

THE IMPACT OF DIGITAL MONEY ON CENTRAL BANKS

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Money as we commonly know it--that is, currency, coin, and checks--is in the process of disappearing. The Internet, digital electronics, public key encryption, and the rapid price declines in computing power and telecommunications bandwidth are causing fundamental changes in the financial world. Financial transactions can be settled in real time even though the contracting parties may be thousands of miles apart. Money and financial assets can be moved at almost the speed of light to any point on the globe for a minuscule cost and with almost complete security through the use of encryption programs.

Traditional electronic transfer payment systems, such as credit and debit cards and wire transfers, which usually require online authorization and the debiting and crediting of bank accounts for each transaction, have been replacing paper currency and checks for several decades. However, now we are entering a whole new world of digital money, which is the monetary value of government-issued or privately-issued currency units stored in electronic form in an electronic device (i.e., computer, personal digital assistant, cell phone, smart card, etc.). The monetary value stored in the electronic device can be transferred to other such devices, allowing the users to engage in payment transactions.

A monetary value may be stored in a computer chip on a smart card, or stored on a computer chip in a wireless device, or on a computer disk drive. Money transfers with cards are most often made through card reader/writers, while transfers using computers or wireless devices are made over wired or wireless communication networks, such as the Internet. Cards, wireless devices, and computers can also be used to merely authorize transfers from one account to another. These accounts may be held in bank accounts or in accounts held in nonbank institutions. Stock, bond, mutual fund, and even gold deposit accounts may allow ownership transfer of assets, even in micro amounts, to be made by computer or wireless devices. All such

transfers are protected by cryptographic codes. The technology exists to make such transfers either fully recorded or anonymous (like paper currency), depending on the system and consumer's choice.

How rapidly digital money is adopted by consumers depends on how its cost, convenience, and anonymity are perceived in relation to paper currency, coin, and checks. Eventually, electronic transfer and digital money systems will replace paper currency, coins, and checks, because they can greatly reduce transaction costs and will ultimately become more convenient. At the current level of technological advance, it appears that within a relatively few years, whether they involve a few cents or millions of dollars, almost all monetary transactions will move over the Internet, or by wireless device, or by smart card for small transactions. The question of anonymity will remain an impediment until policy makers understand that the fundamental desire and right to personal privacy must be accommodated with the new technologies, to an extent no less than people now have with cash.

As people use increasingly more bank and nonbank digital money for transactions, the demand for government money is reduced. As we evolve to a world where consumers become both increasingly financially sophisticated and where they are given a greater number of payment and relatively liquid balance holding options, more money will be held in higher yield investments, and less in low yield bank demand deposits and negative yield cash. Specifically, it appears that we are evolving to a system where people will hold most of their liquid net wealth in an account that holds their stock, bonds, and various money market funds. People will access their accounts by computer or wireless device through the Internet. They will also keep small balances for micro purchases and vending machines on a smart card, which they will replenish through their computer or telephone. Many, if not most, of the liquid wealth accounts will not be

held in commercial banks, but in brokerage firms. In fact, even today there is no need to have an account in a commercial bank, because most major brokerage firms offer accounts that can be accessed by checks, credit and debit cards (with ATM privileges). At the same time, there is an increased array of both narrow, money-like products--such as balances held on telephone cards, and frequent flyer miles that can also be used to buy other goods and services--and broad-use money substitutes, such as e-gold (a digital gold product).

All of these developments result in less “money” being held in traditional forms in banks, and reserveable, hence the monetary base as a percentage of GDP will continue to fall. When non-government money reaches a critical mass whereby most users and businesses find they can do a substantial portion of their business in some form of private digital money, virtually all money and money substitute products will be converted to central bank-issued money at some point. In addition, as more and more settlements are made in “real time” as a result of instant electronic transfer, the velocity of money will increase, further decreasing the demand for money.

One effect of the decrease in demand for central bank money will be the gradual disappearance of central bank seigniorage revenue. At present, the world’s central banks make a considerable income from issuing paper banknotes, which are non-interest bearing central bank liabilities. According to the Bank for International Settlements, among the G-10 countries, seigniorage as a percent of GDP ranged from a low of .28 percent in Great Britain to a high of .65 percent in Italy in 1996, while the United States number stood at .43 percent. (The main reason that the United States number is relatively high is that U.S. paper dollars--particularly \$100 bills--are widely held by foreigners outside the United States. They are used as a substitute for liquid savings by people in countries, such as Russia, with an unstable monetary system.)

The revenue central banks receive from seigniorage not only pays for all their operations, but also provides the national treasuries with significant revenues. This reduction in revenue has caused concern among some government officials. However, it is apparent that the efficiency gains for the economy from digital money and electronic transfer swamp any negative impact on government revenue from the loss of seigniorage, which has been in effect a tax on the banking system. Private companies that issue smart cards and similar devices will receive some of the seigniorage that now goes to central banks. Finland is perhaps the furthest along in moving to electronic transfer and various forms of digital money, and it clearly has been a net plus for the Finnish economy.

In major economies, cash is the largest component of central bank liabilities. As previously discussed, the growth in both real time electronic payments and various types of digital money will cause a continual drop in banks' demand for settlement balances. Thus the balance sheets of central banks will shrink significantly. However, this shrinkage will be obvious and gradual, and should not significantly impede the ability of central banks to conduct open market operations for many years and should not be worrisome.

In addition, as more and more transactions are settled on a real time basis, the risk of non-payment and fraud declines, and hence the need for regulation and monitoring should also decline. Ultimately, the role of the central bank may ultimately shrink to doing nothing more than defining the numeraire for the national money. Specifically, a national currency in the future may well be defined as a monetary unit that is equal in value to a specified quantity of a basket of goods and services, whose individual prices are set by global auction markets--such as international commodity exchanges.

Some central banks might also continue to serve as a lender of last resort to large financial institutions by using off balance sheet transactions. The need for such a lender of last resort should diminish in a world of instant information on almost all activities and institutions, and real time settlements, and as the relative role of commercial par value banks declines. In the new century, the kind of financial shocks and surprises experienced in the past ought to be increasingly rare, unless financial regulators interfere too much with the market adjustments that will naturally occur in a world of increasingly perfect information.

This rosy scenario could be undermined by central bankers, and treasury officials, who try to impede the new technologies. As previously noted, many people will not accept giving up paper currency and coin, unless they are assured that the new digital monies will give them the same degree of anonymity. Unfortunately, attacks on financial privacy from U.S. Treasury officials, EU officials, and the OECD have increased in recent months. The basis of the attacks is the argument that the war on money laundering must be stepped up. However, the empirical evidence is that the war on money laundering has not been the least bit cost effective, has attempted to turn bank employees into policemen, has violated basic civil liberties and abused the privacy rights of many people, and has probably resulted in an increase in crime rather than a reduction. It is true that criminals will take advantage of the right of financial privacy and the new technologies, in the same way they have taken advantage of automobiles, telephones and computers, which are not banned. The fear of criminal abuse is not a sufficient reason to deny people the enormous economic benefits of moving to e-payments and digital money systems that protect the basic privacy rights that are necessary for a free and civil society.