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**“Electronic Money, Inflation and the Role of the Fed
in the Payments System”**

**Remarks by
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**Murray State University
Banking and the Internet Seminar
Lodge at Kentucky Lake Dam Village**

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I am pleased to be in Kentucky in connection with Murray State University's seminar, "Banking and the Internet." This topic is timely, as technology is now having a major impact on money and banking, just as it is in other fields. I'm sure all of you have learned quite a bit today about what banking capabilities currently are on the Internet, as well as what we might expect in the future.

I would like to take a few moments to add a central banker's perspective to the discussion. As you know, the central bank's monetary policies largely determine the inflation rate, at least in the long run. Private-sector forecasters generally expect the 3 percent annual inflation rate we've seen in the 1990s to persist indefinitely. While this is certainly much better than our experience in the 1970s and 1980s, 3 percent annual inflation is not price stability, which is the Fed's long-term goal.

My principal focus today, however, will not be on how monetary policy affects inflation, but on how inflation affects the payments system. I hope to convince you that inflation—even the relatively low inflation that we have experienced recently—reduces the overall efficiency of our payments system. And since the Federal Reserve is charged with overseeing the system's integrity and efficiency, this connection should be worrisome to us.

How can 3 percent inflation harm the payments system, and why is this a relevant topic for a group gathered to ponder electronic money? Inflation affects the payments system by distorting private incentives so that payments are carried out in ways that are socially costly. This is because inflation can drive a wedge between private benefits and the actual cost to society of using a particular payment form. As I will explain in a few moments, inflation may prove to be particularly important for some of the newly

developed types of electronic money and payment. Technological advances have made it more cost-effective for some parties to exploit inflation, even though we as a society may be worse off as a result. This is because valuable resources are being devoted to activities whose primary purpose is to win the zero-sum game that inflation creates.

Before I get down to specifics, though, let me give you a preview of the two main points I want to make this evening. First, I will consider the question whether new forms of electronic money will fundamentally alter the central bank's role in the payments system, potentially compromising its ability to conduct monetary policy. And second, I want to reiterate and expand on the point that inflation interferes with the payments system. My focus will be on certain new forms of electronic money and payments.

Electronic Money, the Federal Reserve and Monetary Policy

Can the Fed continue to carry out monetary policy effectively in the presence of new forms of electronic money? I believe that nothing on the electronic money horizon fundamentally changes the task facing monetary policymakers. This is despite the fact that the details and implementation of monetary policy most certainly will change.

To clarify, when I say electronic money and payments, I am referring to any electronic form of access to a payment instrument or the payment instrument itself, if it exists in electronic form. By this definition, checks written on bank deposits are not electronic money, even though the deposit balances themselves are recorded only in electronic form at the account holder's bank. On the other hand, electronic deposit access devices, such as debit and ATM cards, clearly are electronic money. Another

new form of electronic money is the stored-value card, which is like an electronic traveler's check.

So how does electronic money affect the central bank? We at the Fed have a unique perspective on electronic money because we were there at its creation. Our interbank wire transfer system, Fedwire, was the first nationwide payments network in the United States. From our founding in 1914, payment messages were transmitted between the Fed's far-flung offices by telegraph. By 1918, we were using a leased-wire system that provided added security to our communications. The system was converted to teletype in 1937, becoming fully computerized by 1973.

While the private sector has also made significant progress in converting paper-based payments to electronic forms, it has not yet caught up with us in some respects. In fact, the Federal Reserve is today far and away the largest single provider of electronic payment and securities transfer services on the face of the earth. To give you some perspective as to the extent of our involvement in electronic money and payments and how this involvement compares to private-sector activity, I will distinguish between the *stock* of monetary assets used to make payments and the *flow* of payment services this stock makes possible.

Regarding the stock of monetary assets used for making payments, the Federal Reserve is, for all intents and purposes, our nation's exclusive supplier of the so-called monetary base. We issue two types of liabilities that constitute base money, namely, Federal Reserve notes, or paper currency, and reserve balances held by banks and other depository institutions at Reserve Banks. There are about \$425 billion worth of Federal Reserve notes in circulation today—about two-thirds of which is abroad. And

depository institutions hold about \$20 billion of reserve balances with us, including about \$7 billion of clearing balances. The monetary base constitutes the most fundamental payment medium in the economy since it serves as the legal tender money and, more important, because it is the unit in which all other monetary liabilities are denominated.

Notice that the \$445 billion issued by the Fed is somewhat less than the \$715 billion in transaction deposit accounts held at the thousands of commercial banks and thrifts operating in the United States. If we take out the paper currency, however, the Fed's liabilities—at roughly \$20 billion in reserve balances and falling—don't seem to loom large at all.

But this figure is quite misleading in terms of our role in the world of electronic money and payments. What really makes any kind of money an effective medium of exchange is its ease of use, cost-effectiveness and acceptability as a way to settle a payment obligation. The more evident these factors are, the higher the asset's potential rate of use, or "turnover." This brings me to the concept of the flow of payment and settlement services provided by a given stock of monetary assets.

Reserve balances at the Federal Reserve Banks are used very intensively. In the latest full year for which we have comprehensive data, 1994, deposits held by financial institutions at Reserve Banks turned over about 30 times each business day. This means that Fed deposits, which exist solely as computerized entries in our bookkeeping system, supported total payments over the course of a single year of about \$230 trillion, which is 35 times the level of our annual national output! If you add in the electronic transfers of Treasury securities on our books—actually, in our mainframe's memory—the total electronic value transfer carried out in a typical recent year by the Fed was a staggering

\$375 trillion, or about \$1.4 million for every man, woman and child in the United States. This figure includes not just trading in securities and other financial markets, which accounts for the largest amount of Fedwire activity, but also automated clearing house payments, bank-to-bank wire transfers, and final settlement of interbank check clearing operations.

By way of comparison, the major New York City banks turned over each dollar of their demand deposit accounts about 18 times each business day during this same period, producing total transfers, most of which were electronic, of about \$190 trillion. In other words, the Fed's electronic payments business is still some 20 percent greater than that of all the major New York City banks combined. Thus, the Federal Reserve, which is just a fraction of the size of these major banks in terms of employees or deposit balances, produces a somewhat larger volume of electronic payments services. In terms of the dollar volumes transferred, our market share is about 40 percent of all U.S. interbank funds transfers and about 85 percent of all U.S. securities transfers.

The Federal Reserve performs such an important role in the wholesale funds and securities markets today that it is hard to imagine that the payments system would evolve in a way that leaves no role for us or our deposit liabilities. Simply put, we are the *only* default-risk-free provider of payment and settlement services in the market. Even if new forms of privately issued electronic money come to dominate daily transactions, it is quite likely that the providers of these new payment instruments will depend to some extent on Fed balances to execute daily final settlement of their accounts within the system. In addition, the economy will continue to need a standard monetary unit, which we provide.

Thus, it seems quite certain that there will always be some demand for Federal Reserve payment and settlement services. This is of the utmost importance because our ability to implement monetary policy depends on both private banks' and the public's willingness to hold our liabilities. Therefore, the answer to the first question I posed earlier—"Could new forms of electronic money compromise the Fed's ability to conduct monetary policy and control inflation?"—can be answered with a resounding "No." Admittedly, the Fed must adapt to shifts in the demand for its liabilities resulting from new payments innovations and practices, which has always been the case. But new forms of electronic money and payments do not portend a qualitatively new era for monetary policy.

I have no fixed ideas about how the private sector should use its holdings of base money, and I applaud efficiency-enhancing innovations, even if they reduce the relative importance of the monetary base. Clearly, the stock of reserve balances held by banks at the Fed, as well as currency in circulation, can be used more or less intensively to alter the flow of payment and settlement services produced. But the monetary base does constitute an extremely efficient class of monetary assets, considering it costs us a lot less than a half of a cent to keep a dollar of base money circulating for a year. Accordingly, I am concerned when an external force, such as inflation, drives banks and their customers to economize on their use of the monetary base. It is both ironic and unfortunate when the private sector finds it worthwhile to produce costly substitutes for extremely cost-effective Fed liabilities.

In fact, private-sector use of Fed liabilities is rapidly changing. Overnight holdings of Fed deposits—that is, bank-held reserve balances—have been falling for

several years now. In addition, some private forecasters predict that a similar fate may befall currency in the near future, as new electronic substitutes come to market. I believe that if we had already achieved effective price stability today, neither of these trends would be of much significance. This brings me to my second major point, which is how inflation interferes with the role money plays in the economy, particularly in the context of certain forms of electronic payments.

Sweep Accounts and Stored-Value Cards: Reflections of Inflation?

If you are tuned in to developments in the payments system, you may have already heard about “retail sweep accounts.” Essentially, these are computer programs operated by banks to “sweep” customer deposit balances back and forth between various types of deposit accounts. This procedure minimizes reserve requirements, while maintaining liquidity for the customer. Why do banks pay consultants good money to set up these systems? Because sweep accounts can save banks money by reducing the dollars they hold in demand deposit accounts, against which regulations require them to hold nonearning reserves. The deposit accounts into which those dollars are swept are not subject to reserve requirements, thereby freeing up funds for investment in earning assets—for example, in the money market, where rates of 5 to 6 percent are currently available.

I am not concerned with sweep accounts because they reduce the amount of reserve balances at Federal Reserve Banks, although of course they do that. Rather, I am concerned because these accounts represent a real cost to society with no net gain. The savings reaped by banks, in terms of reduced holdings of nonearning reserve

balances or vault cash, are completely offset from society's point of view by reduced Fed earnings, which ultimately belong to the taxpayer. The real resource costs associated with the accounts, however, are lost. Were it not for sweep accounts, the talented people who design and operate them could be applying their skills to more productive activities.

Reasonable people can disagree over whether the central bank should earn seigniorage—the profits from issuing base money—or whether the central bank's operations should be financed in some other way, such as through general tax revenues. In any event, sweep accounts are not an efficient way to reduce seigniorage. Instead, we could pay interest to banks on their reserves or we could rebate a portion of our earnings to reserve deposit holders. In fact, we do rebate 90 percent or more of our revenues to the Treasury.

Two possible approaches to solving this problem are worth considering. One is that the Fed could, if permitted by law, pay interest on reserve balances, thereby decreasing the incentive for depository institutions to try to reduce these balances. The other solution is to achieve and maintain price stability, which I like even more because it would yield a wide range of other benefits, as well. I believe that sweep accounts and similar methods of economizing on money holdings would fade into insignificance if we moved to an environment of credible long-term price stability.

The ultimate source of inefficiency here is not the inability of the government to design reserve requirements that can't be gamed, nor is it the private sector's insatiable profit motive. In my view, the real villain in this scenario is inflation. Three percent inflation and associated interest rates currently result in a 5 or 6 percentage point nominal interest-rate wedge between money market investments and zero interest reserves. Based

on historical experience, the difference would be 2 percentage points or less under price stability, making the incentive to avoid holding nonearning base money much smaller.

I also want to examine a retail payment instrument known as stored-value cards. As I mentioned, these cards have been likened to electronic traveler's checks because the purchaser must pay out funds before using them in a retail setting. The seller of the card, such as a bank, debits the purchaser's deposit account by some amount, say \$100, and programs the microchip embedded in the card with stored value of \$100. This stored value is then used to make retail purchases or even, in some situations, to transfer monetary value from one person to another. These electronic messages could then be used again for payment or cleared by the recipient back through a funds collection network so that he or she could obtain traditional funds in the form of a credit.

Certainly, there may be convenience value in avoiding cash in some circumstances, but most of us already have debit and/or credit cards that serve this purpose. In addition, as my earlier analogy to traditional traveler's checks points out, payment instruments for use in remote or foreign locations that may not have an online connection to a bank already exist. Furthermore, unlike with debit cards, credit cards or traveler's checks, the holder of a stored-value card is unlikely to receive any protection from theft or loss of the value stored on the card. These factors all raise a basic question: What is the business case for stored-value cards?

It appears to me that the economics of stored-value cards depend heavily on collecting an interest rate spread that varies directly with the rate of inflation. Let me explain. I doubt whether purchasers of stored-value cards would pay much to use the cards, either up-front when they load the card or at the point of purchase. Issuers of

these cards would probably consider themselves lucky to earn the 1 percent of value that is typical of traditional traveler's checks. In our example, this might be collected as a \$1 surcharge when the \$100 of purchasing power is loaded onto the stored-value card. Nor are merchant fees likely to be a significant source of revenue for issuers, since competition from low-cost, online debit cards and cash would probably impose an upper limit of 1 or 2 percent of the value of each transaction. Thus, issuers might look forward to operating revenues of \$3 or less per \$100 of stored value created and issued.

Now let's speculate about operating expenses. Judging from our best evidence as to the cost of operating debit card networks, which also require standardized merchant facilities and funds collection networks, these expenses might eventually fall to the 25- to 50-cent per transaction range. Assuming 10 transactions per \$100 of stored value, my guess is that these card programs could actually *cost* their issuers between 5 and 10 cents per transaction when we consider only the fees and expenses generated by the cards.

Why, then, are stored-value systems being developed? The ultimate issuer of the stored-value liability, probably a special-purpose bank owned by a consortium of other banks or nonbank firms, will likely invest funds advanced to it in exchange for stored value in a money-market instrument. Given that the stored-value liabilities themselves will probably pay no interest to the cardholders, the possibility for profit arises solely from sufficiently high nominal interest rates. If the \$100 of stored value were spent steadily over a period of three months, the card issuer could earn enough at a 6 percent interest rate for the stored-value system to break even. If the interest rate were lower, issuing cards in this example would not be profitable.

As I stressed in the case of sweep accounts, it is difficult to avoid the conclusion that stored-value cards are being encouraged by short-term nominal interest rates that are higher than they would be under price stability. Again, we can hardly blame commercial banks for exploiting what they see as a profit opportunity in the current environment of 3 percent inflation and relatively high nominal interest rates.

Conclusion

In sum, then, do we conclude that the Fed is opposed to electronic money and payments? Quite the contrary! Rather, we seek to encourage them. Private initiative and innovation, particularly in the electronic arena, can significantly enhance the performance and reliability of the payments system. In addition, the Fed itself is a major player in wholesale electronic payment and settlement. This active involvement reflects a demand for base money that assures our ability to conduct effective monetary policy, even in an electronic money world.

At the same time, we are also keenly aware that private incentives do not automatically conform to the most efficient use of scarce resources from a societal point of view. In particular, inflation often creates opportunities for private gain at the expense of other parties that are unable or unwilling to defend themselves. From this perspective, price stability is not just good monetary policy, it's also good payments system policy. The Fed has done a credible job of containing inflation at about the 3 percent level over the last five or six years, which has been positive for economic growth and stability. But the economy as a whole, and the payments

system in particular, could operate even more efficiently if price stability were achieved and sustained.

Thank you.