

Public Policy Considerations in View of The Payments System as a Network

I'm sure you are aware of the abundant publicity surrounding many of the new electronic payments options emerging today. Stored value cards and payments processed over the Internet are a few that come quickly to mind. But as Elliott McEntee has just shared with us, electronic payments are hardly new; large dollar systems like Fedwire and CHIPS have been carrying the bulk of all payments value in this country, safely and efficiently, for many years.

So, why all the excitement -- especially when we find that these new systems, which are designed to move primarily small-dollar payments, presently account for only a fraction of the estimated 400 billion payments transactions made in the United States annually?

And, why all the excitement -- when the shifts to these new electronic payment arrangements appears so limited today and their ultimate acceptance by the public is uncertain at best?

One answer may be that what we are seeing is the beginning of a true revolution in the payments system as we know it. The vast amount of experimentation and innovation involving electronic payment and the emergence of new forms of alliances between traditional payments players, such as banks, and non-traditional

convert their closed systems into an open system. The payments services of a bank that refuses to participate in the open system will be less valuable to depositors.

Restrictions on the transactions in these parallel closed systems could be removed through a merger of these banks, as depicted in figure 3. However, a merger could lead to less than optimal outcomes for participants because it removes competition among banks. Another alternative, is the creation of an open payments system, as shown in figure 4, in which the customers of each bank can make payments to the customers of any other bank. Such an open system is in the interest of the users of payment services, since they can use their transactions accounts for paying customers of other banks, and they can choose among alternative banks as providers of payment services.

The shift from a closed to an open system creates the need for arrangements for settlement of cash payments among banks. And, in reviewing the implications of this kind of change in the payments system, a natural starting place for policymakers is examination of issues related to systemic risk. That is, the risk that default on obligations by one provider of payments services will cause defaults by others, resulting in a chain reaction of defaults. Analysis of such risk generally focuses on the operation of large-value payments systems, since it would take a relatively large default to set off such a chain reaction of defaults by banks.

In the analysis of systemic risk in large-value payment systems, the shock that may have systemic effects is a default by a major bank. In my discussion today I focus on a different aspect of systemic risk, in which the shock that disrupts a component of the payment system is a disruption in the arrangement for settlement among banks. A breakdown in settlement arrangements could disrupt the provision of payment services to end users for various components of the system, including households that had initiated small-value payments. If a breakdown prevents settlement of cash payments among the firms that provide payment services, each firm might stop accepting payment obligations drawn on the other firms. This possibility stresses that the design of settlement arrangements among firms in a payments system is central to the safety and soundness of the system.

Revisiting our earlier example of a closed system (figure 1) we can see that such a system has no settlement risk because its settlement arrangements are self-contained. However, as we move to an open system (figure 4), the risk related to settlement becomes apparent because customer payments create imbalances among participating banks, with some banks having obligations to pay cash to the other banks. Therefore, banks must establish a mechanism for settling among themselves, because the productive operation of this open system depends on the uninterrupted flow of payments among the banks.

The settlement arrangement that minimizes transaction costs to banks is illustrated in figure 5. This arrangement includes the services of a settlement agent — perhaps another private bank or possibly the central bank. Let's take a look at how the settlement agent works: Figure 6 shows that payments among bank customers on a given day generate net obligations for Bank A to pay Banks B and C. Bank A pays the settlement agent, and the settlement agent, in turn, distributes the cash to Banks B and C. Settlement of net interbank payments through a settlement agent minimizes the flow of cash among the three banks and therefore minimizes transaction costs to these participants. Important components of the payments system, including credit card systems and ATM networks, use such arrangements for settlement through private banks.

Disruption in a networked settlement arrangement could result from technical problems that disrupt the flow of interbank cash payments, or insolvency of the settlement agent. The effects of these disruptions would depend on various characteristics of the payments systems and the banks in their membership: first, the speed with which banks could reestablish settlement arrangements; second, the willingness of banks to assume risk by crediting the accounts of their depositors for payment orders drawn on other banks while they are still unable to receive payment from those banks; and third, the options available to banks to deal with temporary liquidity problems during this interruption.

To illustrate, we can consider the choices of Bank B after a breakdown in the settlement arrangement (figure 7). While the interbank settlement arrangement functioned smoothly, merchants who used the services of Bank B accepted payment orders from the customers of Bank A in payment for goods and services, since Bank B credited their accounts for payment orders drawn on Bank A.

Question: Will Bank B continue to credit the accounts of its depositors for payment orders drawn on Bank A if Bank B cannot receive payment from Bank A? If so, where will Bank B receive the cash necessary to cover any shortfall in its own cash balance?

To make the illustration more specific, let's consider an open payments system that involves the members of a national credit card association, for which the settlement agent is a private bank. What happens if the settlement agent fails and the card association has no backup arrangement for settling payments among its members? The credit card association could establish another settlement arrangement at another private bank, but that would take some time. In the interim, would members of the national credit card association continue to accept credit card payments deposited by their merchant customers? Most likely they would, and for two reasons: First, since any disruption in the acceptance of the credit card by merchants would do permanent, substantial damage to the public perception of the card, members of the card association would be willing to assume some risk in maintaining the use of the card for payments. Second, since

members of the credit card association are banks, one of their options for dealing with any temporary liquidity problems includes borrowing at the Federal Reserve discount window.

This conclusion probably would apply to members of a large regional ATM network, as well. Banks in the network have incentive to prevent an interruption in the operation of the network, and as banks, they have access to the discount window.

Suppose, in contrast, an open payments system involved stored-value cards issued by new entrants to the payments system that are not chartered as depository institutions. In this new network, would members be willing to assume the same level of risk in preserving uninterrupted acceptance of the card that the members in the preceding examples assumed? Perhaps, but members of this stored-value card system would not necessarily be supervised or have access to the discount window. And, what would otherwise be a temporary liquidity problem for member banks could expose this nonbank organization to a breakdown in its settlement arrangement.

Is this scenario for disruption in the operation of a stored-value card system relevant for public policy? The answer is yes, if such systems grow to account for such a large share of payments that disruption in the systems would disrupt

economic activity, or undermine public confidence in similar payments systems.

As I related at the outset of this presentation, the emerging payments mechanisms that are getting so much attention right now are basically in their infancy.

Consequently, it is difficult to consider the probability that any of these schemes could impose significant risk to the stability of the nation's payments system anytime soon. However, when we consider trends in technology, such as the fact that computing power has doubled every year over the last three decades, I would argue that now is the time for policymakers to consider arrangements that will enhance the stability of the payments system as it continues to evolve in response to changing technology and market forces.

As policymakers, we should also be mindful of the tendency of networks to gravitate toward open systems, and we should not ignore the speed with which change can occur. The growth of ATM networks indicates that once the public accepts a new payments service, large open networks can develop rapidly, bringing with them the advantages and problems of strong network effects.

When we view the payments system in this way, changing and emerging payments arrangements present issues very relevant to public policymakers.

And, for this reason, I believe the following possibilities are relevant for consideration in the public policy arena:

First, require providers of payment services to obtain charters as depository institutions and submit to supervision and regulation by government agencies. This action would serve to minimize systemic risk by ensuring adequate access to the discount window. I would also emphasize that it is not necessary to impose this requirement on all of the new entrants to the payments business at this time. Stored value card systems and payments over the Internet are in various stages of research and development, and hastening to impose a regulatory framework too early could stifle important innovation. The requirement to obtain charters as depository institutions would be relevant for firms that become successful in processing large volumes of payments.

Second, establish procedures for review of the settlement arrangements of private payments systems to ensure that sufficient risk controls and backup settlement arrangements are in place. As we know, the efficient and dependable operation of the payments system is critical to a soundly functioning economy. Public interest demands that appropriate mechanisms exist to ensure some level of review of new entrants to the payments system.

And third, the Reserve Banks can help minimize the vulnerability of payments systems to disruption by providing net settlement services. For

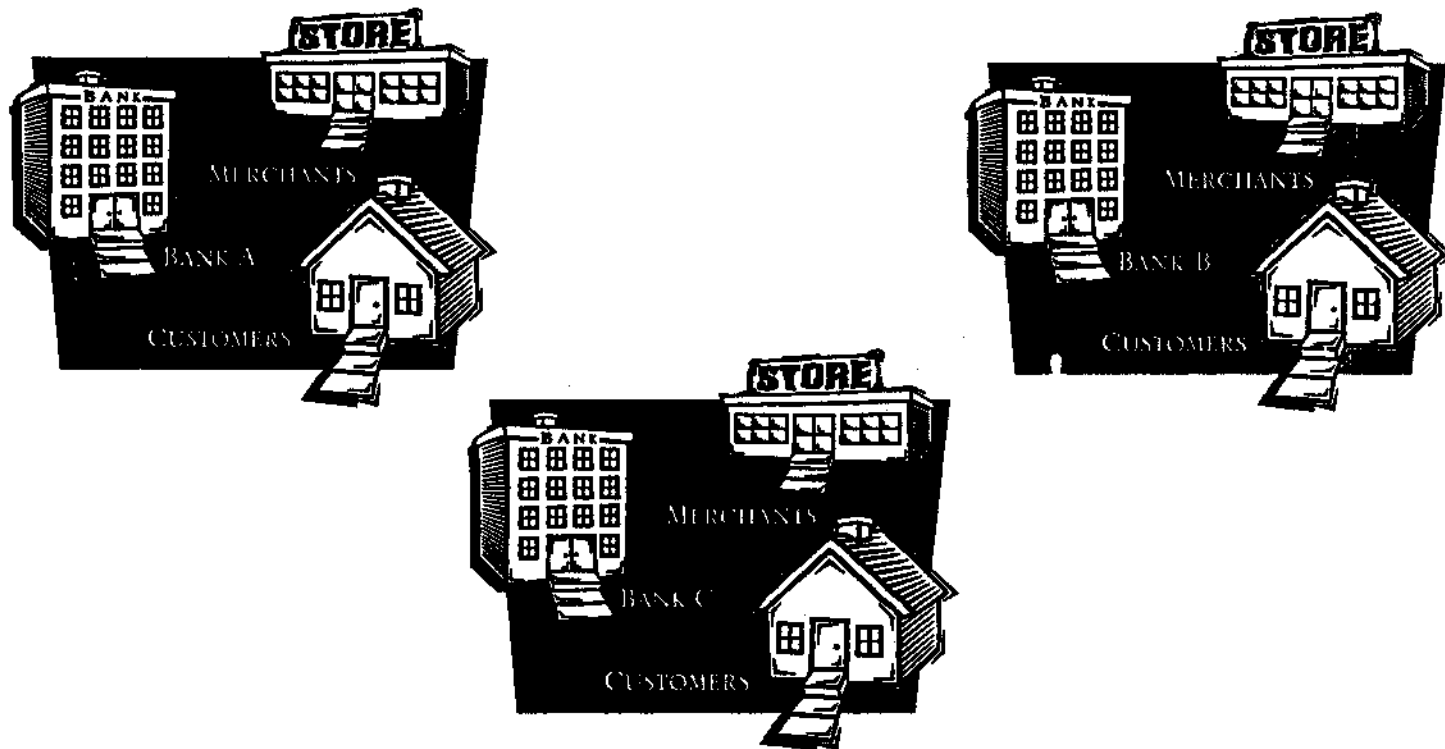
purposes of ensuring the safety and soundness of the payments system, the net settlement services of the Reserve Banks have many advantages over settlement through private banks. The Reserve Banks will not go bankrupt. In addition, they have invested heavily in the reliability of System facilities for computing and communications. On the other hand, cost and/or service features of private arrangements may be more attractive.

In summary, payments systems function as networks; consequently there is strong incentive for participants in payments arrangements to move from a closed to an open system. However, such systems are vulnerable to disruption resulting from breakdowns in arrangements for settlement among the providers of payment services. Paramount to a sound and productive economy is a sound and productive payments system. This is why I believe it is vitally important for policymakers to consider the network effects of the payments system when attempting to gauge the impact that today's emerging technologies may have on the nation's payments system tomorrow.

Thank you.

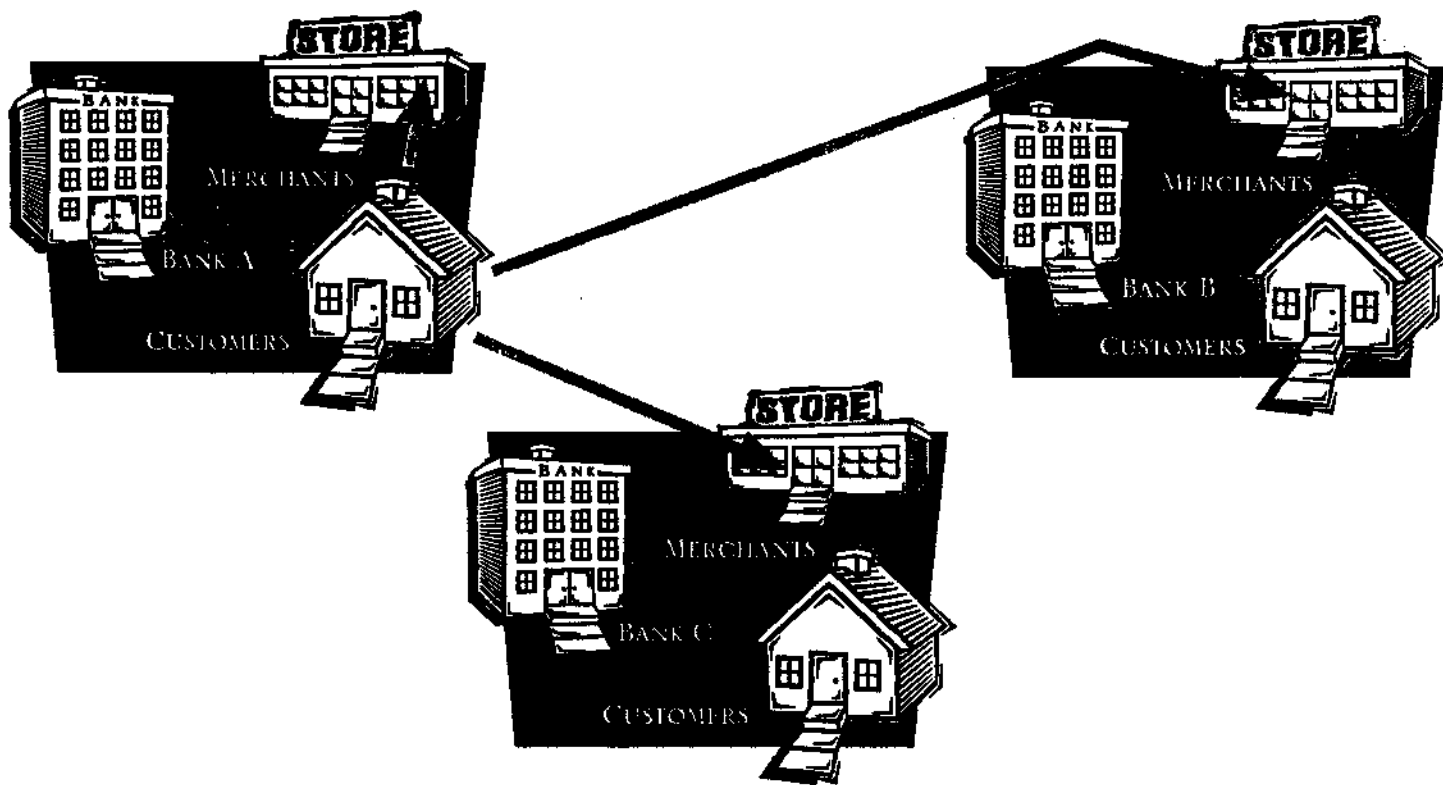
-FIGURE 1-

PARALLEL CLOSED PAYMENTS SYSTEMS



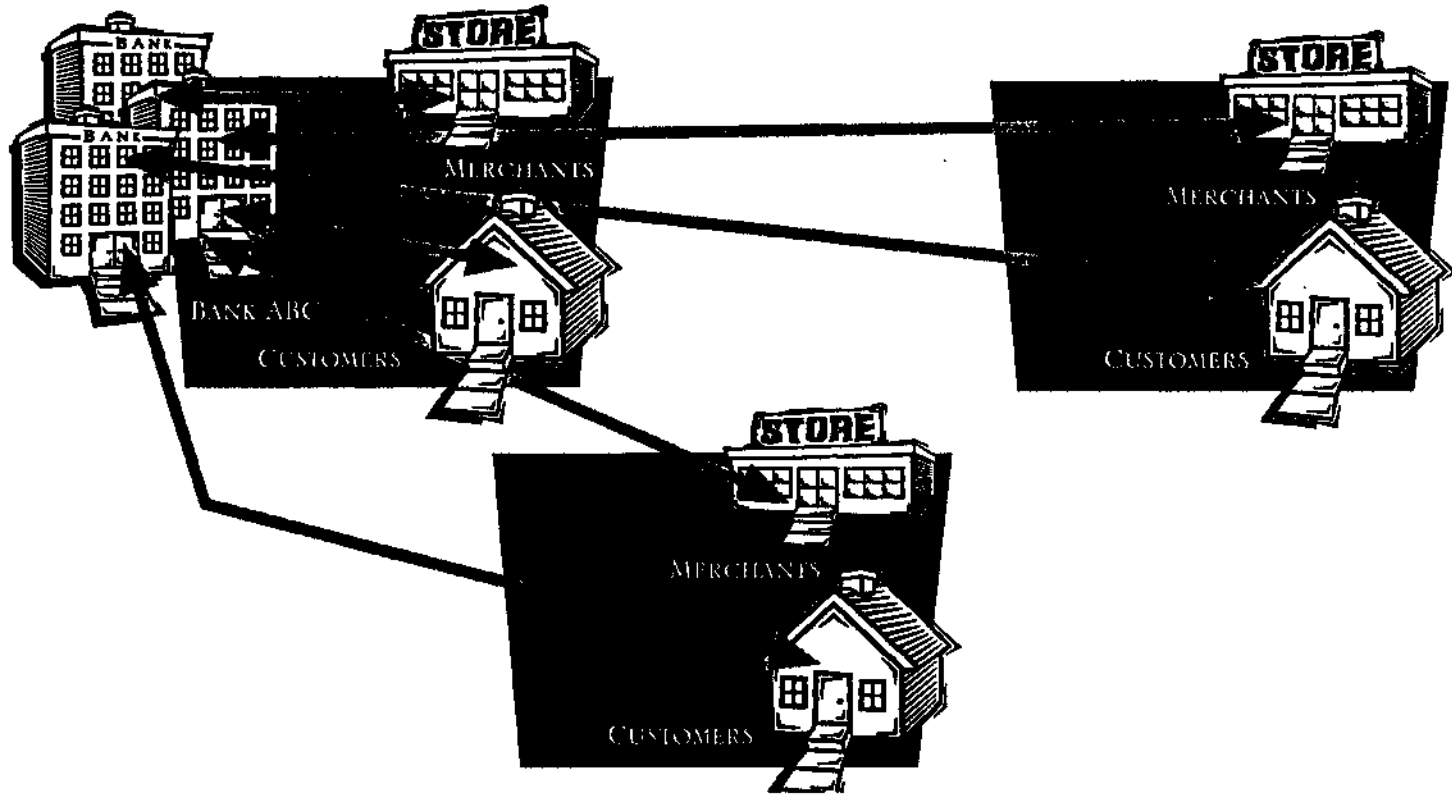
-FIGURE 2-

OPENING THE PAYMENTS SYSTEM



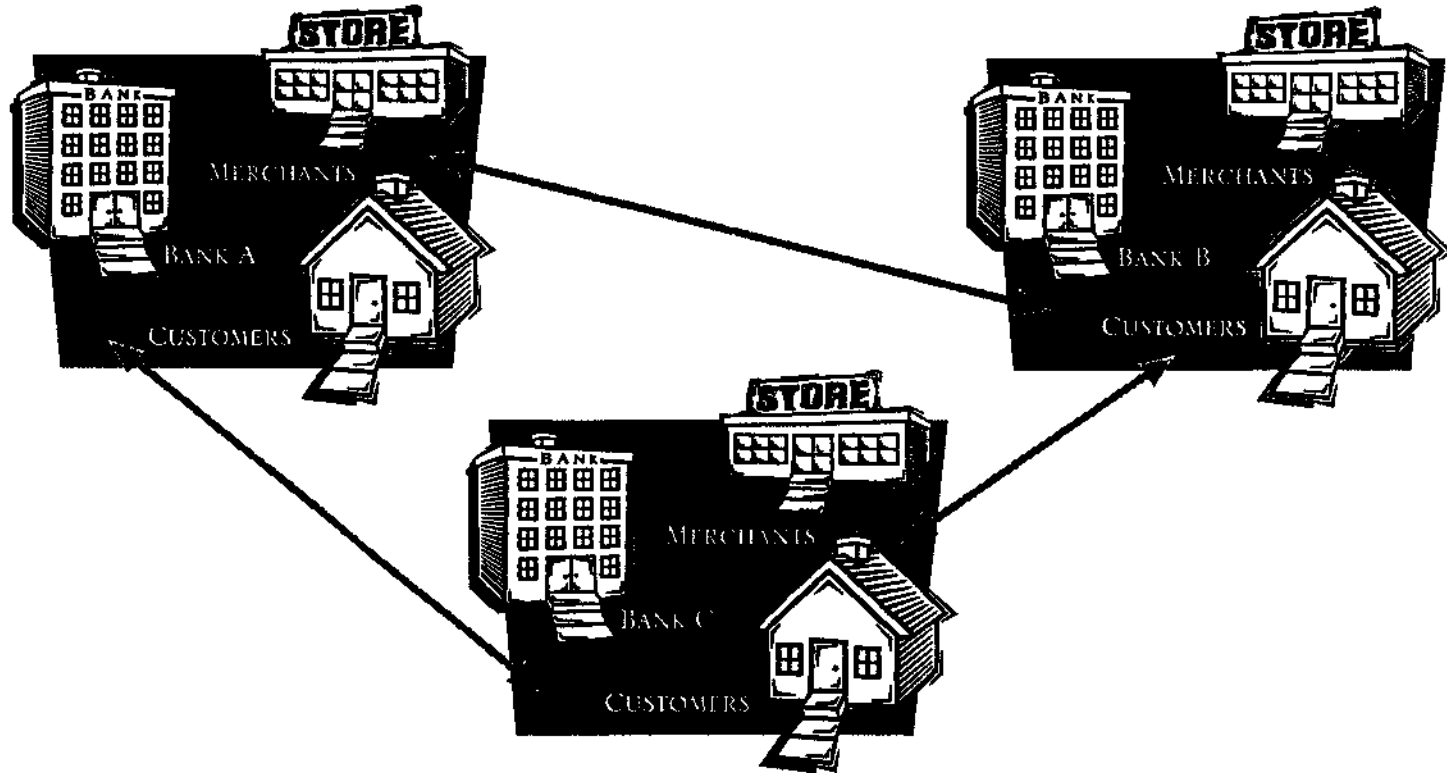
-FIGURE 3-

MERGER: PAYMENTS SYSTEM MONOPOLY



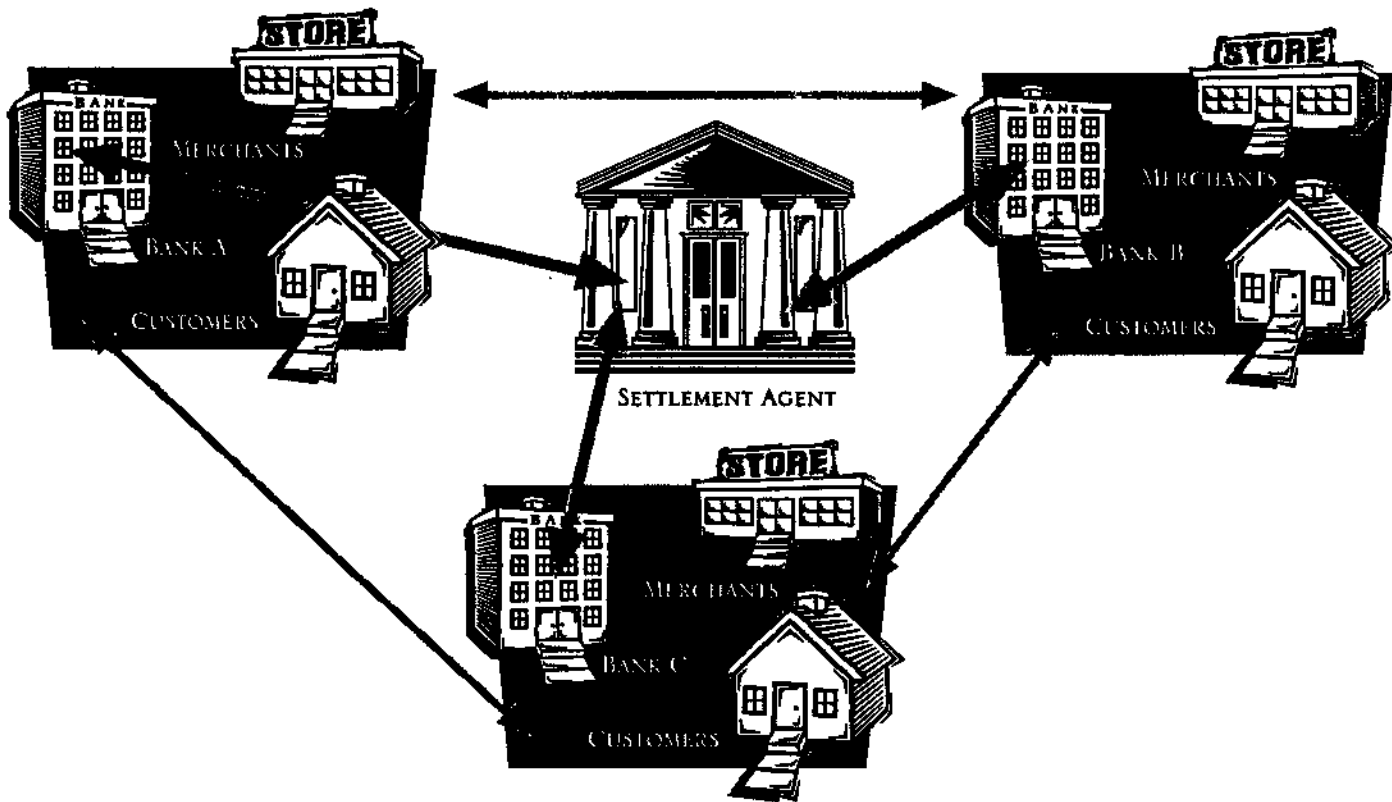
-FIGURE 4-

OPEN PAYMENTS SYSTEM



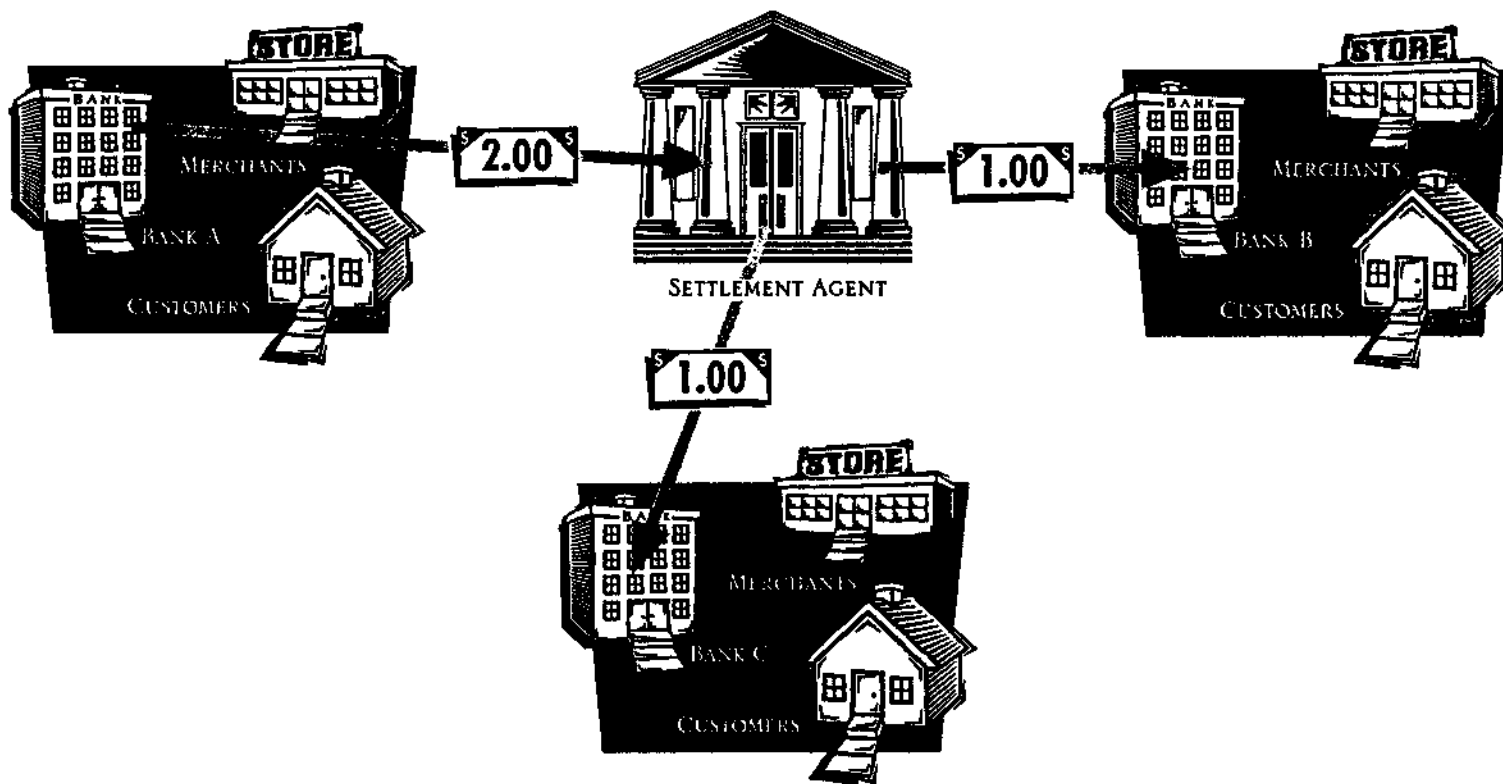
-FIGURE 5-

OPEN PAYMENTS SYSTEM WITH SETTLEMENT AGENT



-FIGURE 6-

FLOW OF CASH THROUGH SETTLEMENT AGENT



-FIGURE 7-

DISRUPTION IN THE SETTLEMENT SYSTEM

