

DOES ELECTRONIC MONEY MEAN THE DEATH OF CASH?

Cash is dirty. Cash is heavy. Cash is quaint. Cash is expensive. Cash is dying.

—New York Times Magazine

We've heard the techno-babble for years about a cashless society. But only now is the propeller-head contingent putting its digits where its mouth is.

—Newsweek

ELECTRONIC MONEY HAS received much media attention recently, with journalists and economists alike predicting the impending “death of cash.” Some analysts forecast that within a few years the new electronic means of making payments will have permanently altered the payments system as we know it, with E-money completely replacing currency in the U.S. economy.

This article attempts to put the development of electronic money into a more realistic perspective. Rather than being a revolution unto itself, electronic money is really just another financial innovation within a payments system that is constantly evolving. During the early part of this century, most transactions were conducted with either cash or checks. In the 1960s, charge cards and credit cards provided the first alternative means of making payment. Deregulation of the financial institutions in the 1970s and 1980s brought about another round of financial innovation in the form of NOW (Negotiable Order of Withdrawal) accounts and money market funds, as well as the increased usage, acceptance and liquidity of bond and equity funds.

Considering the rapid pace of technological advancement over the past decade and consumers' growing desire for convenience, the development of electronic money is no surprise. Indeed, the widespread use of electronic money

is certain to have an impact on the way we do business in our economy, but it may be a bit premature to pronounce currency dead just yet.

What Is E-Money?

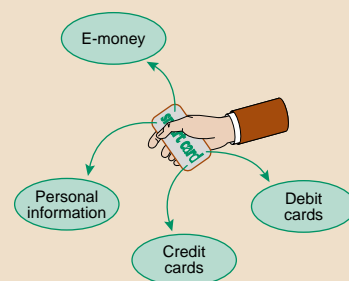
Despite the recent hype, many people are not sure precisely what is meant by the term *E-money* and the lingo that has developed around it. In a nutshell, electronic money refers to balances stored on a computer chip embedded in a *smart card* that can be used for transaction purposes. Because they are usually equipped with a central processing unit and have both long- and short-term memory, smart cards are capable of serving a variety of purposes at once. Chart 1 illustrates the possibilities of smart cards. It is technologically feasible for a single smart card to serve simultaneously as an electronic money card, several credit cards and a debit card, as well as contain personal information and identification such as a driver's license and emergency medical information. The smart cards in use today hold only electronic money, making them simply stored-value cards.

Although E-money is often touted as being equivalent to cash, there are both similarities and differences between the two instruments. Like cash, E-money (as well as checks, credit cards and debit cards) serves as a means of making payment in so much as

merchants are willing to accept it in exchange for goods and services. In addition, E-money has several “cash-like” qualities, such as anonymity and the ability to transfer value at the point of sale without engaging a third party (as with credit cards and debit cards). A key distinction, however, between E-money and cash is the issue of final settlement. With currency and coin, final settlement takes place the moment a transaction occurs. With E-money, final settlement must still be made with cash or bank reserves. In other words, electronic money is just another instrument for transferring ownership of cash or bank reserves from one party to another.

To bring this difference between cash and E-money into sharp relief, Chart 2 illustrates the clearing and settlement of a transaction conducted with currency and a transaction using electronic money. When consumers use cash to purchase goods and services, the transaction is settled on the spot. A transaction conducted with E-money must go through a more complicated clearing and settlement process, similar to that of a check. Depending on the arrangement between the consumer and the institution that issues the E-money, an individual downloads electronic money from his or her account onto a stored-value card by telephone, an ATM machine or perhaps a personal computer. The issuing institution then transfers balances from the

Chart 1
Smart Card Potential



individual's account into its own general account. The individual may then spend that E-money with a merchant equipped and willing to accept the institution's electronic money, or may transfer balances to another individual who holds a smart card. The merchant then collects all its E-money balances at the end of the day and deposits them into its own bank, which settles directly with the institution that originally issued the E-money or indirectly through some type of clearinghouse.

The clearing and settlement of transactions made with E-money and transactions made with a check are quite similar, except with regard to *float*. The float associated with a check is the interval of time that begins when a merchant receives a check in payment for a purchase and ends when that check clears the bank upon which it was written. Clearly, the benefit from the float on checks goes to the consumer, especially in the case of interest-bearing checking accounts. The float with E-money, on the other hand, benefits the issuing institution since funds are transferred to the institution's account from the consumer's account the moment E-money is downloaded

and remain there until the merchant's bank redeems them. Unless unspent E-money balances earn interest, the issuers of E-money will reap the benefits from the lag between the time E-money is downloaded onto the card and the time the transaction clears the issuing institution.

Just Another Financial Innovation

Electronic money has been hyped as a revolutionary development in the payments system, the likes of which have never been seen. Considering that a smart card with an embedded computer chip is like having a computer in your wallet, the technology surrounding E-money is indeed amazing. Nevertheless, the notion that a new means of payment, such as E-money, might displace an old means of payment, such as cash, is not new.

Chart 3 illustrates how the financial system and the notion of money have evolved over the past 25 years. Before 1970, money as a means of payment and a store of value was limited to three instruments: cash, demand deposits and interest-bearing savings accounts.

As the shaded areas of Chart 3 indicate, the value of currency and demand deposits in the economy has grown since the early 1970s. At the same time, however, there has been explosive growth in other payment instruments and means of holding wealth. In addition to traditional savings accounts—which held the lion's share of deposits until the late 1960s—there are small time deposits (CDS) and Other Checkable Deposits (OCDs), which both pay interest. These two innovations evolved to compete with traditional savings and checking accounts by offering higher rates of return in exchange for somewhat more limited access to funds. Innovation has taken place outside the traditional banking sector as well, with money market funds and bond and equity funds growing in value over the past 15 years to the point that they are now roughly as large in value as traditional savings accounts.

Why the explosion in alternatives to cash and demand deposits? Deregulation of the financial industry and a dramatic decline in transaction costs have made it possible for average citizens to hold their wealth in a way similar to what large firms and wealthy individuals have done all along—that is, hold financial assets that earn a relatively high rate of return, then rapidly liquidate those assets to meet expected expenditures. In other words, it is now easy and cheap to charge everything from groceries to gasoline on a credit card (which often offers incentives for use, such as free airline miles), then write one big check on a money market fund to cover the bill at the end of the month, bypassing currency and demand deposits completely. Most people continue to hold some cash and maintain a traditional checking account, but the decline of cash relative to other types of financial instruments has been going on for quite some time.

E-Money Versus Cash

Compared with other financial innovations over the past few decades, E-money has been the most heavily hyped as a near-perfect substitute for cash. In light of such claims, what

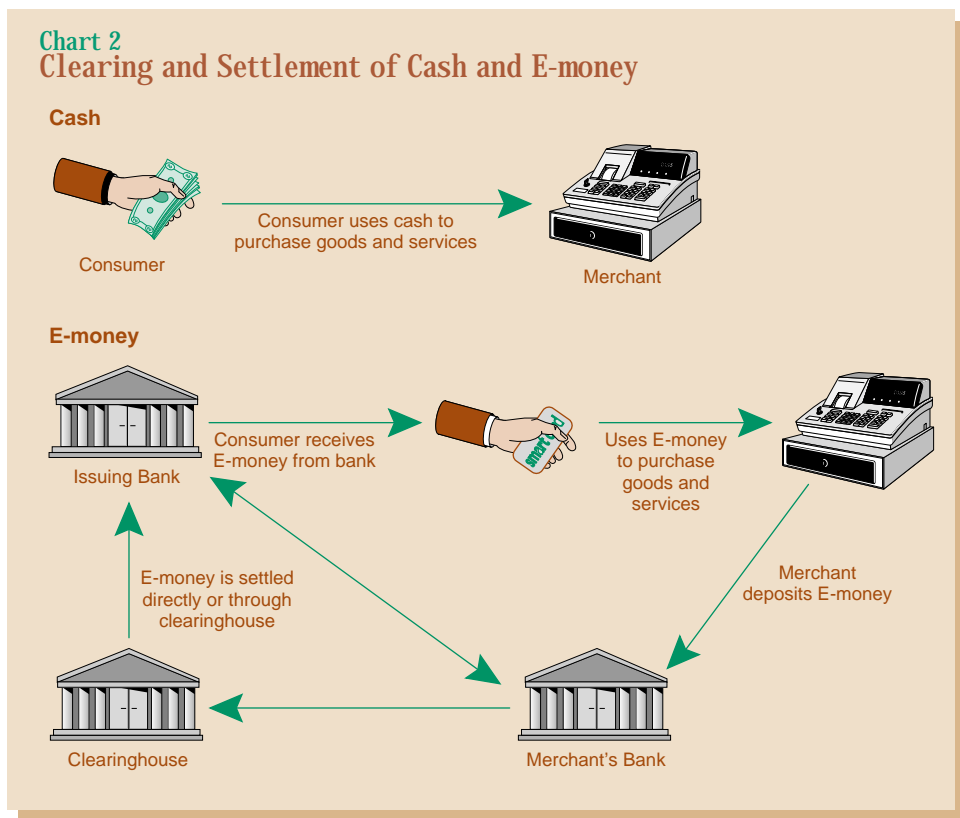
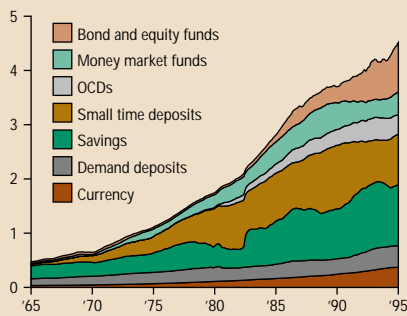


Chart 3
Money Evolves

Trillions of dollars



makes this high-tech means of payment better, or worse, than the good ol' greenback?

On the one hand, proponents of E-money claim it is convenient, fast and clean to use. With special equipment attached to their phones or through their PCs, E-money users can transfer balances onto their stored-value cards without ever leaving home. The point-of-sale terminals that accept E-money result in transactions that are quicker and cleaner than exchanges of cash or a check with a clerk. Perhaps E-money's most appealing feature is the elimination of the need for coins, which inevitably pile up in jars and desk drawers, only to be rolled and exchanged for bills later.

On the other hand, opponents of E-money worry about issues of anonymity, security, counterfeiting and general consumer resistance to changing payment habits. As we would expect in a market economy, institutions that issue E-money provide varying degrees of anonymity and security to appeal to the various wants and desires of their customers. Some institutions offer the ability to replace lost or stolen card balances, as with traveler's checks. Other institutions appeal to consumers more concerned with anonymity by offering electronic money that, once it has been downloaded onto the card and balances are transferred from the individual's to the institution's account, cannot be "matched" to the account from which it originated. As far as the risk of counterfeiting is concerned, the developers of E-money have invested vast resources in sophisticated encryption techniques and security systems, but the

potential for fraud will remain unclear until large amounts of E-money are circulating in the economy.

The issue of whether E-money is easier to use and more convenient than other instruments for making payment will ultimately be decided by the wants and needs of the individual consumer. However, the overall convenience of E-money *vis-à-vis* other types of payment is evident in this scenario. Suppose that when shopping at your local supermarket, you have a choice of five checkout lines. The first line accepts only checks, the second credit cards, the third debit cards, the fourth cash and the fifth E-money. Which line is likely to move the most quickly? Given that checks must be written and presented with identification, that line would surely move most slowly. Credit cards are faster than checks but still require approval by the issuing institution and a signature from the consumer. Although using cash, debit cards and E-money is obviously quicker than using checks and credit cards, comparing the ease of transactions among those three alternatives is more difficult. Cash requires only that change be made if necessary. Paying with debit cards or E-money is simply a matter of swiping a card and confirming the amount. Cash, debit cards and E-money appear to be almost equivalent in terms of the time involved in making a transaction.

Regardless of the relative merits of E-money, consumer indifference—and even resistance—to adopting a new payment instrument will be a strong obstacle to overcome. The tendency of consumers to maintain payment habits is evident in the large number of checks they continue to write, despite the obvious advantage of the interest-free loan that credit cards offer when paid off in full at the end of the month. E-money will never offer sufficient advantages over currency to induce some individuals to change their habits, especially people who want absolute anonymity.

Consumer acceptance is crucial to the success of E-money, but the consumer is only part of the picture when it comes to transactions in the marketplace. Merchants play an equal, if not greater, role in the development of any means of payment. Lest we underesti-

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mate the importance of merchant acceptance, recall the advent of credit cards. The BankAmericard and Master-Charge card were introduced in the United States in the mid-1960s. But according to an article that appeared in *Life* magazine in 1970, "bank cards still encounter areas of resistance. Most big department stores refuse to honor them....Restaurants in many places will have no part of them." Although credit cards were very attractive to consumers from the outset, the widespread use of credit cards was delayed by a lack of acceptance by merchants. If E-money is to succeed, it must prove its merits not only to the consumer but also to the retail community.

From a merchant point of view, the most promising aspect of E-money is the potential for substantial cost savings. It has been estimated that approximately 4 percent of the total value of a transaction made with currency is tied up in the counting, storing and protecting of that cash. Merchants are likely to be charged a fee for E-money transactions, as they are with credit cards, but electronic money may be slightly cheaper and easier for merchants to handle than cash. If so, merchants could offer in-

centives to induce consumers to use E-money rather than cash.

Free Enterprise and E-Money

In a free enterprise system, innovations survive and flourish if the net benefit to users from a new product or service is greater than what existing substitutes offer. E-money is no exception. Should consumers and merchants fail to find the merits of electronic money sufficient to overcome any costs associated with its use, E-money could very well go the way of the Edsel.

The Federal Reserve to date has refrained from imposing regulations on electronic money (aside from the boundaries established by Regulation E) in favor of allowing the innovation to develop in a relatively unfettered market environment. The issuers of E-money do not expect individuals to hold relatively large balances on stored-value cards. So long as individual balances remain small, the potential failure of institutions that issue E-money poses no significant risk to consumers. Government intervention, therefore, appears unwarranted. In the absence of regula-

tion, the reputation of the issuing institution will be vital to the acceptance of its E-money. Should consumers and merchants doubt the safety and soundness of the institutions issuing E-money, they always have a near-perfect substitute to fall back on: currency.

—Marci Rossell

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A TALE OF THREE SUPPLY SHOCKS, NATIONAL INFLATION AND THE REGION'S ECONOMY

(continued from page 4)

Notes

I thank Jeremy Nalewaik and Sheila Dolmas for research assistance, and Lori Taylor, D'Ann Petersen, Michelle Burchfiel, Fiona Sigalla and Mine Yücel for comments and suggestions.

¹ Supply shocks are changes in technology (for example, computers), industrial structure (for example, health care) or world resource prices (for example, energy) that alter an industry's cost schedule and thereby cause substantial changes in its relative price.

² See John V. Duca, "Inflation, Unemployment, and Duration," *Economics Letters* 52 (September 1996): 293–98.

³ For example, see Felix G. Rohatyn, "Recipe for Growth," *Wall Street Journal*, April 11, 1996, A21.

⁴ For example, see Jeffrey C. Fuhrer, "The Phillips Curve Is Alive and Well," *New England Economic Review*, March/April 1995, 41–56.

⁵ For an analysis of trimmed mean CPI measures, see Stephen G. Cecchetti, "Measuring Short-Run Inflation for Central Bankers," Federal Reserve Bank of St. Louis *Review* (forthcoming).

⁶ The trimmed mean CPI can still be affected by changing supply conditions. For example, medical inflation shifted from being a high outlier excluded from the trimmed mean during much of the 1980s and early 1990s to being more in line with the pace of price rises in other items.

⁷ For further discussion, see Sheila Dolmas and Mine Yücel, "The Texas Economy: An Overview of '96 and Outlook for '97," *Southwest Economy*, Issue 1, January/February 1997, 1–4.

⁸ Data are based on the work of Dolmas and Yücel (1997). Note that because the book-to-bill ratio in Chart 4 is measured quarterly, whereas job growth is measured on a year-over-year basis, by construction the plotted job growth series will tend to lag the book-to-bill ratio.

⁹ Note that the domestic book-to-bill ratio does not reflect the role of foreign demand. In addition, because the

ratio is based on nominal data, a spurt in computer price deflation will tend to lower this ratio because new orders reflect more recent and thus lower prices than shipments.

¹⁰ See D'Ann M. Petersen and Michelle Thomas, "From Crude Oil to Computer Chips: How Technology Is Changing the Texas Economy," *Southwest Economy*, Issue 6, 1995, 1–5.

¹¹ For an analysis of District energy jobs and oil prices, see Stephen P. A. Brown and Mine K. Yücel, "The Energy Industry: Past, Present and Future," *Southwest Economy*, Issue 4, 1995, 1–5.

¹² Nevertheless, this ratio could overstate the impact of health care restructuring because it excludes health care workers in the public sector and because health care workers in the private sector likely have been more affected by cost-cutting and mergers.

¹³ This measure is the cleanest aggregate measure of final computer goods prices that covers at least two decades. By contrast, the producer price index for the "electronic computers" category begins in 1990, and the CPI's home furnishings component blends computers with other items.

¹⁴ See Elizabeth Kilbreth and Alan B. Cohen, "Strategic Choices for Cost Containment under a Reformed U.S. Health Care System," *Inquiry* 30 (Winter 1993): 372–88; J. P. Newhouse, W. B. Schwartz, A. P. Williams and C. Witsberger, "Are Fee-for-Service Costs Increasing Faster than HMO Costs?" *Medical Care* 23 (August 1985): 960–66; and Linda Radey and Richard Fullenbaum, "Are Employers' Health Benefit Costs Finally Under Control?" *Review of the U.S. Economy: Ten Year Projections* (Lexington, Mass.: DRI McGraw-Hill, 1995), 51–3.

¹⁵ For details, see Millt Freudenheim, "Health Care Costs Edging Up and a Bigger Surge Is Feared," *New York Times*, January 21, 1997, national edition, A1 and C20; and Ron Winslow, "Health-Care Costs May Be Heading Up Again," *Wall Street Journal*, January 21, 1997, B1 and B6.