EPM funding for such projects, following the pattern developed by the World Bank. Whereas the World Bank offers debt relief, the Office of Poverty Alleviation would offer actual EPM funding which does not have to be repaid. Hence the results could be expected to be much better than those obtained by the World Bank.

Title X – Creation of the Office for Conflict Resolution

Most any domestic conflict can be resolved by a mediator equipped with an unlimited amount of money for one or both sides of the conflict. Although inflation prevention does imply some limit on EPM creation rates, never-the-less a substantial amount of money can be brought to bear on conflict resolution by the MCCA if it targets its investments wisely. For example, it could subsidize Flint Michigan enough so that Flint could buy clean water from Detroit Michigan rather than use the dirty

river water that is cheaper, but not fit for use by humans. And for the "Unite the Right" folks, a booklet on the principles behind the American Revolution could be prepared that explains that when Thomas Jefferson wrote "All men are created equal" that is to be understood as saying, in the modern world, "All men, women, and transgendered citizens of the USA shall be endowed with equal rights and protections under the law." In particular, discrimination based upon race, gender, religion, sexual orientation, or ethnic heritage is illegal.

Rationale for Monetary History Documentaries

Most people do not realize that both the Revolutionary and Civil Wars were won based on funding including government issued money. Nor do they realize that a hybrid money system involving government issued money has worked well in the Guernsey/Jersey Islands in the English Channel for about 200 years. Nor do they realize that Canada functioned well for thirty-five years using government issued debt free money. Awareness of these histories will enable legislators and the public at large to embrace government issued money again now to save the USA once again.

CONCLUSIONS

In summary, we have shown that government created debt free money in the form of Electronic Public Money can, at a minimum, achieve the following economic goals for the USA economy.

It can renew and replace infrastructure damaged by natural disasters such as hurricanes Harvey (Texas), Irma (Florida), Marie (Puerto Rico and US Virgin Islands), and record wildfires in California (Title II)

It can, through a new Clean Energy Infrastructure Finance Corporation, fund infrastructure at substantial levels designed to renew and replace all major American facilities in seven years. (Title III)

It can fund clean energy technologies that can substantially reduce dependence on fossil fuels and reduce the threat of climate change. (Title III)

It can reduce deficits enough to cancel the burdensome budget sequestration cuts imposed by the Banking Act of 2011. (Title V)

It can put the National Debt on a long term downward trend. (Title VI)

In addition, it can fund other measures designed to increase participation of able bodied persons in the work force and enhance quality of life for poor and middle income segments of the population. More specifically, the draft legislation provides for these additional "first uses" for supplemental EPM funding:

1. Emergency health care funding related to
   (i) natural disasters (Harvey, Irma, Marie) for which supplemental EPM funding may be routed through FEMA,
   (ii) man-made disasters (Flint MI water supply) for which supplemental EPM funding may be routed through state government agencies, and
   (iii) opioid drug addiction epidemics, for which supplemental EPM funding may be routed through SAMHSA (Substance Abuse and Mental Health Services Administration);
2. Emergency EPM funding for government operations if and when the National Debt Limit is reached which would otherwise force a government shutdown.

All of this without dipping into tax revenues at all, and restrained to the degree necessary to protect the value of the dollar. The question now is, will the American people have the courage to educate their legislators to the availability of these possibilities, and will Congress have the courage to overcome opposing lobbies and pass the enabling legislation. As Thom Hartmann says, democracy starts with you, tag, you're it. Please send a copy of this paper and the accompanying Draft Legislation for Hybrid Public Money to your Congressional Representative and Senators today!

For more details on these and other extensions of the EPM concept, see the materials provided at monetaryreform-taskforce.net. Opportunities for individual action may be found there as well.

APPENDIX: EXTENSIONS OF THE QUANTITY THEORY OF MONEY

The fundamental money exchange equation (presented first by Professor Irving Fisher of Yale University) states that **MV= PY** where M = money supply, V = money velocity, P = consumer price index, and Y = real GDP. The left side of the equation is the total money received in all transactions in the economy, and the right had side (PY) is the nominal GDP for the economy. So real output

Y = GDP/P where P is sometimes referred to as the GDP implicit deflator or inflation indicator variable. Since the amount spent and the amount received is the same in each individual transaction, the totals across the economy must be the same also.

Modern economists have pointed out, however, that the right hand side of the equation is incomplete, leaving out all the non-GNP related expenditures having mainly to do with financial asset acquisitions like buying a CD, stocks, bonds, and mutual fund positions. These are all financial transactions that are included on the left hand side of the equation, but are missing from the right hand side. To rectify this situation, one can simply add on a term that represents the totality of non-GDP transactions which we call Ya. Hence the corrected tautology becomes MV = PY + Ya where the "a" subscript stands for financial asset related transactions, including all non-GDP transactions.

For the analysis that follows, it is desirable to change this additive correction into a multiplicative one. Hence we define a "fudge factor" K = (PY+Ya)/PY so that the tautology becomes **MV=KPY** where "K" is the scale factor (bigger than 1) that increases PY until it just equals PY+Ya. For example, if PY and Ya were the same value, then K would be 2.

Some authors have characterized this equation (or its incorrect predecessor) as being static without realizing that the year time frame is actually a sliding window of time so that in fact all five of the included variables vary over time. One can emphasize this fact by making each variable a function of time, in which case the equation becomes M(t)V(t)=K(t)P(t)Y(t).

Taking natural logarithms converts products into sums, so one has

$$\ln(M(t)) + \ln(V(t)) = \ln(K(t)) + \ln(P(t)) + \ln(Y(t)).$$

Then differentiating each term with respect to time one has

$$(\dot{M}/M) + (\dot{V}/V) = (\dot{K}/K) + (\dot{P}/P) + (\dot{Y}/Y)$$

where the dot over the numerator of each ratio indicates the time derivative of the quantity in the denominator of each ratio. Each is a relative rate of change for each variable, and by multiplying by 100, each term becomes the percentage rate of change in each variable. Hence we define

$$m = 100\dot{M}/M \qquad v = 100\dot{V}/V \qquad k = 100\dot{K}/K \qquad p = 100\dot{P}/P \qquad y = 100\dot{Y}/Y$$

In this case the dynamic money exchange equation becomes **m + v = k + p + y**. It is quite convenient for analysis that this equation takes a linear form, and is stated in terms of percentage rates of change for each variable. From this simple equation, the inflation prevention inequality follows from the following elementary algebraic manipulations. Suppose the chosen tolerable rate of inflation, which we call the inflation tolerance, is I_0 (currently 2% although stable prices would imply 0%). Since p is the inflation rate in percentage terms, the government would have to control the money supply to grow in such a way that $p = m + v - k - y \le I_0$ or isolating m on the left hand side, we must have

$$\mathbf{m \le k + y - v + I_0}\,.$$

We call this the new INFLATION PREVENTION INEQUALITY (IPI) since it gives an upper bound on money supply growth rate that can be allowed without precipitating an inflation more than the inflation tolerance I_0. In the future, it is this relationship (concurrently with other dynamic macroeconomic models) that can be used to prevent inflation under debt free sovereign money, issued without debt into the economy, rather than the disincentive of debit with interest obligation which is used to limit excessive monetary growth under debt based monetary systems such as the Federal Reserve System. With this inequality firmly in hand, the government can assume its money creation functions again without fear of inflation.

At this point any self-respecting monetary reformer is likely to utter an involuntary objection along the following lines. "Wait a second, if the banks create all the money, how can the government possibly control the monetary growth rate." Excellent point. Of course, if monetary based is not under control of government, and bank lending is not either, then the government is completely out of the picture and the country is left at the mercy of the banking fraternity. But suppose for a moment that reforms were put in place such as proposed here giving the government complete control of the creation of monetary base, including coins, paper money and electronic sovereign money (ESM). For the purposes of this discussion, we shall take M2 as the measure of the money supply, although other choices are possible. The analysis is the same in each case. We use MB as the symbol for monetary base, and M2M as the M2 money multiplier, a quantity determined by the commercial banks based on how much excess reserves they hold. We then have

$$M2 = MB * M2M, \text{ so } \ln(M2) = \ln(MB) + \ln(M2M) \text{ and } m2 = mb + m2m.$$

Here MB is controlled by the government and M2M is controlled by the aggregate of the commercial banking industry. The lower case letters indicate the percentage growth rate of the corresponding variable in capital letters. The good news is that historically, the plot of M2M over time has been very smooth and continuous so that accurate estimates of M2M and its first time derivative (using spline fits for example) are easily determined to high degree of accuracy. This being the case, we can substitute mb + m2m in for m in the IPI to get

$$mb \le k + y - v - m2m + I_0$$

This gives an upper bound on the monetary base growth rate (which government controls) in terms of a number of other growth rates that it does not control. The fact that the government does not control the terms on the right side (except for the tolerance parameter) does not render the inequality useless. All that is required is that the data be available to estimate the growth rates on the right hand side, and this can be done.

A NEW STANDFARD FOR MONEY

In order to impose a zero tolerance on inflation (CPI constant and $I_0 = 0$) under conditions of unchanging monetary velocity and constant K and constant M2M, the IPI reduces to $m \leq y$, which says that the money supply growth rate should not exceed the growth rate of the real output of the economy. From this, one is led to see that the real and true backing for the money in an economy is the real output of the economy itself, taken in an aggregative sense, not based on any one or select few outputs like gold, silver, platinum and the like. The real output of the economy includes ALL GOODS AND SERVICES produced and sold in an economy, and it is this total measure of production (evaluated in constant dollars) that serves as the basis for or the backing of the money supply. Hence the value of the money is based not on what can be obtained in precious metals when turned in at the Treasury Department, rather it is based on what can be bought in the open market with those dollars or whatever the unit might be, that is by its purchasing power. The dollars spent at the grocery store are backed by the grocery bag taken home. The dollars spent on electronic equipment are backed by the very electronics that are purchased. The dollars spent on a haircut are backed by the improved appearance of one's hair resulting from the cut. And so on including all the transactions made everywhere throughout the economy. So when you sum it all up, you get the new

REAL OUTPUT STANDARD FOR MONEY

THE BACKING FOR MONEY IS THE AGGREGATE OF ALL GOODS AND SERVICES PRODUCED AND SOLD THROUGHOUT THE ENTIRE ECONOMY, that is to say, BY THE REAL OUTPUT OF THE ECONOMY. UNDER CONDITIONS OF CONSTANT MONETARY VELOCITY AND CONSTANT K FACTOR, STABLE PRICES ARE MAINTAINED BY INSURING THAT THE MONETARY GROWTH RATE EQUALS THE REAL OUTPUT GROWTH RATE. IF MONETARY VELOCITY or K IS CHANGING OVER TIME, STABLE PRICES ARE MAINTAINED BY OBSERVING THE NEW INFLATION PREVENTION INEQUALITY.

It is this new standard for money, together with the IPI, that makes it feasible to restore to the government its money creation role at this time as never before. This money creation function was usurped from government by the private banking industry in 1913 and has been in private hands for over 100 years. It is time now for the government to assert its powers to create debt-free interest-free money in substantial quantities with commensurate decreases in its borrowing activity using US Bonds and carefully planned increases in reserve requirements. By doing so, it can save trillions of dollars in unnecessary debt while pumping inflation-proofed dollars into infrastructure, clean energy, and education programs that will spur growth rates to double present levels while bringing unemployment down to half their present levels. As predicted by the London Times, we will enter a new era of inflation-free economic expansion that will have no end, unless we foolishly let the banks privatize the money creation function again as they did before.

This understanding of what actually backs the fiat money created by the government (i.e. real economic output) enables us to discover two more ways in which EPM can be injected into the economy in an inflation free way: (1) growth dividends that accommodate the natural growth of the economy, and (2) proactive GDP boosting investments that will cause GDP to grow faster than without them. In the first

case, this is analogous to providing new blood to a living baby as it grows into adulthood, since the volume of blood needed by an adult is greater than that needed by a baby. The body generates this new blood automatically, and the parents do not have to pay anyone anything for the new blood to be created. It happens naturally. It should be the same for an economy. When it grows naturally due to increases in population, technology, productivity, and innovation, the new money to support the increased volume of transactions should be provided automatically by the government in a debt free way and in proper proportion so that inflation does not occur. This is now possible thanks to the Inflation Prevention Inequality. But we can go another step forward by making a "rational expectations" extension of the inequality, to take into account the increase in growth rate that occurs if the new money is specifically targeted at infrastructure and energy technology. In this case, the backing for the new money comes into existence as a result of the expenditure, and at the end of the day the increased economic activity comes about without any significant inflationary impact. This makes government EPM investments in all sorts of GDP boosting projects possible without fear of inflation. And as a double check, the Monetary Creation and Control Authority will be in place to total up the expenditures and estimate the GDP impacts. By limiting total EPM creation, and/or raising the reserve requirements on commercial banks, it can, using advanced NASA style optimal control algorithms and dynamic system forecasting models, effectively prevent excessive inflation from occurring.