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Martin Shubik

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**SIMECS, ITHACA HOURS, BERKSHARES,
BITCOINS AND WALMARTS**

By

Martin Shubik

May 2014

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Martin Shubik

April 21 2014

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Abstract

The practical and theoretical meaning of the rise and fall of new local and virtual currencies suggest that two basic theories of money both have their validity and reasons for coexistence. The drive for increasing efficiency in the payment mechanisms is in full swing and still presents many opportunities for improvement.

Key words: Money, fiat, virtual currencies
JEL Classification E41, E42, D23

1 The Practice and Theory of Money

These are turbulent times in Central Banking and in the guidance, coordination and control of the over 200 official fiat monies and the essentially uncountable number of near-monies, virtual monies and money substitutes that exist, have existed and will continue to proliferate.

1.1 Transactions and money

At least since Commons [3] and the U.S. institutional economists of the 1930s the transaction has been regarded as a central unit of economic activity. Among the tax authorities empirical measures of transactions are involved in both sales and income taxes. In spite of the tidy analytical and mathematical appearance of transactions in static and comparative dynamic economic theory, when one is confronted with the institutional realities of a functioning economy at both the microeconomic and macroeconomic levels the simplicity of what is a transaction goes away. The true nature of the economy as a constantly changing evolving biological organism emerges. At its simplest a transaction is an exchange of goods or services between two individuals in the context of a societal system providing implicit or explicit contract compliance. The amazing process difficulties in translating these simple words into a practical working system are soon grasped by looking at any basic legal text on payment systems (See for example Gilette, Schwartz, Scott [6]).

The standard textbook description of money even to this day is given by its three important properties as a

- (1) means of exchange
- (2) store of value and
- (3) numeraire.

A money of some variety is almost always involved in a transaction. But the simplicity of what is a money vanishes in practice. thus in the United States the money supply is given by a vector composed of a dozen different instruments.

In this essay a brief sketch is given of a few of the institutional aspects of money; the brave new world of virtual monies is considered; and some of surprising features of a functional approach to monetary theory suggest its implications for the development for the world's payment systems.

1.2 The material and rules of money

The textbooks may teach us that the first coinage appeared in the West some time before 500BC in Lydia with the forbearers of Croesus introducing it in Lydia [16]; The

Chinese appear to have introduced it independently [13], but before and after these dates the means of payment have been supplied by other physical objects including barley, and metals such as gold, silver, copper, bronze and platinum, coined or by weight; cowrie shells, beaver pelts, wampum, cocoa beans and even cigarettes, and playing cards each adjusting to the time and context. Yet the relevance of the aspects of the physical entity can easily be misleading. The tangible transfer of ownership of some physical object may obviate the need for considerable record keeping.

It appears that the needs for the making of payments through space and time called for the development of contracts and financial instruments of far more sophistication than money well before coinage. The archeology of trade in Sumeria, [16], Babylonia [7] and China [13] provide the evidence.

With the growth of the modern nation state and its political power and in the seventeenth and eighteenth centuries [1], [10] the government bureaucracy, record keeping and enforcement mechanisms along with formal accounting [12] and mathematics, the stage was set for governments to impose on their societies an official fiat money with its production limited to itself or its agents. Government and law even at their most powerful are part of society and do not obliterate custom.

The heavily enforced injunction against the production of the fiat money of the state is not the same as an injunction against any group inventing and using their own money. The question of what is a money is one of function, not form. The state may appear as a monolith, but with respect to monies and near monies it is *primus inter pares* and not the supreme ruler.

1.3 Simecs, Ithaca Hours, and Berkshares

An object or symbol has a critical property of a money if it serves as a means of payment among a set of individuals. The set does not have to constitute everyone in a nation state. It may be limited to a small subset. Over the centuries there have been hundreds, if not thousands of individually generated currencies. Three fairly recent examples noted are the Simecs [11] from a town in Italy; Ithaca Hours

in Ithaca and the Berkshare, in the Berkshires around Stockbridge (<http://www.berkshares.org/>). Possibly the most interesting of the three is The simec. It gave employment and enjoyment to Giacinto Auriti a retired law professor who issued Simecs in year 2000 as a currency in his home town of Guardiagrele. The Italian financial police impounded some of his simecs and he won the court case in Cheiti on the argument that printing of one's own money was not tantamount to counterfeiting the national currency. Auriti died in 2006, but his currency predeceased him.

Ithaca Hours were started by Paul Glover in 1991, evidently inspired by the note issued by Robert Owen to his worker based on an hour of labor. The notes were accepted and circulated in some stores in Ithaca and were given in exchange for labor. By 2011 according to a local publication [9] only a few were still in circulation. The objective had been to stimulate trade in the local economy in a socially and

ecologically responsible manner?

The Berkshare was first launched in September 2006 with the goal of stimulating the local economy and encouraging local trade. According to Berkshares, Inc.:

BerkShares are a local currency designed for use in the Berkshire region of Massachusetts and issued by BerkShares, Inc., a non-profit organization working in collaboration with participating local banks, businesses, and non-profit organizations.

The exchange rate of the Berkshare is fixed at 95 cents of a U.S. Dollar, thus one might regard it as local five percent discount device. As of an interview in 2013 [15, How to Print Dollars in Your Own Backyard and Keep Them Away from Wal-Mart] there were around 130,000 Berkshares in circulation, which is a financial drop in the bucket, but with its organizational structure with Berkshares Inc. it still thrives as a small hardy perennial.

Many monies have thrived on local information, trust and power in company towns. Merchant bankers emerge from merchants with a reputation for trust. Wal-marts provides the latest example. But in spite of the dreams of glory of Professor Auriti the local currency generators have been for local regions and/or special circumstances to satisfy modest needs such as those generated in prisoner of war or concentration camps or in cities under siege. When we move closer to the world of 2010–2030 quaint minor size paradoxes turn into new problems involving billions and potentially trillions in payments. All of the examples above involved physical representations of means of payment, but that is hardly what the ever growing more abstract payment system is about.

Before considering the electronic world and virtual means of payment a brief digression is taken into an abstract deconstruction of some of the central problems of the properties of a means of payment.

2 The Properties of a Means of Payment

Prior to discussing the elemental properties of a means of payment an important and often misunderstood distinction must be made.

2.1 The processes of exchange contracting and settlement of trade

The processes of exchange contracting and settlement are highly interlinked but are basically different and only coincide when both involve masses of small independent agents acting in parallel. In such instances we may ask what basic properties of the exchange and payments network should be considered.

2.1.1 Reasonable properties of trade and payments mechanisms

A micro mechanism approach to the role of money and markets recently presented by Dubey, Sahi and Shubik [5] has stressed the implicit goals of mass trading and settlement systems in trying to minimize complexity in the mechanics of trade.

Conditions that appear to be desiderata of efficient trading and payment systems are noted below:

In keeping with the current methods of modern mathematical economics since the 1940s they utilized an axiomatic approach in investigating the properties of an economic system and by proposing five basic assumptions concerning trade and payment were able to show the emergence of markets and a money from basic mechanism considerations regardless of the nature of the preferences.

The five properties or axioms of trade that drive the results are noted below. They are (a) anonymity; (b) aggregation; (c) invariance; (d) non-dissipation and (e) flexibility.

Anonymity The meaning of **anonymity** is that the mechanism takes into account no other features of the individual than the individual's messages. Equal messages will always evoke the same response.

Aggregation The meaning of **aggregation** is that if any trader pretends to be multiple players and trades under several different names this does not influence his returns. In oligopolistic markets this is false, but in large anonymous thick markets this is a reasonable approximation. Wash sales and trading under many identities are not worth the effort in a thick market.

Invariance The third condition is **invariance**. It states that the physical results are totally invariant under any changes in the unit measurements of the items traded. The names of units do not matter.

Non-dissipation The fourth condition of **non-dissipation** simply states that the total array of commodities is the same before and after trade. They are in different hands, but no resource losses have taken place.

Flexibility The fifth condition is **flexibility**. It states that an exchange system should enable traders to avoid having commodities bundled together. If one wishes to obtain only item B one should not be forced eventually to accept quantities of C and D bundled in with it.

2.1.2 Trading time and complexity

Along with a further two conditions on minimizing the length of time and a criterion on the informational complexity of trade these properties are sufficient to establish the existence of mass markets and prices more or less as we know them and to indicate the basic need in any economy for a single basic means of payment. This is not the appropriate essay in which to go into the technical mathematical details required to establish these results, They are all available in detail in the publication noted [5]; but the important feature is that the obtaining of these results requires no more than these few elemental properties of a good trading system. Markets, prices and the pressure for the emergence of a single money are all implicit in these few conditions of trade and payment

2.1.3 What has this got to do with brave new world of finance?

Economic trade exchange and settlement is a dynamic network phenomenon. Any network or subnetwork of individuals who develop a common identity, or join the club will evolve some form of markets and means of payment. The concept of a “money as good for all debts public and private”, must be taken in the context of the network to which it applies. U.S. dollars are not good for all debts public and private in Switzerland. In order to be used in payment there, they require the appropriate haircuts and contractual agreements.

2.1.4 Transactional reality, power and network

The economic world as we know it has a host of uncomfortable details that are here to stay for some time. The oligopolistic structure of many markets limits market function and separates the methods of bargaining and contracting from the techniques of settlement. The existence of local area economic and social nets, the presence of special affiliation groups allow for the simultaneous coexistence of many economic nets of different sizes and powers. Each may strive for its own markets and money. Quantitative differences enable qualitative differences to appear. The Federal Government of the United states is the only economic institution that is known to all of its inhabitants and it has by far the largest bureaucracy and enforcement system of all economic institutions. This provides a basis for it being able to enforce special rules concerning the size control and acceptance of its money; but this does not rule out the potential for the emergence of other monies in subsystems. As the subsystems and the overall system are all linked in various degrees there is no equilibrium in the system. Arbitrage opportunities will always exist as the very concept of money is a dynamic phenomenon and any active money is only kept afloat by its dynamics. The dollar may exist in some manifestation over centuries, but the Berkshares, Ithaca Hours and other local currencies will come and go. The underlying socioeconomic pressures like a general economic gravitational force are nevertheless present and the

slow economic pull is towards a single world currency. Whether it ever gets there, or how long will it take is determined by the bureaucratic and political forces that act against the individual economic agent.(See for example [1], [10]).

2.1.5 Money and language

Both money and language are phenomena associated with dynamics, communication and evolution. The functioning of money, financial instruments and markets is less complex than human languages, but it provides a language for economic life that reflects the dynamics of the society to which the economy has to adjust constantly.

2.2 Electronic and virtual means of payment

Much of the discussion above has been devoted to the fast disappearing slice of physical reality where items such as banknotes and coin made up a substantial segment of payments. In fact instruments such as the bill of exchange and the check have born the brunt for many years until with the computer and network revolution after World War II the payment system under went a sea change that is continuing today

Electronic Means of payments such credit cards, debit cards, American Express, Visa, MasterCard, Paypal and others have appeared and the structure of payments in many countries is changing as is indicated in publications such as the Federal Reserve Bulletin, the International Monetary Fund and the statistics from the Bank for International settlement.

The growth of special means of payment such as Blue Chips or Airline Miles and a vast array of discount coupons have helped to create market and laws that help to enable individuals who do not use them personally to cash in at varying discounts for “real” government money.

The growth of E-bay, Facebook and other social nets have provided the means for special markets to enter, and exit with a minimum of formal organization.

An epitome of the abstraction of a candidate for a money in modern times has been offered by the virtual money Bitcoin where the issue of Bitcoins is controlled not by any government or private issuers, but by Bitcoin miners laboring in the mines where the miners are no longer semi-literates down some sweltering goldmine shaft in South Africa, but are PhDs seated with massive computer arrays in Iceland because cooling for the computers is cheap. The “miners” are solving increasingly hard mathematical problems in order to extract packages of Bitcoins from a perspectives upper bound of 21,000,000 available to be issued. The work to mine a Bitcoin involves a considerable expenditure of resources, not unlike the expenditures in goldmining, but the yield in one is a purely symbolic record in an encrypted account, while in the other it is a physical good. The former has no intrinsic value beyond that which could be created if it were used as a means of payment, while the latter has some direct use industrially or as jewelry but its value would be considerably enhanced if it were used as a money.

A recent publication by Edward Castronova [2, Castronova, E., 2014. Wildcat Currency. New Haven: Yale University Press.] is devoted to the study of virtual monies and, in part, with them virtual games and virtual commodities. One has examples of computer games utilizing virtual monies to buy virtual goods and virtual social and political power goods in computer games where actual markets come into existence to enable players who are rich in virtual currency to sell their virtual currency to other players in exchange for fiat money as is evinced in the game Diablo III or EVE on line [2] (p. 20). The markets for the virtual dollars of a game against the US dollar when two players of the same game wish to exchange virtual game power for US money may not amount to more than 100 or 200 million a year (see [2]) but it is indicative of the many “oddball possibilities” with computer net monies.

3 Two Views of Money: Libertarian and Statist

There are two basic views of money and in different ways both of them are true. The first is based on the natural individualistic needs for trade and the second is based on the powers of the state and the needs for the rules of the game to provide commercial codes, weights and measures, enforcement of the accounting conventions, the laws of contract and bankruptcy and the provision of legal enforcement against illegitimate force, fraud and theft.

The first concentrates on the basic needs of all individuals for smooth, efficient overall trade and settlement; the second advocates the use of the power of the state to provide the conditions that enable a money to become universal in the context of the state.

Adam Smith both recognized the resource needs of government and offered four fundamental observations on the principles of taxation

- The subjects of every state ought to contribute towards the support of the government, as nearly as possible, in proportion to their respective abilities... [14, There is no art which one government sooner learns of another than that of draining money from the pockets of the people.]
- The tax which each individual is bound to pay ought to be certain, and not arbitrary. The time of payment, the manner of payment, the quantity to be paid, ought all to be clear and plain to the contributor, and to every other person... (Book V Chapter II Pt II)
- Every tax ought to be levied at the time, or in the manner, in which it is most likely to be convenient for the contributor to pay.
- Every tax ought to be so contrived as both to take out and to keep out of the pockets of the people as little as possible, over and above what it brings into the

public treasury of the state. . . [14, The Wealth Of Nations, Book V Chapter II Pt II, p. 826, para. 6.]

What was obviously not set out in Smith was what constitutes an optimal level of taxation sufficient to do more than to pay to provide the many rules for the functioning and supervision of free markets. This is a question for which there is no economic answer, but its answering and reformulation by every generation is part of the sociopolitical process.

3.1 The paradox of rules and competition

A major exchange such as the New York Stock Exchange is often held up as an example of the functioning of a near ideal competitive market, yet when one looks at the volumes written on the rules of the exchange and the law cases on their interpretation they fill a substantial part of a law library. Unbiased freedom of exchange requires many rules, much disclosure and supervision. At its best this is costly to supply.

3.2 Big brother and anonymity

Anonymity in one context is not anonymity in another context. The computer age brings with it not merely new possibilities for freedom but for governmental control. The tracing of money flows¹ is high on the list of means to trace individual activity. But the money flows are usually credit instruments with names attached. Cash payments may be made, but they are both harder to make and far harder to trace. The theft of credit card numbers provides an added incentive for maintaining the use of cash. As technology improves it becomes easier for A to make a payment to B with no third party interference and even though evidence of the transfer is available, the identities of neither party is known.

3.3 New Network Currencies?

A current rage in 2014 is an individual currency called Bitcoin. It comes with the attendant science fiction hype of a mystery Japanese super-programmer, mystical and unbreakable codes and the promise of a libertarian's dream. The ultimate denial of interference by any government in individual economic affairs.

A fundamental difference between the Bitcoin and the previous currencies is that it may be considered as a high tech computerized attempt to aim for the globe, as contrasted with the others that have been heavily local.

Bitcoin removed the need for a third party to act as referee over the whole system by publicly distributing the information to all members of the net. All transactions, but not the names of transactors are broadcast to all.

¹See the Where's George? website for a passtime in tracking the travels of dollar bills.

Bitcoin must be distinguished from noncomputer individually or grassroots generated private currency.

The basic problems with and opportunities for Bitcoin are based on subtle points in the theory of money and unsubtle points in the economic reality of world trade, law and sovereignty. An important danger is that Bitcoin provides a natural device for illegal trade in drugs, weapons, tax evasion and other aspects of an underworld economy. However could it provide a socially useful service? World Gross Product in terms of a United States dollar has been estimated (by *IBIS World* <http://clients.ibisworld.com>) for the year 2014 at \$58.3 trillion and world trade at \$24.2 trillion. Foreign exchange global trade in 2013 (2013 Triennial Central Bank Survey, BIS) was estimated at \$5.3 trillion per day. This essentially reduces all currencies to one for payment purposes. Numbers such as these are fun to play with and to utilize, more in metaphor than measurement. They are constructs that help us phrase and rephrase questions that are hard to nail down. These numbers suggest that if we were to guesstimate the overall size of illegal world trade as anywhere between 0.5–5% of world legitimate trade, a virtually anonymous computerized transfer system could profit considerably on illegal trade alone. It could be regarded as an improvement of the glorified Hawala traditional Islamic payment system that was supported in part by the power of custom and the scattering of users with the same traditions to enable it to provide a global payment system. But as big as this may be, it is the bigger prize that is coming into sight. They are the gains to be had in the improvements in the legitimate payment systems of the world economy.

The current buying selling and final settlement system absorbs somewhere between 2–4% of world International product. This depends heavily on how the figures are made up. How many lawyers, accountants, auditors, insurers, bookkeepers IT and other bureaucratic and supervisory personnel are included in the system?

4 Global Forces and Local Restrictions

In the dynamics of trading and settlement different global and local forces have appeared and will continue to be there as long as the economies seek new methods products, methods and measurements

4.1 On macro- and microeconomics

Can macro and micro theories of money offer much practical assistance to the world we face?

Macro-economic monetary theory is designed do work directly with institutions and institutional practice as it is together with the current body of law in existing societies.

One of great open problems in economic theory consciously recognized since Austrian School has been a micro theory of money. There has been a basic gap between

macro- and micro- economics for many years. It has been important and has grown considerably since the 1930s and enormously after WW11 combined with a world exploding population and the great financial revolution that is taking place fueled by communication and computation technology and the study of economic theory and finance.

The Arrow, Debreu, McKenzie development of Walras' great work on competitive markets reaches such a Platonic timeless institution-free level that money is not needed. It is replaced by an accounting virtual money at best that is automatically used to verify all accounts in the one great perfect clearing house in the sky.

In their different ways Keynes, Klein, Tobin and many large macro-system builders mixed their portrayal of the General Equilibrium system with the existence of money and financial institutions introduced in an ad hoc manner.

The argument here is that much of the difficulties with a theory of money did not matter very much in pre World War world where borders and jurisdiction were far less pervious to information than now and where next to no markets or payment systems could approach anywhere near the ideals that are now approachable.

4.2 Personal trade, mass markets and mass settlement

The natural emergence of markets, prices and a single money is an implication of an ideal friction free economic environment. A good approximation of this environment is reached for many mass markets in fungibles. The stock and FX markets are natural examples. But in a world with the need for commercial and tax codes, and where innovation expands and complicates choice and where perception is expanding the depth of vision the local forces are in constant motion against the single money and globally consistent price system.

The markets for nonstandard derivatives, for corporations, rare art, major government contracts, land, houses, arms shipments and drug trades are not anonymous to the major principals; if anything because they cannot depend on the services of the local jurisdictions they will be loaded with lawyers, accountants and financial and physical evaluators, and in some instances, even with their own enforcement apparatus.

The corporate world and international trade are rife with oligopolistic structures and have no choice but to generate one on one connections with various bureaucracies. Thus in spite of an overall pressure to the seeking for and emergence of a single money and an efficient market structure the counterforces determine the every day arena and the *as hoc* problems at hand.

In particular for much of the economy exchange contracts are still handtailored and even if it is primarily the lawyers, they are still face-to-face. The seamless connection of contract and settlement is, for the most part, not there. The costs are heavily with the contracting, but the possibilities in reducing the costs of methods of settlement have grown considerably with the growth of technology and new monies

such as Bitcoins serve as examples.

4.2.1 Software and hardware nets: A lesson from Walmarts

A recent development in transfer banking has taken place with Walmarts. It has around 10,000 brick and mortar establishments around the world. It has a reasonably faithful lower and middle class clientele with many relatives elsewhere. its entry into the money transfer banking business captures great hidden assets, provides a basic public service in a high transactions fee business and can easily conform to all laws with respect to information disclosure and regulation. The computer net has offered a new way to cash in on both reputation and bricks and mortar

5 Conclusions

Concerning its availability by the world community whether Bitcoin per se survives is of little concern to others than investors and supporters of Bitcoin. The key messages are that large changes in the role of settlement technology may be in the offing, less so with the contracting and transactions technology. The markets of credit cards, debit cards, American Express, Visa, MasterCard, Paypal and others are where legitimate large profits are to be made from socially valuable improvements.

The message is clear. Given the various improvements that must and will come from schemes such as Bitcoin they must be made consistent with government concerns for tax evasion and illegal trade. The price for realizing these gains is to modify the libertarian dreams and to work out the appropriate accommodations with all states involved that still enables new schemes for payment to improve the economy as a whole while conforming with the legitimate requirements of the state for taxation and the policing of illegal activities.

Good practice and good theory will and should remain apart, but they should never be far from each other. The new world of the electronic means of payment forces us to realize that the two theories of money encompassing both custom and the evolution of trade with law and the legitimate power of organized society are both consistent and necessary as the future history of some LegitCoin will show; and an example such as Walmart shows that a net of trust can be built with people and bricks and mortar used for other purposes.

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