Currency of the net - e-Money: Potential Untapped

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Abstract:

The paper aims to unravel the future implications of digitized money, i.e. e-Money. The Internet revolution has not left the financial sector untouched. e-Money shall be its fallout. The paper explores the impact of e-Money envisaged on businesses and monetary transactions as a whole. The infinite time divisibility of currency on the net shall help e-Money acquire a truly universal character and shall make it the driver of the global e- economy. This would also considerably affect the control functions of the Central Banks.

Keywords: Barter System, e-Money, interest rates, time divisibility of money, universal currency, money multiplier, high-powered money.

World in the pre Christ era… goods and services were exchanged for other goods and services, e.g. you could exchange milk, food grains like rice, wheat etc. for other food grains, cattle for other necessary commodities. That was the Barter System. It remained a mode of economic transaction for centuries.

As time passed by, with increase the living standard and evolution of different processes, multiplicity of goods produced and increased comfort requirements; it became imperative to device an effective method for quantifying transactions. Everyone wanted to quantify even the smallest transactions that would not have been possible with the Barter system. Hence, came the currencies… each sovereign state issued its own currency to standardize the transactions happening in its domain, though the inter state transactions still used to happen through the age-old barter system.

Again, in the last century with the information revolution and era of globalization, came the inter-convertibility of currency — earlier, purely based on the political supremacy of the state, and subsequently on the basis of economic conditions and outlook — everything controlled through the central bank of the country. Thus, evolved the financial systems what we see today. To add to that, simultaneously evolved other financial instruments viz. the different exchanges — the stock exchanges, metal exchanges, banks, financial institutions etc. Thus, Money became the prime mover of the economy; it changed hands through one transaction followed by another and replaced the traditional Barter System.

World in new millennium – another paradigm shift in the way transactions are being done; the Internet has changed it all. Once again the Barter system is getting popularized, being reinterpreted from its traditional definition of exchange of commodities into an economy of its own representing a definable group of manufacturers, service providers, retailers, consumers and professionals who, by supplying one another with their operating needs, also contribute to one another's profits.

Through the use of computers, exchanges can officially match the needs and wants of their clients. They use a medium of exchange, the e-Money. Each time a client makes a trade purchase, the exchange debits the buyer's account and credits the seller's with the e-Money, similar to an ordinary bank account.

Next great leap of the e-Era – the digitized money – e-Money is going to hit each one of us in the wallet. Those Rupee, Dollar and other currency bills are headed toward cryptographically sealed digital streams of bits and bytes, stored on a microchip-loaded "smart card", or a palm-sized "electronic wallet" connected to the wired world through the latest wireless technologies.

Let us elaborate some of the facts and extend our imaginations into this new paradigm.

So what exactly is e-Money?

Simply put, e-Money is the digitized money. e-Money or Digital Cash is the representation of money, as we know in physical form today, in electronic data-form within the global economy. It works the same way as existing monetary economies except that it is represented as computer data. It is made possible through a system of Public-key cryptography and digital signatures. Banks and customers would have public-key encryption keys. Public-key encryption keys come in pairs. A private key known only to the owner, and a public key, made available to everyone. Whatever the private key encrypts, the public key can decrypt, and vice versa. Banks and customers use their keys to encrypt (for security) and (for identification) sign blocks of digital data that represent money orders. A bank "signs" money orders using its private key and customers verify the signed money orders using the bank's widely published public key. Customers sign deposits and withdraw using their private key and the bank uses the customer's public key to verify the signed withdraws and deposits.

In general, there are two distinct types of e-Money: Identified e-Money and anonymous e-Money (also known as digital cash). Identified e-Money contains information revealing the identity of the person who originally withdrew the money from the bank. Also, in much the same manner as credit cards, Identified e-Money enables the bank to track the money as it moves through the economy. Anonymous e-Money works just like real paper cash. Once anonymous e-Money is withdrawn from an account, it can be spent or given away without leaving a transaction trail

Again, each of this type of e-Money has two varieties: online e-Money and offline e-Money. Online means one needs to interact with a bank to conduct a transaction with a third party. Offline means he/she can conduct a transaction without having to directly involve a bank. The offline anonymous e-Money (the true digital cash) is the most complex form of e-Money because of the multiple-spending problem.

A piece of e-Money is very easy to duplicate. As the copy is indistinguishable from the original, one could become a millionaire in a few minutes. A trivial e-Money system would allow a person to copy a piece of e-Money and spend the copies, too. But, Obviously, real e-Money systems must be able to prevent this multiple spending.

New Insights: e-Money - the new paradigm

Disregarding the security issues, which surely, will be taken care of in the near future, let us analyze the long-term implications of the e-Money.

Consider, a person having just got his monthly salary in the digitized form, spends it on certain necessities like food, clothing. He just logs into his favourite shopping mall and orders the goods; transfers the e-Money from his account to that of the mall and before reaching home, gets the goods delivered at his home.

And his savings? Here is the most important aspect of the e-Money transactions, which are going to revolutionize the financial markets. The person transfers the money into his e-Bank Account, and starts earning interest for every second for which the money is parked into the bank. Consider the implications of this true granularity of money in the larger perspective of the world trade where billions of dollars get exchanged, where even an interest rate of say, 10% annually on a sum of $100 bn would amount to an interest of more than $300 per second or more than $1 mn per hour. Add to that the number of interest hours, which are lost because of the traditional banks' scheduled timings and one will realize the inefficiency of the present system.

Consider another aspect: the speed of e-Money transactions will revolutionize the businesses. Let us illustrate with an example. Take a traditional loan-processing scenario, where in, a Construction firm takes a bank loan. It will require say five days to get a sanction and appoint a contractor, another 30 days to build a flat or a shop and sell it off to make more money. Thus, the average turnover time for it to earn, say, 10 % Return on Investment (ROI) would be 35-50 days.

Now, consider a DOT COM contractor – he takes an e-Bank loan for a short term, say 20 hrs; sets up an e-trading mart in a matter of minutes on the Internet, another few minutes to rope in an e-CRM provider and a customer database provider; globally markets, say, handicraft products to 40 million customers and makes a sell to 1 million; and thus generates a ROI of, say, 1 % on his loan within 20 hours and gives away an interest of 0.50 % to his e-Bank. Amazing!! And in all the above transactions, the medium of exchange is definitely going to be e-Money.

With possibilities of such transactions through e-Money highly likely in near future, and the instantaneous transferability of e-Money, the way businesses will run is going to change phenomenally. In fact, the changes have already started, with some of the auction/games sites using their own e-currencies, which can be encashed at some e-mall.

Of course, the interest rates or the price of the e-Money is going to change according to the time-divisibility, and it is largely going to be regulated through the conventional demand – supply economic model of the e-Money. Let us elaborate a little more on this aspect.

As we all know, the interest rates in an economy depend on five factors, which may be incorporated into the following equation:

$$r = r_i + r_d + r_m + r_l + r_r$$

i.e. the interest rates depend on what the lender expects the *inflation* to be (r_i); the *default* premium (r_d) charged to cover the additional risk, if the debts would not be repaid; the risk due to the length of time of the loan i.e. the *maturity risk* (r_m); the ease with which the loan can be turned into cash – the *liquidity risk* (r_l) and of course, the risk free, *real rate of interest* **(r_r).** The above rates will vary according to the type of loan, duration and risks involved.

Now, in the example illustrated above, in the case of the DOT COM venture, the nominal interest rate r will comprise of all except the rate of inflation (r_i), which will be negligible for such a short period of time. In fact, once the present e-systems stabilize, the default premium risks (r_d), which at present are quite high for such ventures (because of no reliable revenue models and methods of valuation of such businesses) would also diminish. These are some of the areas, which still need to be looked in more detail, but surely the reader must have got a little insight of what is to come in the near future.

Implications of e-Money:

I have touched some of the aspects of the future of e-Money. With the use of e-Money becoming popular, the present banking functions are going to change completely. In fact, banks in the present sense may not even exist in future. They have to continuously evolve into new age financial solution providers by extending their services from the present traditional banking functions.

Clearly, e-Money is going to evolve into a truly universally acceptable currency in the 'not so distant' future. Though, I still don't know what its implications would be on the role of central banks, but, for sure, they too won't be isolated from the e-Money's impact. Perhaps, there would be only one global Central Bank of the like of IMF, regulating the policy issues regarding e-Money, with its branches in each of the different countries.

The money multiplier concept, too, will have to be modified. The e-money stock in public hands would be fully privatized i.e. it would be kept in the e-money exchanges (say, e-Banks, for simplicity), with the Central Bank serving only as a source of bank reserves. Traditionally, our monetary system has been one in which the money multiplier depends on two variables. These are (1) the public's currency-to-deposit ratio (cu) and (2) the bank's reserves-to-deposit ratio (r). The formula for the multiplier translating into $m = (1 + cu)/(r + cu)$, where the total money stock, M, is equal to mH, and H stands for the High-powered money or the monetary base.

The emergence of e-money strengthens the case for a strict monetary base rule by, in effect, helping to eliminate the currency-deposit ratio (cu) as a factor influencing the money multiplier. The multiplier would then simply be the reciprocal of the banking system's reserve-deposit ratio (r). The challenge of monetary control would be simplified accordingly: with one less variable to worry about. That at least would be true if e-money could completely take the place of the conventional paper currency.

Also, because of the infinite time divisibility on the net, the interest rates could be charged even for milli…micro…seconds! Thus, it would make the idle money almost an unthinkable phenomenon. In this regard, the infrastructure, definitely, is going to become a major bottleneck because, how fast your money gets transferred will depend on the speed of your communications backbone. Hence, the time divisibility would be accordingly restricted to may be, a few seconds, based on certain agreed upon international standards.

Conclusion:

The present paper has analyzed some of the key issues involving the e-Money, the currency of the future. How the e-Money would replace the present paper currency, the problems involved etc., will be some of the key issues, which need to be addressed before e-Money becomes a universally acceptable form of currency. In particular, persons who do not currently have bank accounts, and who cannot easily afford digital wallets, may need some encouragement to induce them to make do without paper currency.

Also, the high potential for fraud would greatly restrict the growth of e-Money as a universally acceptable currency. Given the frequency with which hackers penetrate supposedly secure computer networks, the reliability of the e-Money, as a secured currency will be the biggest challenge. But, with the comfort and convenience provided, and rapid advances in technology, e-Money would definitely evolve into a global currency.