THE POTENTIAL IMPACT OF DIGITAL CASH ON THE STABILITY OF EMERGING ECONOMIES

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Introduction

Economic stability, and as a result, growth in the economy of Trinidad and Tobago, depends on maintaining a relatively stable foreign exchange rate between the TT dollar and, say, the US dollar. Initially, this rate was fixed to Sterling then to the US dollar. The rate in the latter case was maintained independent of export/import performance by rationing the available foreign exchange, all of which was under the control of the Central Bank. The success of this monetary regime depended on the constraining effect of Trinidad and Tobago’s national borders. However, the new global economy demands market and financial liberalisation, and Trinidad and Tobago has followed suit. In April 1993, the exchange rate was floated after being set at a level with the US dollar that was thought reflected the performance of the economy. Further, other financial institutions besides the Central bank were allowed to deal in foreign exchange directly, and institutions and individuals were allowed to maintain locally and off shore foreign exchange accounts. This liberalisation also extended to the holding of foreign investment. Liberalisation made it a bit more difficult for the Central Bank to ‘control’ the exchange rate. Since most people still use the TT dollar as the main vehicle for trade, the financial liberalisation was partial. The Central Bank in theory supports the idea of a floating rate, which is set by supply and demand for foreign exchange. However, it is recognised that there are random variations in supply and demand, which, if left to their own devices, could cause high frequency fluctuations in the rate. These fluctuations are damped out by the Central bank’s governance in the market, which consists in general of controlling the liquidity of the TT dollar in the local market and trading foreign currency therein. The latter is facilitated by the fact that the Government is a substantial earner of foreign exchange via the energy sector. The Central bank regards the maintenance of the exchange rate to be of such high priority that it is willing to dry up the liquidity in the market, risking a reduction in capital investment and the crowding out of other players in the capital market. It has also been the practice of the commercial banks to promise to supply foreign exchange requests at dates in the future simply to relieve pressure on the rate. Clearly the main players in the market view the maintenance of a stable if
not precisely fixed rate as fundamental to economic development.

The New Economy

The emergence of the Internet in the world as a network that can connect almost every one that has access to a computer and at least a telephone line has sparked a dramatic change in, better a new direction for, commercial activity, one that will reduce the constraint of national borders. This is called electronic Commerce (e-commerce). In general e-commerce is about being able to select goods and services, order and pay for them online. Since a supplier in the USA, UK or France is simply a mouse click away, then the Internet can indeed make the market global: global in the sense that any Internet user can as easily in theory buy from and sell goods to any other user in any part of the world. If these goods can also be delivered on-line via the Internet (music, information, software etc.), then the transactions need no support from traditional delivery systems. The most fundamental aspect of on line business or e-commerce is the ability to pay for goods and services on-line or using the Internet. Hence, it is important to develop some kind of electronic money as part of an electronic payment system.

Electronic Payment System

There are many proposals for electronic payment systems on the Internet. One of the basic forms of payment is to send a credit card number along the Internet. This is fraught with problems. Note that credit cards predate the Internet trade and were not specifically designed for e-commerce. Credit card numbers can be intercepted by others because the Internet is an open system. In the real world (as opposed to the so-called cyber space of the Internet), fraud can be avoided by using cards only at trust worthy or familiar stores. In cyber space, even if trustworthy stores are used, the Internet can be tapped and credit card information can become available to unauthorised persons. Therefore, systems like encryption have to be put in place to help defeat fraud.

Credit cards can only be used in authorised establishments. This places some responsibility for merchant credibility on the banks and credit card suppliers (Visa etc.) In other words, credit cards cannot be used like cash for peer to peer payments, and are a limited vehicle for conducting business. Credit card payments usually incur a small fee. Though this is low it can be relatively large if for example, a credit card were to be used to purchase a $1.50 postage stamp. Hence credit cards cannot be used for micro payments on the net for say the use of an information service.

Receipts for credit card payments leave records of the users' expenditure. Hence credit card companies know what goods and service were bought, where and when. Credit card payments can be traced while cash payments cannot. One advantage of this audit trail of credit card transactions is that both supplier of goods on the Internet and the bank/supplier of the card can bear part of the responsibility for example, of non-delivery of goods after payment and even credit card fraud.

These problems have been addressed with some limited success. For example, First Virtual Holding began a payment system in which users send their password instead of credit card numbers, after having registered in advance with first Virtual Holding. After purchasing, the user receives a confirmation
e-mail asking if the purchase is valid or not. If the answer is in the affirmative then the payment is processed. VIA and Master Card have also introduced similar systems using encryption technology. FCB and Scotia Bank locally have taken the initial steps in establishing an Internet based credit card payment system. But these systems only address the security problem of the internet.

Conventional cheques are closer to cash than a credit card payment since peer to peer payments can be made. Hence, several proposals have been made to implement a digital cheque on the Internet, e.g., Cyber Cash, Digi Cash, Net Check. These early attempts have failed since in general they did nothing that people could not have done without credit cards. However, untraceability is still not realised since the bank that issues the digital cheque can learn what and when the user buys. Untraceability is a prominent characteristic of cash and it keeps the transaction anonymous. To achieve untraceability on the Internet, encryption techniques have to be utilised because untraceable money could easily be copied and spent again and again. The mechanism is similar to an electronic cheque but it prevents the bank from knowing who bought what. First the user opens an account at the bank on the Internet. The user asks the bank to issue a certain amount of digital cash. The bank issues that amount of digital cash using encryption technology and deducts that amount money from his account.

The content of digital cash is a combination of two huge integers, which have a special mathematical relationship. No other person but the bank can produce the data with the same relation because the calculation to do so will take an almost infinite time if one does not know the secret key, which only the bank knows. When a user pays a bill with digital cash he sends this data to a receiver. The receiver sends this data to the bank to confirm it. If the bank confirms, the bank credits the receiver’s bank account by that amount or issues the receiver another digital cash of the same amount. The bank cannot know who used the digital cash. Hence, the users of digital cash bears the major part of any transaction failure, e.g., akin to the lost of real world cash. This kind of payment is almost equivalent to a cash payment in terms of security, fee, peer to peer payment and untraceability. This is 'digital cash.' The Mark Twain banks in the USA have started a scheme like this. Another company called Oakington in the UK has launched a system that will allow any company, not just banks, to issue electronic tokens that are in effect money, over which the Bank of England has no control.

There are fundamental consequences associated with the use of digital cash. It makes transactions more efficient since they become less expensive than using the conventional bank system. The Mark Twain banks offer a zero transaction fee for its digital cash. Hence it can be used for micro payments. The Internet has no national boundaries and digital cash does not have any either. The cost of transfer within a country is almost equal to the cost of transfer across national borders. Digital cash can be used by every one while credit cards are limited to authorised stores. This increased efficiency and enlarged business opportunity can lead to less expensive and more sophisticated services for users. Multinational small businesses can become a new business trend.

But there are problems. Digital cash can cause a problem with taxation and its untraceability can encourage criminal usage in, for example, money laundering.
Untraceability will enable easier money laundering since it can be sent anywhere in the world without evidence. Since digital cash enables seamless transactions across national borders with no trace, it becomes difficult to impose sales tax on the Internet transaction. For example, a Trinidadian can put his music on a server in Barbados and sell it to a consumer in New York. Which country’s sale tax rate should be used and to whom? International talks are being held now on how to adjust taxation rules to address his problem. However, the transfer of digital cash does not leave any record, like a bank account record, that any tax authority can trace. Hence, even with these international taxation rules, taxation will not be a very easy task.

Possible Properties of Digital Cash

Digital cash may be issued only as a proxy currency, i.e., it can be issued on the same terms as existing hard currency, e.g., dollar d-cash. Yet d-cash, Euro d-cash that can be exchanged for hard currency anytime. Further, all digital cash may be 100% backed by its related money in the real world. If the digital cash is a proxy for real currency it has to have the same exchange rate applied to it with respect to another currency in the world as if it were itself in the real world. Hence, the two worlds will be linked by the exchange rates. But there will be differences in the foreign exchange markets in the two worlds. The fee for exchanging the digital cash for another digital cash currency will be much lower than in the real world. Hence the average person will be able to take part in the foreign exchange market. If the US dollar is depreciating, the holders of digital cash dollars will want to change them into other digital cash currencies. Because of the ease of transfer among digital currencies, there exists a real incentive to speculate and make digital cash portfolio changes to maximise value and shopping convenience. Hence, a massive participation by the general public can destabilise the foreign currency rate of a depreciating currency. Because of the link to the real world exchange rate, this destabilisation can affect the real world. Further, as the cyberspace economy develops, it will draw more and more money from the real world money supply. Hence the money supply of the real world will be affected by the economic activity in cyberspace.

Initially, people will have to deposit real money into a bank and request the bank to issue digital cash. If the digital cash is 100% backed by real cash then no new money will be created in cyberspace. As the economy of cyberspace expands, the banks will begin to lend people digital cash as they move towards the ‘fractional reserve system’ on the Internet, a system common in the real world. Since this new internet economy has no national borders and no central banks, dollar digital cash, for example, can be issued or created via loans by non-US banks anywhere in the world. Republic Bank of Trinidad and Tobago based on its holdings of US dollars can begin to lend digital cash dollars in cyberspace, create digital cash dollars all without the control of the FED. Thus, systemic risk of the financial system is increased.

A bankruptcy of a bank can cause a chain effect on other banks, which can escalate into a financial crisis. This phenomenon is minimised in the real world by the safety net offered by a central bank or institutionalised deposit insurance. In the Internet economy there are no central banks and no deposit insurance. The most important characteristic of digital cash is that it is transnational like the Internet. In fact, people using digital cash are themselves transnational because they can
purchase goods and service from any site on
the Internet. Further, they can keep a mix of
digital cash of different currencies that
optimises their cash value at any time. Banks
issuing digital cash are transnational because
not only, for example, US banks can issue
dollar digital cash. Thus, both supply and
demand sides for digital cash have no national
borders. Tax evasion and money laundering
are a direct result of this transnationality.
Instability is also a result of this
transnationality of people using the Internet
economy. They are no longer bound by the
borders of their country to do their shopping
or what currency to use.

The transnationality feature of digital
cash militates against the use of the TT dollar
as a denomination for digital cash on the
Internet. For example, if a man outside of
Trinidad and Tobago wishes to purchase a
quantity of rum and the choice is among TT
or Caribbean rum or otherwise, when the final
decision is made, the digital cash paid could
be either that of the nation of the supplier of
the rum or one that the supplier can easily
change into his real money or any other digital
currency on the Internet. Hence, the users of
cyberspace, instead of holding in their cash
portfolios all conceivable denominations of
monies, will automatically migrate to holding
a few key currencies that will be acceptable
all over the world. These will be the
internationally traded currencies and will
possibly move towards the US dollar the Euro
and the Yen.

Disturbance of the money supply can
come serious as a consequence of digital
cash transnationality, since the digital cash
denominated in a particular country’s currency
may be issued not only by that country’s banks
but by all other banks outside the country
which are beyond the control of the country’s
central bank. The idea of counterfeiting does
not even arise.

If digital cash had no transnationality and
was restricted to national borders it would
become nothing more than an efficient
payment system like a credit card or a bank’s
electronic transfer of funds. It will have no
real economic significance except the increase
of transaction efficiency and the velocity of
money. It would not cause taxation or money
laundering problems.

Another more adventurous approach
would be to establish a money authority in
cyberspace similar to a central bank in the real
world. The complete solution would be also
to create a whole new currency for
cyberspace, the e-$ and only this monetary
authority can issue e-$s and other banks on
the Internet can use this cash as basic money
to issue their bank’s digital cash. The e-$ will
need to have exchange rates with respect to
the real world currencies.

Emerging Economies

If it is assumed that the cyberspace
economy will grow even in emerging
economies, then the major impact on the
economy will be due to the transnationality
of the e-commerce market. In fact, this
characteristic really makes the local cyber
economy completely independent of national
borders. First, the digital cash for business
will not be, for example, TT dollar based, as
already discussed. Hence any local to local
e-commerce will be conducted in, for
example, US dollar digital cash. This will
make dollarisation of the economy more
acceptable if not inevitable. Secondly, the
Central Bank’s regulation of the local financial
sector with respect to liquidity is important
in exchange rate control. But the Central
Bank will have no jurisdiction in cyber space and, as a result, no control on the liquidity relating to resources held in digital cash by locals. Hence e-commerce activities can impact upon the local real world economy, and the Central Bank will be unable to respond. Yet this connection with the local real market has exchange rate implications. It is worth noting that even though the local banks hold US$ currency, their dealings in it are controlled by the FED. For example, they cannot create money.

In general, financial liberalization has made emerging economies more volatile and has reduced the Central Bank’s ability to intervene to control the economy. E-commerce can make the local economy truly global and liberated, hence contributing significantly to the volatility of the market.

**Conclusion**

Digital cash will indeed improve the commerce on the Internet. However, its transnationality can present some problems such as taxation evasion, money laundering and even economic and financial stability. If the digital cash and the cyber space economy were to take off as a major means of doing business, there will be conflicts between national and international interests.

This paper makes no claims on how e-commerce will develop. It simply paints possible scenarios that can be spawned by the Internet itself.

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