

**Future Directions for Real-Time Gross Settlement Systems
The United States Perspective**

Remarks by

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REAL-TIME GROSS SETTLEMENT

To prepare for this program, with its multinational participation, I decided to track down the origins of the term "settle." I found that it evolved from the prehistoric German "setlaz," which was derived from the same base that produced the English word "sit." In Old English times, it was "setl," which meant "seat." This formed the basis of a verb "setlan" which means "put in a position of repose." That strikes me as a good description of the function of settlement -- to place the financial position of the parties to a payment in repose.

I also looked at a legal definition. In the Uniform Commercial Code, "settle" is defined to mean to pay in cash, by clearing house settlement, in a charge or credit or by remittance, or otherwise as instructed. A settlement may be either provisional or final. N.Y.U.C.C. 4-103(1)(l).

The annotations to that section are interesting. "The term 'settle' is used as a convenient term to characterize a broad variety of conditional, provisional, tentative and also final payments of items . . . [Its] use throughout this Article [4] indicates that in that particular context it is unnecessary or unwise to determine whether the debit or credit or payment is tentative or final. However, when qualified by the adjective 'provisional' its tentative nature is intended, and when qualified by the adjective 'final' its permanent nature is intended."

Times have changed since that was written by a law school professor of mine at Cornell. Indeed, the time frame in which we look at settlement has changed since the early 1970s when that was written. Today, when we refer to Real-Time Gross Settlement or Net Settlement, we are characterizing an intraday event and are concerned about the risk associated with an immediate and final settlement or with a delayed settlement. It is necessary and wise to be knowledgeable about the characteristics of a settlement for an item.

REAL-TIME GROSS SETTLEMENT IN THE UNITED STATES

I. What is real-time gross settlement ("RTGS")?

What is "real-time" settlement? As the transaction is processed, it is settled. That settlement can be provisional or final. In the case of a Fedwire transfer of funds, it is final.

What is "gross" settlement? This means that each payments transaction is settled individually. For the sake of completeness, I should note that I decided not to delve into the origins of "gross."

What is key to the concept of RTGS is the nature of the settling bank. The settling bank can be a commercial or a central bank. What the participants in payments transactions will look for is a settling bank where balance-sheet and liquidity solvency is not an issue. Also, market participants do not relish using a competitor as a service provider in a business product line in which they compete. In some situations, a bank will use a commercial bank as a correspondent for handling the payment and settlement. Or, a bank could choose its central bank to handle the payment and settle the transaction. Finally, a bank could choose to use its central bank merely to settle the transaction.

Today, banks seem to prefer to use their central bank as settling bank. While a central bank could theoretically be balance-sheet insolvent, there typically is no question of liquidity insolvency in its own currency. In addition, central bank money, at least in the United States, can be invested on a same-day basis. The implications of net-settlement arrangements settled on the central bank's books is a matter in need of much more exploration. This is one topic that the Federal Reserve Banks' Wholesale Payments Product Office for which I am the Product Director and Dara Hunt, who is here today and who is the Product Manager, will be focusing on over the next year, along with our colleagues at the Board of Governors.

II. RTGS in the United States.

A. Fedwire.

When thinking about RTGS in the United States, one generally focuses on Fedwire. Fedwire has existed from the earliest days of the Federal Reserve System. In 1918, that early wire transfer of funds system used the state-of-the-art Morse code telegraphic system. What I will do, in keeping with the title of this session, is to comment on its future direction as I go along. I will also focus on wire transfer of funds and not transfers of book-entry securities against payment over Fedwire, which also are settled on a RTGS basis. I would like to do that using a truncated risk-management analysis of the Fedwire transfer of funds operation and look at changes made to reduce or better manage risk over that system.

1. Credit Risk.

Credit risk is the risk resulting from the financial failure of another person. There is virtually no credit risk borne by a Fedwire participant. Most banks, it not all, are comfortable having a balance in their account on the books of a Reserve Bank.

Because Fedwire payments are virtually finally settled as the payments message passes through the Reserve Bank, the Reserve Bank bears the risk that the originating bank will be unable to provide value for the payment made on its behalf. The payment is final; the settlement is final, but the Reserve Bank's customer might have a daylight overdraft in its account.

To monitor this risk, the Reserve Banks have implemented a form of real-time accounting. Debits and credits for various transactions are posted to banks' accounts in accordance with rules established for that purpose. Each Reserve Bank monitors the position in this account in order to be able to ascertain whether a depository institution has incurred a daylight overdraft. As I recall, before the implementation of our high-speed computers, Fedwire payments were dribble posted to a member bank's account during the day. Overdrafts were not permitted, to the

extent they were being calculated. With the introduction of new high-speed systems, that credit discipline disappeared. This disappearance was not a conscious one. As I am sure most of you have heard before, this resulted from the fact that the system was designed by computer experts, not bankers. That situation has been remedied through policy and an account balance monitoring system.

The daylight overdrafts in Fedwire are not regarded as loans but are recognized as extensions of credit incidental to a high-speed, high-volume, large-value wire transfer of funds operation.

The Board of Governors, in exercising its supervision over Reserve Banks, has implemented a risk-reduction policy. Under that policy, and speaking very generally, each depository institution participating in Fedwire establishes, through a self-evaluation scheme, a net-debit limit for itself for Fedwire transfers. The depository institution is expected to remain within that limit. As it approaches the limit, it starts throttling its payments until sufficient funds have been credited to its account.

However, during the 1980s, those limits were still quite sizable and of concern. The Federal Reserve did not want to eliminate daylight overdrafts. Instead, the Federal Reserve wanted to create an incentive for banks to take actions to control and reduce daylight overdrafts. This was done through pricing. A fee is imposed on daylight overdrafts over a stated amount.

The Reserve Banks actively manage this credit risk. Each Fedwire's participants' balance, as I mentioned earlier, is calculated in real-time. We refer to this as ABMS, the account-balance monitoring system. At the extreme, the monitor can be set at zero, in which case any payment message which would give rise to an overdraft would be rejected.

In some cases, the Reserve Bank could determine that it would only allow a daylight overdraft against collateral. In that case, the Reserve Bank would determine the amount of credit that would be permitted, supported by that collateral. The ABMS would be set allowing a daylight overdraft in that amount.

Collateral is a topic that warrants a separate discussion. In general, credit risk can be lessened or eliminated through the use of collateral. I have observed, over the past few years, that collateral is more and more being viewed as a cure-all for credit risk and other risks, as well. It is a useful tool but not without costs.

This raises several issues that need to be considered. First, collateral requirements can have competitive implications. If a depository institution participating in a payment, clearing, or settlement system could pledge only United States Government securities, I would guess that domestic banks would have a competitive advantage over foreign banks. Second, think of the nature of a commercial bank -- a commercial bank is a firm that is a supervised and regulated, unsecured debtor with respect to its creditors/depositors. The bank's assets are to be applied to satisfy its creditors/depositors. If a material amount of assets are pledged to secure a particular type of non-depositor creditor, such as a clearing, payment, or settlement system, this could have an effect on the creditworthiness of the institution. The credit evaluation of a bank by analysts might lead some to conclude that the bank with a substantial amount of pledged assets has a greater risk profile and should have a lower credit rating. That is, how well the depositors and other general creditors of the bank will fare if the bank fails could depend in significant measure on whether the bank fails during the operating day where it has pledged a significant or material amount of assets to participate in a clearing, payment, or settlement system or whether it fails later in the day after the system has settled. A multinational bank probably is participating in some clearing, payment, or settlement system somewhere in the world from 8:00 am Sydney time on Monday to 6:30 pm New York time on Friday.

If I can return to my role as Product Director of the Wholesale Payments Product Office, I would like to set out some credit-risk issues which I think should be addressed over the near term. First, in the provision of these payments services, the Federal Reserve constantly must balance risk management and provision of payment services. Initially, maintaining this balance is the responsibility of the Product Office in the development and implementation of its main products -- Fedwire transfer of funds, Fedwire transfer of book-entry securities against payment, and net settlement. In the Fed, we have had a tendency to look at these roles as being on opposite ends of a spectrum. I hope to achieve this balance in the Product Office, while recognizing that risk management must be done in context of our role as central bank.

Second, we are seeing what our colleagues in London, Australia, and elsewhere are planning to do to ensure the operation of RTGS systems without daylight overdrafts. We need to see how what they have learned can be applied to our RTGS system.

Third, as you may know, in 1997, Fedwire is scheduled to expand its operating hours. This 12:30 am opening does give rise to credit-risk issues that need to be explored. The Product Office will begin a project to explore these risk issues along with operational ones associated with expanded hours later this month. Related to this are the G-10 central banks and the Group of 20 efforts to eliminate foreign-exchange settlement risk.

2. Market Risk.

This is the risk associated, for these purposes, with interest-rate and foreign-exchange rate fluctuations. That is not an issue with respect to Fedwire transfers of funds. I will not get into the issue here except to note that interest-rate risk is associated with the transfer of book-entry securities against payment over Fedwire, where the market value of those securities is a relevant consideration. It is also a consideration with respect to collateral posted to cover daylight overdrafts.

3. Operations Risk.

One could devote an entire program on the management of operations risk on Fedwire. Operations risk is the risk of failure of the system resulting from operations considerations.

Two concepts are key to reducing operations risk -- contingency planning and redundancy. We believe that Fedwire should be up and running on all scheduled business days. Moreover, it should be up and running at all times during the business day. When the Northeast was hit hard by snow recently, all affected Reserve Banks -- Boston, New York, Philadelphia, and Richmond -- were open, on time, for the full business day for both wire transfers of funds and securities. That is as it should be. That is a responsibility that we at the Federal Reserve and you who regard yourselves as major players in the financial markets have to the financial markets.

Fedwire is designed with more than three levels of physical redundancy of hardware, telecommunications facilities, utility electricity, and self-generated electricity. We are aware that, while our software and data bases are redundant, this redundancy does not fully protect us from errors and corruption of the software and data. For example, notwithstanding redundancy, there will be only one software program. That, to me, is an area that needs more thinking.

4. Legal Risk.

I am not referring to the high cost of lawyers. Legal risk, for our purposes, can be defined as the risk that the payments made or settled over a payments system will not be valid and binding. Legal risk has been relatively low in Fedwire for some time. Since the 1970s, the Board of Governors Regulation J governed wire transfers of funds through the Reserve Banks, the first regulation of its type in the world. It served as the model for the new Article 4A of the Uniform Commercial Code, which governs non-consumer wire transfers of funds. The Board of Governors has incorporated Article 4A into its Regulation J. It has provided commercial certainty with respect to wire transfers of funds over Fedwire.

5. Design Risk.

This is the risk that the system designed will not be responsive to user needs or flexible enough to respond to changing user needs. I mentioned earlier how an earlier version of Fedwire was designed without due regard to the banking nature of payment systems. Fedwire is a mature payments system. Nonetheless, major improvements are underway. We are now testing and later this year will implement a new expanded format for funds transfers, making Fedwire more compatible with other payments and communications systems. This year we will also implement new software for the book-entry system. This software will provide us with more flexibility and will allow us to operate that system with the same types of controls found in other delivery-against-payment systems in the United States.

Over the coming year, we will introduce a better strategic planning process for the Fedwire transfers of funds and securities businesses. In doing that, we will be conscious of our role as central bank and on the need to be creative in the direction these systems should be headed. Another issue to be considered is, if legislation prepared by House Banking Committee Chairman Leach is enacted eliminating the Glass-Steagall Act, that that legislation provides for wholesale financial institutions -- State-chartered, non-insured member banks with access to Reserve Bank services and the discount window. These WOFIs would be affiliated with investment banks and foreign banks. Also, as you know, in 1997, we will be faced with interstate banking in the United States and will need to shape our payment services to serve interstate banking organizations efficiently and effectively. In sum, our plate should be full for some time.

6. Settlement Risk.

It may come of some surprise to you but, as matter of theory, a Reserve Bank has settlement risk in respect of its interdistrict wire transfers of funds. This says something about net settlement. Transfers of funds that pass between the twelve Reserve Banks are settled on a net basis. That net is determined first thing the following day and reflected in "due to" and "due from" accounts. These "due to" and "due from" amounts are settled once a year among the Reserve Banks by a transfer of assets. Considering the liquidity and balance-sheet positions of the Reserve Banks, that risk should be about zero.

Some of my colleagues think that I am stretching the analogy here, and perhaps I am guilty of that. My point in raising this is to suggest to you that the debate as to whether a country should have an RTGS system or a net-settlement system is not the real debate. The debate is whether a net-settlement system which settles on the books of the central bank is sufficiently safe and sound.

If you will allow me to walk further out toward the edge of the cliff, a payments system such as CHIPS could be a purely private-sector RTGS system, if all CHIPS payments were posted to the books of a private commercial bank that was regarded broadly balance-sheet and liquidity solvent.

In the United States, the focus of the RTGS/net-settlement debate has been on CHIPS. Over the years, with the encouragement of the central bank, the risks associated with CHIPS are now managed on a basis that is satisfactory. I do believe that there is room and a place for both types of systems in a country. In fact, considering the large number of United States dollar payments made, I am not sure those payments could be made over Fedwire within existing constraints. In addition, having a private-sector alternative also serves to inspire those responsible for Fedwire to keep that system under continuous improvement and to keep costs as low as possible.

At times, I have a concern whether that competition is fair. One source of my concern is that net settlements are made over Fedwire. While participants do post collateral to back their additional settlement obligations and that collateral has a cost, an argument can be made that settlement over Fedwire is subsidized. This is an issue that has not been explored, and I am far from sure whether it would bear either sweet or bitter fruit.

III Conclusion.

The past six months have been interesting ones for me. Part of the fun in working at a central bank is the opportunity to combine public policy considerations and business considerations. These considerations do come together in our two RTGS systems. The challenge is to keep those systems vital, safe, and prudent. In the words of the organizer of this symposium, they are the plumbing of our financial system. They are the base on which our financial markets rest. I cannot end without noting Jerry Corrigan's contributions in informing and educating financial market participants that this is not just "back office" stuff. It is the stuff of which banking is made.
