

Policy Issues Raised by Electronic Money

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We see more and more articles in the newspapers and trade journals about the coming of electronic money. What the press often fails to note is that, in terms of dollar volume, most transactions made in this country already are completed with electronic messages. Each day two trillion dollars of funds transfers are electronically transmitted over two systems -- Fedwire and CHIPS. These systems handle large dollar, interbank payments primarily related to financial transactions. The reserve base serves as the medium of exchange for these transactions either on a gross or net basis.

But the recent media attention concerns something different -- the potential for electronic payments to displace physical currency, check, and credit card transactions. One possible substitute for these payments media, particularly for currency, is the open-system, stored value card, a smart card onto which funds can be downloaded from a consumer's checking account. Consumers could then use the card, the size of an ordinary credit card, for small-dollar, high volume transactions at a variety of locations. The earliest applications will probably be the ones for which having exact change at the site of the transactions is a true convenience, such as vending machines, pay telephones, transit fares, tolls, and fast foods.

In addition to using prepaid cards as a convenient instrument for making in-person payments, consumers may soon have the option of making purchases over computer networks. These payments could be

facilitated, for example, by connecting a device containing a stored value chip to the consumer's computer. The overall effect would be similar to catalog shopping as we now know it, except the merchandise for sale would be displayed electronically, ordered electronically, paid for electronically, and, in the case of information-based merchandise, even delivered electronically. These "catalog transactions" would have been made with checks or credit cards in the past. Most check and credit card payments presently flow through the banking system. Electronic payments over nonbank networks, therefore, would tend to disintermediate these transactions.

This paper reviews a number of policy issues raised by the emerging electronic payments media for the consumer sector. These can be broken down into three broad categories: (1) consumer interest (Regulation E, privacy, escheatment, deposit insurance and low-income access), (2) criminal activity (counterfeiting and money laundering), and (3) monetary policy (reserve requirements, definitions of money, seignorage, and the appropriate limitations on the types of institutions that could issue electronic money). In covering these issues, we will distinguish, when necessary, between payments made by prepaid cards and those executed over electronic networks. Business groups may also establish electronic payment networks to facilitate payments among suppliers, manufacturers and retail outlets. In this paper, however, we

will confine our discussion to the consumer sector. The paper begins with a background discussion of the value flows in these electronic payment systems that will help to highlight the policy issues. The subsequent three sections discuss the three sets of policy issues mentioned above.

I. **BACKGROUND**

Before beginning our discussion of the policy issues raised by electronic money, it will be useful to compare the value flows between currency and prepaid cards on the one hand, and between prepaid cards and computer networks on the other. The differences and similarities in the value flows will highlight some of the key policy issues.

Chart 1 shows the value flows that occur when a consumer withdraws funds from his bank account either as cash or as value added to a prepaid card. These two types of withdrawals affect on a bank's balance sheet in different ways. A cash withdrawal reduces the bank's assets (vault cash) and its liabilities (demand deposits) by an equal amount. Because the reduction in vault cash constitutes a dollar-for-dollar reduction in reserves, while the lower level of demand deposits reduces required reserves by just 10 percent (the current reserve ratio), the bank will need to acquire additional reserves. A withdrawal onto a prepaid card, in contrast, merely substitutes one bank liability for

another -- a prepaid card liability for a demand deposit liability. Thus, the transaction will have no implications for the bank's reserve management operations provided that both liabilities are subject to the same reserve requirements.

From the consumer's perspective, as well, there is a conceptual difference between the two types of withdrawal. In each case, the value leaves a government insured demand deposit. With the currency withdrawal, however, the consumer receives legal tender for all transactions issued by the Federal Reserve and backed by its holdings of Government securities. The value on the bank issued prepaid card, in contrast, is not legal tender for all transactions. It is not directly backed by government securities, but by the issuer to honor its value. In some ways, prepaid cards are similar to the bank notes that circulated in the mid-1800s -- a medium of exchange issued by banks as opposed to the government. If the balances on the bank issued prepaid cards were covered by FDIC deposit insurance, however, this value would be more equivalent to currency because it would ultimately be backed by the U.S. government.

Next consider the perspective of the merchant. When accepting a cash payment, a merchant must take reasonable care not to accept counterfeit bills since his bank will refuse to accept it for deposit. In contrast, the value of payments made by prepaid cards accumulates in a

card reader provided to the merchant by his bank. Once the bank's card reader accepts the card as valid, the transferred value becomes the bank's liability to the merchant, and the merchant need not be concerned as to whether the card was counterfeit -- card security will be the responsibility of the issuing banks.

When the merchant finally deposits his cash proceeds in his bank, the bank experiences a simultaneous increase in assets (vault cash) and in demand deposit liabilities. Because the bank's required reserves rise by only the amount of the reserve ratio multiplied by the increase in deposits, the currency deposit creates excess reserves. When the merchant deposits prepaid card value, however, the bank merely substitutes one liability (a demand deposit) for another (prepaid card), with no reserve management implications if both liabilities are reservable at the same rate.

If a bank has excess vault cash or a shortfall in vault cash, it returns to, or obtains currency from, the Federal Reserve. If, on the other hand, a bank receives more (less) prepaid card value from merchants than it issued, it will need to refund (receive) prepaid card value to (from) the other banks. Hence, prepaid cards systems would also require a mechanism for clearing and settlement.

Chart 2 displays a value-flow diagram for bank-issued prepaid cards and nonbank value on computers linked through a nonbank

network.¹ The left side of the second chart is similar to the right side of the first chart. A consumer transfers value from his bank account to his prepaid card and engages in transactions through which value accumulates on the merchant's card reader. Eventually, part of the value returns to the banking system as the merchant deposits the value in his bank account. Value still outstanding at the end of the banking day, either on prepaid cards or merchants' card readers, represents a noninterest bearing liability of the banking system.

The right side of the chart shows the value flows for nonbank issued value on computers linked through a nonbank network. The consumer withdraws funds from his checking account and purchases value on the network, that is, the network operator credits the stored value chip on the consumer's computer with value transferable over the network by computer-entered instructions. The consumer makes transactions and the value accumulates in the merchant's stored value chip. The merchant can either return the value to his checking account or retain it on the network to make payments to his suppliers. The value that is not returned to the banking system represents: (1) float the network operator can invest, and (2) a funding need for the banking

¹Prepaid cards and card readers could also be viewed as a "network" in the sense that they are a set of compatible devices that can recognize one another as valid members of the system and pass secured value. It is also possible that nonbanks could issue value on prepaid cards and that banks could issue value over computer networks. To illustrate the policy issues, however, we are assuming just two distinct cases: (1) bank issued value on prepaid cards, and (2) nonbank issued value on a computer network.

system.² Since the value on the network is the exclusive liability of the network operator, there would be no need for clearing and settlement. Excess value obtained by merchants could be returned to the network operator for a refund; consumers could purchase additional value from the network operator as needed.

These two payment systems are similar in some respects. Prepaid cards and card readers are functionally equivalent to the computer network. That is, each represents a mechanism by which electronic payments can be made independent of bank accounts. Also, in each system, value must be: (1) securely moved from the bank account to the transaction vehicle, (2) securely maintained while transactions are made, and (3) securely returned to the banking system. As long as participants believe that the electronic money in either system can be withdrawn and deposited for full value at a bank, the systems should be viable. Consumers and merchants might feel more secure if the value

²In this case, banks have been excluded by assumption as being the issuers of the value on the network. It is, of course, possible that banks would issue the value transferred over the network, in which case the value in the network would remain a bank liability. Even if the value on the network were bank issued, the transactions processing would still be disintermediated in the sense that the transactions would flow over the network rather than through bank checking accounts. In addition to moving monetary value electronically over networks, some effort is also being made to move credit card information over the networks in a secure way, permitting consumers to charge purchases to their credit card accounts. This process is also referred to at times as "electronic money", but conceptually it is not. It is still a credit card purchase, and the consumer receives a bill for the purchases made on a regular credit card statement in the next billing cycle, just as the consumer would have received a bill for a purchase from a conventional catalog when the credit card number is given over the telephone.

in the system were a liability of the banking system, but as long as a nonbank operator maintained confidence, such a system might also work.

There are, however, also some important differences between the two systems. In the basic prepaid card programs, value flows from the bank, to the cards, to the card readers, and back to the bank. Transactions among consumers and among merchants do not occur, which will probably limit the amount of float in the system. Over a computer network, however, transfers among consumers and among merchants could also occur. This outcome might not only result in a larger volume of float remaining in the network, but could disintermediate a large volume of transactions that previously flowed through the banking system, as either checks or credit card transactions. This later result could also facilitate money laundering, depending on the record keeping capability of the network. In addition, consumers would also be at greater risk in a nonbank network because a nonbank issuer of value would not be subject to the same regulation and supervision as a bank issuer.

In sum, in this first section we have attempted to show where the policy issues might arise in retail electronic payment systems by comparing a conventional currency value flow to a prepaid card flow and, in turn, comparing this later value flow with the operation of a

nonbank network. It would appear that prepaid cards could displace currency, especially for routine, smaller transactions, and that computer networks might substitute for some check and credit card payments. This later outcome, in which transactions are completed over a nonbank network, would disintermediate transactions processing because the transactions would take place independently of bank accounts. In the remainder of this paper we will discuss the policy issues raised by the substitution of electronic money for the conventional means of payments in the consumer sector.

II. CONSUMER ISSUES

Consumer interest issues include protection against fraudulent use under Regulation E, privacy, escheatment, deposit insurance, and access for low income consumers. In this section, we will briefly review the implications of electronic money for each of these.

Regulation E. Regulation E limits the loss consumers can suffer if a lost or stolen ATM or debit card is used fraudulently. Would Regulation E apply to electronic money issued by banks on prepaid cards? Like ATM and debit cards, the prepaid card would serve as an account access device when downloading value from a checking account onto the card. This use would appear to fall under Regulation E. Less clear is whether the regulations would apply when

routine transactions are made: it could be argued that the bank's liability to the consumer has ended, leaving the consumer subject to the same risks posed by carrying cash. The application of Regulation E to a nonbank issuer of value is even less certain. If a consumer used a debit card to transfer value from a checking account to the network operator, Regulation E would probably apply. Since the network operator is assumed in this paper to be a nonbank, it appears even less likely that Regulation E would apply to routine transactions over the network that are conducted with value issued by a nonbank and are completed independently of a bank account.

Consumer Privacy. Nonbank consumer transactions conducted with currency are anonymous. Some analysts are questioning whether electronic money will afford consumers the same level of privacy as currency, or whether these transactions will be recorded and therefore traceable. It may be necessary to record transactions completed with electronic money in order to detect counterfeiting. In that case, banks and network operators will need to be aware of the circumstances under which this information could be released to law enforcement authorities and others.

Escheatment Laws. Issuers of electronic money will also need to deal with state escheatment laws. These laws require that funds in inactive bank accounts revert to the state after a period of time if

depositors or their heirs cannot be found. Will these laws apply to the value on bank issued prepaid cards? Do these laws only apply to banks, or would they also apply to the value held on nonbank networks?

Deposit Insurance. When a consumer withdraws currency from his checking account, he receives legal tender for all transactions issued by the Federal Reserve and backed by its holdings of U.S. government securities. Value issued by a bank on prepaid cards would be the liability of the bank, and the value issued by a network operator would be the liability of a nonbank. The value outstanding on bank issued travelers checks is subject to deposit insurance, protecting the consumer from the failure of an issuing bank. This same logic might be applied to bank issued value on prepaid cards, but what about the liabilities of nonbank network operators? In this later case, consumer protection may be an important issue. Disclosure laws may require banks and nonbanks alike to clearly notify consumers whether the electronic money they issue is covered by deposit insurance. A precedent for this is the notification given concerning bank-sponsored mutual funds.

Access by Lower Income Consumers. The final issue from the consumer-interest perspective would be access to this new technology for lower income consumers. Several government agencies have begun using electronic transfers (direct deposit) to issue benefits. To assist recipients without bank accounts, an agency could set up a master

account at a bank with subaccounts for its beneficiaries. Prepaid cards issued to the beneficiaries would serve both as account access devices and as instruments for making transactions. Rather than cashing a check once a month at a check cashing establishment, often for a high fee, beneficiaries could use their cards to withdraw funds as needed. This arrangement would also reduce their exposure to loss or theft of benefits received.

It is more difficult to anticipate how lower income consumers without checking accounts might participate on networks operated by nonbanks. They would need to develop a way to convert currency to value spendable on the nonbank network. Banks, in contrast, plan to convert cash to value on prepaid cards at their branch locations, thereby giving lower income consumers without checking accounts access to the convenience of prepaid cards.

Another promising step in this direction of assisting consumers without conventional bank accounts is the specialized payment card program offered by two major New York banks. Under this program, each participating employee has a special-purpose account set up on his behalf by his employer, to which his wages are electronically deposited. He can then use his payment card to either withdraw his wages at an ATM, or make purchases at participating retail outlets.

III. CRIMINAL ACTIVITY

In this section, we review two types of criminal activity that might be relevant for electronic money: counterfeiting and money laundering.

Counterfeiting. If criminals learn how to counterfeit the value held on prepaid cards or on nonbank networks, the issuers might suffer heavy losses, thereby undermining the acceptability of these forms of electronic money. Issuers are studying sophisticated cryptographic techniques as well as the periodic recall and replacement of the electronic money outstanding as methods to prevent, detect, and contain fraud. And issuers plan to have independent research labs test these security arrangements before exposing actual value to the potential of counterfeiting.

While the possibility of counterfeiting electronic money is cause for concern, it is not clear that it constitutes a reason for preferring paper money over electronic money. Advances in photocopying and laser printing technology may make it easier to produce high quality counterfeit currency in the future. Hence, it remains an open question whether it will be easier to protect monetary value in a paper or in an electronic environment.

Money Laundering. Currency is used extensively in the underground economy and in illegal activities to evade taxes and the

recording of transactions. Would electronic money contribute to these activities by making it easier to move value undetected? Unrecorded electronic transfers would probably make it easier to move value than is currently the case with relatively bulky currency. But if large transfers of electronic money into bank accounts were reported to authorities, as is now the case for currency, electronic money would not necessarily present more opportunities for fraud than those that now exist with currency. It is possible, however, that value held on an extensive nonbank network could be readily moved to several remote locations and deposited in smaller amounts to avoid detection.

IV. MONETARY POLICY ISSUES

In this final section, we explore some of the monetary policy issues that might be raised by electronic money: reserve requirements, definitions of money, seignorage, and the appropriate limitations on the types of institutions that could issue electronic value.

Reserve Requirements. Consumer transactions deposits are subject to reserve requirements. When a bank issues electronic money, it debits the consumer's checking account and increases its liability for electronic money. In order to keep the offsetting decrease and increase

in liabilities neutral with respect to the demand for reserves, the value for electronic money would need to be subject to the same reserve requirements as consumer transactions deposits.

When the value outstanding is issued by a nonbank, however, the question changes because these issuers fall outside the regulatory framework for banks. Therefore, the liabilities of nonbank network operators would not be reservable, just as their liabilities would not be subject to deposit insurance.

Definitions of Money. The current definitions of the money supply would also need to be reviewed, particularly if electronic money began to substitute for conventional money, currency and balances in consumer checking accounts, to a significant degree. Bank liability for electronic money would be reported to the Federal Reserve and could therefore be readily included in the money supply if deemed appropriate. Value issued by nonbank operators might be more difficult to observe, distorting the accuracy of the reported money supply statistics.

Seignorage. Value issued by banks on prepaid cards could displace a significant amount of the currency used in smaller, routine transactions. If prepaid cards displaced all currency and coins in denominations of \$10 and under, for example, they would substitute for more than half of the physical currency outstanding but less than

13 percent of its dollar value (about \$50 billion). As the currency was retired, the Federal Reserve would need to sell \$50 billion of government securities, thereby foregoing the interest income on the securities it normally turns over to the Treasury. At a 7 percent rate of interest, the sale of securities would cost the Treasury \$3.5 billion in interest income each year. In practice, this \$3.5 billion can be viewed as an upper limit because prepaid cards are only likely to displace a fraction of the smaller denomination currency outstanding. Indeed, the impact of prepaid cards on currency is more likely to take the form of slower growth than an outright reduction.

Value outstanding on a nonbank network would most likely substitute for funds held in consumer checking accounts. Unless network operators paid interest on the value held on the network, consumers would not receive the interest income they had previously earned on their bank deposits. Instead, the network operator would earn interest income by investing the "float" that remained on the network.

Institutional Limitations. The final policy issue is whether there should be limitations on the types of institutions that can issue electronic money. We have assumed thus far that both banks and nonbanks could issue electronic value. A May 1994 report by the Working Group on European Payment Systems, however, proposes that only banks be allowed to issue electronic money in the form of prepaid

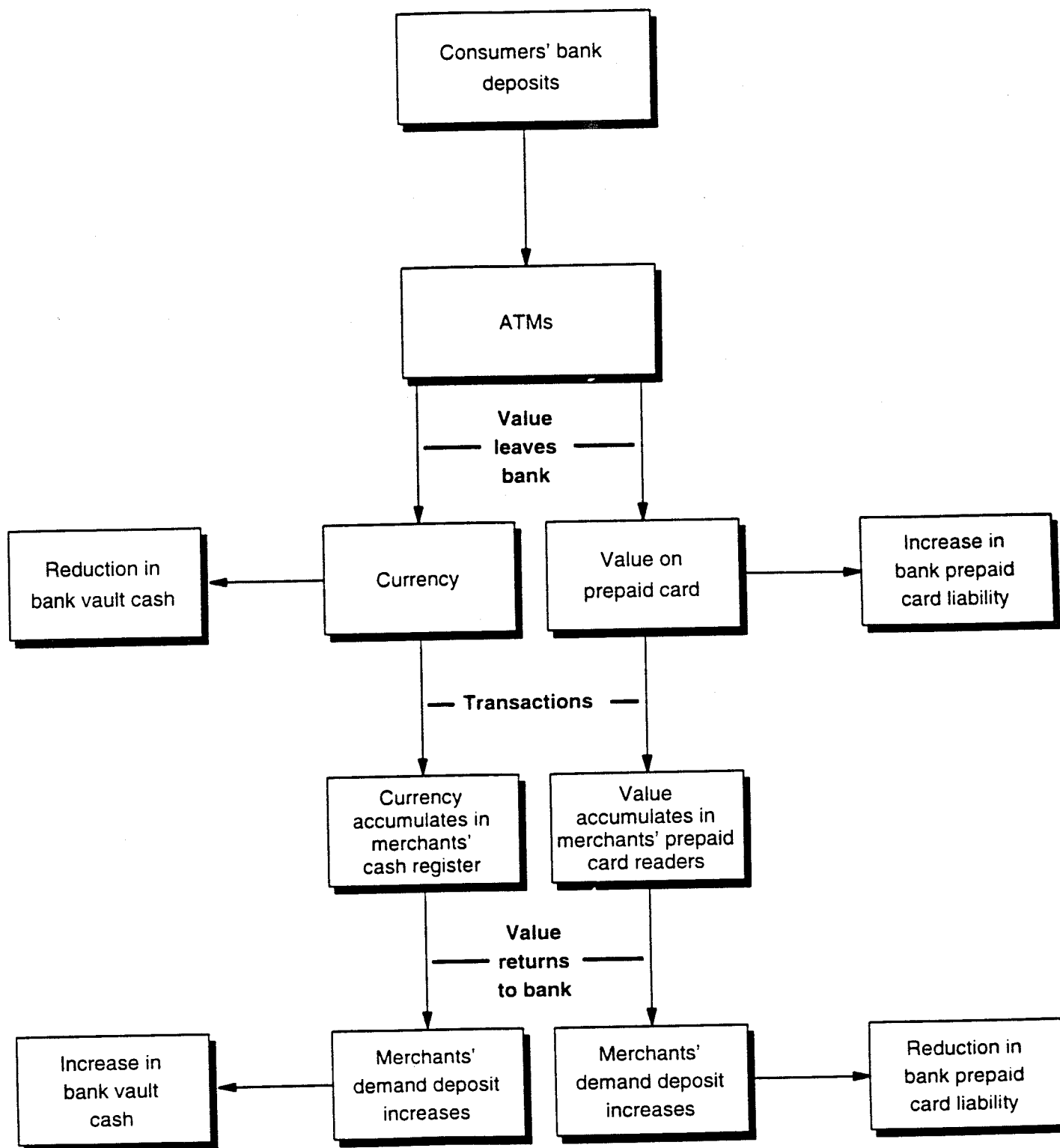
cards. The report did not address the broader question of electronic money issued on nonbanks networks. In any case, the report notes that value issued on prepaid cards by nonbanks would not be subject to the same banking regulations, supervision, and deposit insurance schemes that have traditionally protected consumers. This distinction is important because without such protection, the failure of an electronic money issuer could lead to a run on other issuers and undermine public confidence in electronic money more generally.

V. CONCLUSION

This paper has outlined some of ~~the~~ policy issues that electronic money could raise if it develops to the point where it is used ~~extensively for transactions~~ in the consumer sector. It is still too early to know, however, just how popular electronic money will become and, therefore, what challenges it could raise for policymakers.

COMPARISON OF VALUE FLOWS

Currency and Prepaid Cards



COMPARISON OF ELECTRONIC CASH

Prepaid Cards Versus Electronic Networks

