Fundamentally, electronic money is no different than all other forms of money that exist today. Consequently, the monetary policy implications of electronic money are nil. Hopefully, though, debating the implications of electronic money will spark an overdue recasting of monetary theory that will reflect present-day monetary realities rather than increasingly detrimental fictions. The new monetary theory should trigger the abandonment of interventionist monetary policy as we now know it because this theory will provide the basis for relying entirely on market forces to produce non-inflationary economic growth and financial stability.

**Money, Electronic Money, and Credit**

All forms of money that circulate in the United states today are forms of credit that also serve as media of exchange. For example, currency is a credit instrument because it is a liability of its issuer, the federal government. Technically, currency is simply a small denomination, non-interest-bearing bearer bond of no fixed maturity that governments issue for just one reason -- it provides interest-free debt financing. As a credit instrument, currency serves as a store of value for its owner; as a medium of exchange, it facilitates transactions. Specie, that is, gold and silver coins, is the only form of money that is not credit, but such coins no longer circulate in the economy.

Checkable bank deposits also are forms of credit -- they are liabilities of a bank -- as well as a medium of exchange. Unlike currency, though, checking account balances, along with noncheckable deposits, finance bank assets, specifically loans and
investments. Travelers checks, such as those issued by American Express, likewise are 
credit instruments used to finance the issuer's assets. Debit cards, per se, are not money; 
instead, they are "keys" that provide electronic access to checkable bank deposits. 
Therefore, they can be used to issue what effectively are electronic checks (technically 
"value transfer instruments") that transfer deposits from payer to payee.

Electronic money, which is the money balance recorded electronically on a 
"stored-value" card, also is credit, for the balance on the card is a liability of its issuer. The 
issuer uses funds paid by the card holder to acquire assets. However, the legal evidence of 
the issuer's liability consists of electronic bits and bytes recorded on the card. For currency, 
the legal evidence of liability is the piece of currency itself. For bank deposits, the legal 
evidence of a bank's liability resided for a long time on paper ledger cards or savings 
passbooks; today, that liability almost always is evidenced by bits and bytes in a bank's 
computer.

**Limits on the Growth of Electronic Money**

The potential for fraud will greatly constrain the growth of electronic money. That 
is, issuers of stored-value cards will have to hold electronic counterfeiting to a very low 
level if they wish to make money. Just as retailers fight a never-ending war against 
shoplifting, issuers of stored-value cards must continually try to outsmart hackers attempting 
to increase the balance on stored-value cards.

Given the frequency with which hackers penetrate supposedly secure computer 
networks, issuers of stored-value cards will have to wage a constant battle to protect 
themselves against fraud losses. Worse, they will not be able to respond quickly to a
subversion of the security measures on stored-value cards (such as encryption algorithms) due to the time and expense that it will take to replace the compromised cards.

Presumably specific transactions could be recorded on stored-value cards ($14.32 was transferred from card X to card Y or to merchant Z), which would create an audit trail by which the card issuer could determine who picked its pocket, when, and for how much. Audit trails, however, get cold quite quickly when money is moving rapidly through international commerce, which supposedly is one of the attractions of electronic money. Consequently, card issuers will be able to protect themselves against fraud only if data on large transactions is transferred frequently from the card to the card issuer's computer. In that case, though, the card essentially becomes a debit card, merely activating the transfer of a deposit on a bank's books from one party to another.

Holders of stored-value cards will be reluctant to carry large balances on their cards because of the loss that they will suffer if their card disappears or the balance is erased. Hence, while stored-value cards will be used to pay for small purchases, currency will still be preferred for large or illicit purchases and in situations where currency is now held for store-of-value purposes rather than for transaction purposes. For example, it will be much safer to hide ten-$100 bills in one's home rather than carry a $1,000 balance on a stored-value card used frequently to make small purchases.

Because of fraud and lost card problems, stored-value cards will not carry large balances. Consequently, the aggregate amount of credit supplied by card users to card issuers will not be enormous. For example, if half the U.S. population over the age of fourteen carried a stored-value card, 100 million cards would be in circulation today. Assuming an average balance on these cards of $100, the total amount of liability recorded
on these cards would be $10 billion. That amount equals just 2.5 percent of the total amount of U.S. currency in circulation or 5-7 percent of coins and currency circulating inside the United States (according to Fed estimates, 50-70 percent of U.S. currency circulates outside the United States).

These numbers suggest that electronic money will not materially reduce the quantity of currency in circulation unless the velocity or turnover rate for electronic money is much greater than it is for currency that is held for transaction purposes.

These figures raise questions about the potential profitability of stored-value cards. Invested at a 6 percent yield, $10 billion of balances on stored-value cards would generate $600 million annually of income for card issuers, or $6 per card. Given the cost of marketing and providing cards and card readers, telecommunication and computer expenses, as well as fraud losses, will card issuers also have to charge relatively high transaction fees that would discourage card use for the small transactions for which stored-value cards are most suited?

**Monetary Policy Implications of Electronic Money**

The monetary policy implications of stored-value cards are nil, with one exception. The only policy issue of any significance will be the federal government's loss of "seignorage" income; that is, the interest savings the government earns by issuing non-interest-bearing debt in the form of currency. Using the example cited above, a $10 billion shift in credit from government-issued currency to privately issued stored-value cards would cost the federal government about $600 million annually in seignorage income; that is, its annual budget deficit would increase by that amount because it would have to issue an additional $10 billion in interest-bearing Treasury debt.
The government could recapture some of that lost income by treating the balances outstanding on stored-value cards as the equivalent of checkable bank deposits, which would then subject card balances to a reserve requirement, currently 10 percent in most cases. (Technically, owners of reservable deposits are forced to make an interest-free loan to the federal government that passes through the banks.) That reserves "tax," though, would impede the use of stored-value cards by reducing their profitability to card issuers. Therefore, unless Congress wants to stamp out the widespread use of stored-value cards, increased usage of such cards will add slightly to the budget deficit.

Electronic money will not have any other monetary policy implications because monetary policy today consists entirely of the Fed's interest rate signalling activities, which are discussed below. Contrary to widely held belief, the Fed does not control the money supply, for two reasons. First, the Fed, acting on behalf of the U.S. Treasury, passively supplies whatever quantities of currency that people voluntarily want to hold. This passivity exists because the federal government can no longer force currency into circulation since it does not pay its bills and other obligations in currency.

Second, the Fed passively supplies the banking system with whatever reserves banks need to meet their reserve requirement so that the Fed can send interest rate signals to the financial markets through its manipulation of the quantity of "excess" reserves. Excess reserves, which average about $1 billion, are those reserves that exceed what the banking system as a whole needs to meet its reserve requirement; in effect, excess reserves float on top of a demand-determined quantity of required reserves.

Because the Fed supplies whatever quantity of required reserves the banking system needs so that the Fed can manage the quantity of excess reserves, required reserves do not
limit the quantity of reservable deposits, which in turn account for less than 25 percent of all deposits. Therefore, if banks increase the quantity of reservable deposits in the course of their lending activities, the Fed automatically supplies the additional reserves demanded by that deposit growth. Hence, the reservable deposit portion of the money supply, like the currency portion, is entirely demand-driven. Consequently, since the Fed does not control the money supply, treating balances on stored-value cards as deposits will have no monetary policy implications.

**Monetary Policy Today: Rate Signalling**

As noted above, monetary policy today consists entirely of the Fed's interest rate signalling. Specifically, the Fed's Federal Open Market Committee periodically sets and openly announces a Fed Funds Rate Target (FFRT). That is, Fed bureaucrats tell the financial markets what they, the bureaucrats, believe should be the benchmark rate off of which other short-term interest rates should be set. The Fed then manipulates the quantity of excess reserves so that it can hold the daily Fed Funds rate close to the FFRT. The daily Fed Funds rate is the overnight rate at which banks lend reserves to each other so that each bank can meet its reserve requirement, or effectively pay its reserves tax, over a two-week reserve "maintenance" period.

Interestingly, except for the daily Fed Funds rate, the Fed cannot move interest rates through brute force, the buying or selling of large quantities of Treasury securities. Unfortunately, many financial market participants still believe that the Fed can move rates generally. In fact, the Fed's influence over interest rates stems entirely from the perception that it can move rates, much as the Wizard of Oz's influence over the Munchkins grew from their belief in his power. Toto, though, revealed the truth.
Any attempt by the Fed to move interest rates generally by buying or selling large quantities of Treasury securities (several billion dollars, or more) over a day or two would quickly backfire because these transactions would cause the daily Fed Funds rate either to plunge to almost zero (the Fed buys securities, increasing excess reserves) or to skyrocket (the Fed sells securities, reducing or eliminating excess reserves).

Either action would open up a wide gap between the daily Fed Funds rate and other interest rates because neither action would alter the net amount of federal debt outstanding; such actions would only adjust the mix of the government's interest- and non-interest-bearing debt. However, that rate gap would have two adverse consequences for the Fed if the gap persisted for more than a few days. First, the gap would destroy the perception that the Fed could move interest rates generally.

Second, a prolonged gap would greatly shrink the size of the Fed Funds market as individual banks harmed by the gap (they receive a below-market rate on Fed Funds lent or pay an above-market rate on Fed Funds borrowed) would quickly align their actual reserves with their reserve requirement. Banks would do so through balance sheet manipulations designed to minimize the cost of their reserves tax. Once burned, banks would be slow to expose themselves again to the risks of the Fed Funds market. Interestingly, a sharp change in the quantity of excess reserves would not influence bank lending or the money supply because reserve requirements now do not influence lending.

**Markets Can Control Inflation Better Than The Fed**

Today's reality is that the Fed is impotent as a mover and shaker in the financial markets. All it really can do is express its opinion about interest rates. The Fed focuses on interest rates, and not the money supply, because interest rates are the principal factor
controlling credit growth, particularly in the short run. The rate of credit growth is crucial because it is credit, not money, that finances the purchase of goods, services, and assets; as noted above, money is merely that portion of the credit supply that also serves as media of exchange. Inflation therefore is caused by excessively rapid credit growth; that is, purchasing power, boosted by the rapid credit growth, grows faster than the supply of goods and services available for purchase.

The unspoken conceit underlying the Fed's interest rate signalling is that Fed bureaucrats are better qualified than the financial markets to price an economic good, which credit is, specifically to hold credit growth to a non-inflationary rate. That conceit is fallacious, though, as it is in all markets, since it is in the financial markets' self-interest to set nominal interest rates that will produce non-inflationary credit growth. This is the case because of the clearly opposed interests of debtors and creditors (debtors like inflation; creditors like deflation). That is, the bargaining between debtors and creditors should produce interest rates that will generate neither inflation nor deflation.

Recent U.S. inflation has been caused by various government distortions of interest rates, including at times the Fed's signalling of excessively low interest rates that the financial markets have unwisely followed. However, the growing power of the financial markets is slowing undermining the ability of governments and their central banks to distort interest rates, which is why inflation has been declining throughout the world. Getting the Fed out of the rate signalling business would help that process.

**Conclusion**

Hopefully, the debate over electronic money and stored-value cards will lead to a fundamental examination of present-day monetary realities that will replace fact with
fiction, thereby forming the basis for a monetary theory that relies on market forces, not central banks, to produce non-inflationary credit and economic growth.