THE FREEMAN
IDEAS ON LIBERTY

Spending Money Freely

by Lawrence H. White

In the last year, I have begun to buy things *without* using coins, paper money, a credit card, or a checkbook. You may begin to do likewise next year, or you may have begun a few years ago, though neither of us could have done it ten years back. I've actually learned two new ways to pay.

I bought a bag of groceries last week by swiping my "debit" card (the same card I use at an automatic teller machine, or ATM) through a small card-reader—mounted right next to the little check-writing platform for people who still use checks—and keying in my four-digit PIN (personal identification number). I thereby electronically authorized a transfer of funds, from my bank account to the supermarket's, equal to the $25.96 being displayed on the cash register as my total bill. In a matter of seconds—before my groceries were completely bagged, in fact—the cash register spit out my itemized receipt to signal that the payment was good. Last summer I used a service station along the interstate with similar card-readers and receipt-printers mounted by and wired to its gasoline pumps, allowing any debit-cardholder to buy gasoline at any hour without any station employee having to be on duty to process the payment. Before too long, just about every point of sale that takes credit cards will probably also take debit cards.

Yesterday I used a second novel way of paying at a nearby copy shop. The shop's self-service photocopier didn't take coins, paper money, credit cards, or even a debit card. Instead I put a plastic card bearing a magnetic strip on its back into a reader, which displayed in glowing yellow digits how many dollars-worth the card "carried." (On an earlier occasion I had purchased the card from a nearby machine, which had "loaded" the card with the dollar amount of paper money and coins I put into the machine. When the card balance gets low, it can be topped up at the same machine.) I watched the yellow number go down by .07 with each copy produced. In the future a single prepaid card, probably carrying a microchip rather than a magnetic strip, may be usable in a wide variety of transactions. Imagine the convenience if the same card were accepted by photocopy machines, soda machines, pay telephones, and even by the cash registers in ordinary retail shops. Imagine if the card balance could be topped up at an ATM—or even at your home computer—by transferring funds from your bank account. Such "smart cards," as the idea is known, would amount to a bank-issued currency, a modern equivalent of the private banknotes that circulated before governments monopolized the issue of currency.

New Ways to Pay: The Advantage

These new payment methods are spreading. Smart card systems have been introduced in Denmark, Singapore, and Eng-

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land.[1] Here in the United States, retailers are finding card-readers increasingly cheap to install, and growing numbers of customers are discovering the advantages of debit and prepaid cards. In a world where people are increasingly in a hurry, they speed the act of paying—no need to have the right change or to wait for change in return, no need to write out a check, no need to stop at the bank counter or ATM to get more cash. Paying by debit card or smart card will often be more convenient than paying with cash. A debit card is even better than cash or a smart card in at least two respects: using a debit card keeps your money in your bank account, where it is both more secure from theft *and* earns interest, right up to the moment it is spent.

Some observers are skeptical that payments methods will change dramatically any time soon. What happened to the predictions a decade ago that soon everyone would be banking electronically by home computer? Actually, home banking is now finally growing in popularity, for several reasons. Touch-tone phone-banking services, along with ATMs, have acclimated people to electronic banking; home computers and modems (devices to transmit computer information over telephone lines) have gotten cheaper; home banking software has gotten easier to use; and increasing numbers of households are subscribing to on-line services like Prodigy that include electronic home banking and bill-paying among their offerings.[2] Hundreds of thousands of people now make hundreds of millions of dollars worth of monthly payments electronically by typing and mouse-clicking at their home computers. (I'm not yet one of those people, but check back with me in a few years.)

An even more dramatic development in the last few years, with possibly profound implications for the payments system, has been the growth of the Internet, the decentralized worldwide network of interlinked computers across which users send electronic mail ("e-mail"), post messages to "newsgroups" for public discussion, and browse for and download information. The Internet is estimated to have had 30 million users at the start of 1995, and to have been growing at the amazing rate of 10 percent per month.[3] Like many in academia and business, I often spend an hour a day reading and sending e-mail and newsgroup postings. The Internet was originally non-commercial, but with tens of thousands of business firms now connected, plenty of business is already being done by e-mail. Those who "log on" to the "Net" or "go on-line" daily are natural candidates for convenient on-line retail shopping, and commercial Internet sites have begun to appear. On-line catalogs—fast becoming "virtual shopping malls"—have long been a staple of Prodigy, Compuserve, America On Line, and the other proprietary networks.

But how to pay for an item selected from your computer screen? For some transactions, you might want to send a credit card number by e-mail. I have actually renewed a magazine subscription this way, but I had to worry about my number being intercepted by a computer "hacker." The profit motive is now hurrying to the rescue: Microsoft and Visa, the software and credit-card giants, have recently announced a joint project to develop a user-friendly way to encrypt (encode) and decrypt credit-card numbers sent over e-mail to assure security in such transactions.

For other transactions, a way to "pay cash" over the Internet would be a winner. Several firms are now developing systems for "digital cash" or "e-money," most notably DigiCash, founded by cryptography (code-making) expert David Chaum. These systems allow an electronic funds transfer to be launched from a personal computer as easily as from a supermarket's debit-card-reader.

Privacy Concerns

There is, however, a potentially large fly in the ointment of these new payments methods. Unlike a paper-money or prepaid-card transaction, a credit-card or debit-card transaction typically lacks privacy. Using electronic deposit transfer or a credit card (either in person or via computer), like

writing a check, generates a trail. Your bank's or card company's computer ends up with a list not only of how much you've spent, but of where you spent it. The same list could be constructed by combining the information held by all the vendors from whom you bought. This list is potentially available to the IRS or to other government agencies who may want to commandeer it. If you don't have a contract with your bank and vendors expressly forbidding it, the list is potentially available to credit bureaus or junk-mail firms who may want to buy the information. The privacy issue understandably concerns many people who are perfectly law-abiding citizens.

Fortunately, computing and cryptographic experts like Chaum are working to develop methods for *anonymous* electronic payments. One set of models for anonymous payments uses the "smart card" method (the funds to be transferred have already been downloaded onto a smart card or personal computer); an alternative set uses electronic deposit transfer either by debit card or by personal computer. For an example of the deposit-transfer type, suppose I wish to pay you $100 anonymously without using physical currency. (I might be standing at your cash register, or I might be home at my computer looking at your invoice on my screen.) By merely typing in my PIN, or clicking on a "pay" button on my computer screen, I send a cryptographically "signed" (or PIN-authorized) and numbered (you have assigned the number) message to my bank that instructs my bank to transfer $100 to an account (whose name is encoded) at your bank. My bank reads the "signature," and knows the message is genuine. My bank can't read the recipient account name, so doesn't know to whom the money's going (only to which bank). Your bank can't read my signature (which my bank may have removed), so doesn't know from whom the money came (only from which bank, and in favor of which account). You read the transaction number to know the payment came from me (though you might not know my name).[4] You then hand me the goods, or ship them to my private post office box.

Are bank customers actually eager to pay cost-covering prices for privacy features of this sort? I don't know. The market will tell us, assuming that government does not interfere. Some federal authorities have suggested that they would object to a completely untraceable version of smart-card or debit-card payment, because it *might* be used to hide transactions they want to tax or prohibit. To be consistent, such authorities should also object to the availability of untraceable $100 bills. Chillingly, some do.

Keeping the Government Off-Line

What role does the government need to play to orchestrate the shift to new payments methods? None whatsoever. Governments of the past, after all, played no role (or no *constructive* role) in the transitions from barter to commodity money, from raw metallic money to coins (though ancient despots later discovered profits in monopolizing the mints and in debasing the coins they produced), from coins to banknotes (though government-sponsored central banks later monopolized their issue and diluted their value as well), from currency to deposit transfer, cash to credit cards, checks to debit cards, or locally to nationally accepted ATM cards.[5] The shift to electronic payment methods is taking place already, without the Federal Reserve having taken any official position or promulgated any rules on digital cash or smart cards. Private ATM networks and credit-card networks already exist to set interconnection standards where new standards are needed.

Debit cards, being just a paperless substitute for checks, don't raise any important regulatory issues. But won't private banknote-like smart cards, being a new privately issued form of money, need regulation once they catch on? Don't they threaten an inflationary avalanche of electronic money? Absent central bank restrictions, what will limit the quantity of smart-card-loaded "dollars" commercial banks can create? The answer to the first two questions is no, because the answer to the

third is that a bank's obligation to convert card-balance dollars to scarce reserve dollars (physical currency or account balances at the clearinghouse) on demand naturally limits the number of card-balance dollars a bank will find it prudent to create given the size of its reserves.[6]

There is more at stake for you and me in electronic funds transfer than simply more convenient payment methods. One major potential advantage of electronic funds transfer via personal computer is that it may give ordinary consumers affordable access to offshore banking. With direct deposit of paychecks, and with old-fashioned cash available at ATMs whenever we want it, few of us really need to visit our banks in person anymore. Why not keep your account at a reputable foreign bank (perhaps a branch of a major Swiss bank) in the Bahamas or the Cayman Islands? Such an offshore account is perfectly legal (though a U. S. bank's offshore branch is prohibited from directly doing business with American citizens or firms), but not worth the trouble for most individuals or small businesses today. If an offshore bank were linked to the clearing system and to an onshore ATM network (or if access to physical cash were irrelevant because all cash-like payments could be made by debit card or smart card), more of us could begin enjoying the advantages of offshore banking that big-money players and large firms have enjoyed for years. Offshore banks pay higher interest on deposits because they are free from the taxes on deposit balances that the U.S. government levies in the form of reserve requirements, deposit insurance "premiums," and taxes on bank earnings. Individuals who are concerned about privacy should also find an offshore foreign bank attractive for its lesser propensity to surrender its records to domestic authorities.

Just as a variety of old and new forms of payment are available today, old-fashioned payment methods like cash and check-writing can be expected to persist well into the twenty-first century. There they will coexist with smart cards, debit cards, personal-computer-launched deposit transfer, and perhaps other new electronic methods of payment. If and when Prodigy, Compuserve, and Internet sites begin offering offshore banking services, things should really become interesting. An exodus of retail banking business from the regulated sector to a free banking sector will shrink the fiefdom of federal banking authorities. Let us hope the authorities accept that fate gracefully. □

1. For an account of recent and possible future developments see Steven Levy, "E-Money (That's What I Want)," *Wired* (December 1994), pp. 174ff.

2. David C. Churbuck, "Let Your Fingers do the Banking," *Forbes* (19 August 1991), pp. 122–24.

3. "So Much for the Cashless Society," *The Economist* (26 November 1994), pp. 21–23.

4. In Internet lingo, this method preserves privacy by using the two banks as semi-anonymous "remailers" of different parts of the payment message. Privacy could be increased even further by having a clearinghouse relay the message so that neither bank even knows the identity of the other bank. For an enlightening explanation of how the necessary encryption method works (such that my computer can encode a message that *only* the intended recipient's computer can decode), see Hal Finney, "Protecting Privacy with Electronic Cash," *Extropy* #10 (Winter/Spring 1993), pp. 8–14.

5. For brief accounts of how these practices emerged in the market see George A. Selgin and Lawrence H. White, "The Evolution of a Free Banking System," *Economic Inquiry*, vol. 25, no. 3 (July 1987), pp. 439–57.

6. The theory of the natural limit to banknote volume under "free banking" applies equally to smart-card balances. See George A. Selgin and Lawrence H. White, "How Would the Invisible Hand Handle Money?," *Journal of Economic Literature*, vol. 32, no. 4 (December 1994), pp. 1718–49.

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Phones and Freedom

by Marty Mattocks

After a recent departmental meeting at work, my boss asked a colleague and me to stay and discuss progress on a common project. After we had dispensed with the business at hand, the discussion moved on to new topics and an open-ended question and answer period. In this relaxed atmosphere I asked my boss to bring me up to date on what was outlined on the blackboard behind him: a recent proposal by an alternative long-distance provider for cutting our telecommunications costs. We are mutually responsible for providing technical support to a relatively large company with its own telephone switch and so I am curious to learn all I can about this dynamic field.

He went over the physical layout of the company's equipment and services, highlighting the advantages and improvements that had been made over the competition's current approach. This was one of the "big three" long-distance companies and a sizable investment of billions of dollars had been made in building transmission towers and installing sophisticated state-of-the-art equipment and software, all for the purpose of acquiring new customers in order to make a profit. At this point, my colleague made an interesting statement—one of those remarks that grabs your attention but you don't know why until you think about it later. He said, "I don't know how these companies can justify all this duplication of equipment," or something along that line. The wheels inside my head began turning as the conversation drifted off to other topics.

Yes, how can companies like these justify the expenditure of billions of dollars to duplicate something that is already there? I was intrigued by the sentiment I had just heard—genuinely and honestly expressed—one of those attitudes that are the real root causes behind much of what goes on in our world.

I am not being judgmental. We all have first impressions that often are out of our mouths before being processed by our brains. But as I gave my colleague's honest query more thought I began to see in a microcosm much of the wisdom and many of the benefits of the free market philosophy, along with the disadvantages of its alternative. Let me explain.

The Benefits of Competition

In our community—within one block—there are two supermarkets, each with its own bakery and deli and aisles upon aisles of foods in every shape and form. Within the same block are three banks, each offering competitive rates on certificates of deposit, home equity loans, and checking accounts. These enterprises compete against one another for customers and must do so at the right price and by providing the best value for that price. They all have expenses which include the cost of their property, equipment, labor, and advertising. The more efficient a firm's system of providing goods and services at the lowest possible cost, the

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