

**The Controversy Continues:
Gross vs. Net Settlement
Remarks by**

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Making Electronic Payments A Global Reality

It is my pleasure to be here with you today to speak about gross and net settlement. I would like to start my presentation with a brief discussion of why payments issues of this sort, which were once within the bailiwick of certain technicians, are issues which appear with some frequency in the financial press and in discussions at the highest levels of public policy makers. Then I will define real-time gross settlement and net settlement. After that I will consider some of the costs and benefits of these two system types and their respective roles in the payments system.

The fact is now broadly accepted that payment systems are the plumbing and foundation of our financial markets. A market that rests on an unsound foundation will likely incur difficulties that could have systemic implications. As a central banker, I am interested in stability, particularly the stability of prices and financial markets. Part of this is ensuring as best we can that systemic risk is minimized. That needs to be done in a context where, to the extent reasonably possible, market forces are used as a disciplining factor.

I would first like to describe what is referred to as RTGS -- Real-Time Gross Settlement in the context of a payments transaction. I will do this by dissecting the phrase.

Starting with the last first, the first term to be defined is "settlement". "Settle" is defined in payments law to mean to pay in cash, by clearing house settlement, in a charge or by remittance, or otherwise as instructed. Some transaction has given rise to a debtor/creditor obligation that will be settled in money, broadly defined. I should note that settlement can be provisional or final. A provisional settlement can be reversed, charged back, or otherwise undone by a contingent event, the action of a settlement agent or a participant in the settlement process. A final settlement is, as the phrase suggests, final.

Having defined "settle", I will move on to "gross". In the context of payments, it means that each payment instruction or item will be settled individually and separately from all other items. For me, this is easily understood in the context of Fedwire. Bank A issued a payment instruction, a wire transfer of funds, to the Federal Reserve Bank of New York to pay \$1 million to Bank B. If the FRBNY is willing to act on the instruction, the FRBNY will become a creditor of Bank A and a debtor of Bank B. The FRBNY will settle those obligations by debiting Bank A's account and crediting Bank B's account on the ledger of the FRBNY. That payment instruction will be individually settled in that manner.

What does the phrase "real-time" add to this. Theoretically, the FRBNY could defer the posting of those settlement debit and credit entries to its books to later in the day or another day. The Reserve Banks have always considered the underlying payment instructions to be final at the same time they are processed. That is, the settlement is regarded as posted to the creditor bank's account at the time the payment instruction is acted upon and advice is sent to the receiver, Bank B.

This leads us to the ethereal question of what is an account. An account reflects the debits/credits relationship between the bank and customers. Typically, the physical act of posting -- in and of itself, the dipping the quill into the inkwell and then making marks on a piece of paper does not have legal significance. The entries to the books reflect, in some manner, a debtor/creditor relationship.

I have been long fascinated by the concept of what is the balance of an account during the business day. In theory, that balance is the sum of various transactions being carried out by various areas of the bank. I guess the question is: Is there a balance if it cannot be ascertained until a later time? This question might well be answered in the context of a bankruptcy if a court rules that no entries can be made as a result of instructions received after the bankruptcy of the customer. What do you do with a credit received after declaration of bankruptcy? Is the bank authorized to post the credit? Can provisional credits to the account be reached? Can other claims be set off against the account? These are matters governed by national bankruptcy laws.

The Reserve Banks have established a system that comes as close to real-time accounting as is reasonably possible. What I mean by that is that debits and credits are regarded as being posted to accounts at the time the debtor or creditor relationships arises. Therefore, a Fedwire transfer of funds is carried out over a real-time, gross final settlement payments system.

Having just described RTGS, what is meant by net settlement? Net settlement is the settlement of a number of obligations or transfers between or among counterparties on a net basis. The concept of netting is rather simple. I owe you \$5; you owe me \$3. We agree to net our claims; I owe you a net of \$2. While netting is pretty simple in this example, when applied to clearing and settlement systems, it can become quite complex. The first type of net-settlement system I would like to discuss is the check clearing house. Checks, as you know, are exchanged at a central location -- the clearing house. The clearing house calculates the amount that each bank has presented to each other. The total amount that each bank owes and is owed is netted. Each bank either owes an amount, is owed an amount, or has a zero obligation. Settlement sheets are then sent over to the Reserve Bank where the net debits and credits are posted to the banks accounts. The benefits are clear; checks are exchanged at a single spot, and all participants pay or receive a single amount.

But what happens if one participant fails before the checks are finally paid? The failed bank's receiver theoretically has an obligation to return the checks that have not been settled. Does the receiver have an obligation to return checks that have not been finally paid? This would be done to receive a refund for the settlement of those checks and to capture additional assets for the estate of the failed bank. A receiver has a fiduciary obligation to the creditors of the estate -- a fair **pro rata** distribution. The receiver has no obligation to the payments system, except in the case of systemic risk. Probably, having experienced such actions by receivers in the past, the check clearing rules of the New York Clearing House provide that, if a bank closes and is unable to settle its net-debit position, all checks presented to and presented by that bank in the clearing that were not settled will be returned to the presenting banks. That is a partial unwind of the settlement, bringing the failed bank's position in the clearings to zero.

Why do I raise this antiquated rule? Because it could occur today. I assume that banks are not terribly concerned with the systemic risk presented by check clearings. One reason for this is that the FDIC and the Federal Reserve have worked with failing banks to try to ameliorate the impact of a failing bank on the payments system. That becomes more difficult each year as the FDIC becomes more concerned about the costs of bank insolvencies. In addition, in most bank insolvencies in the past, the insolvent bank's estate did not contain sufficient assets to

make it worth the while for uninsured, unsecured creditors, including uninsured depositors, to pursue their claims. I cannot recall a case of a bank creditors' committee or uninsured depositors committee. This could change as a result of the progressive discipline in bank supervision which should result in banks closing with positive capital. In such cases, it might become worthwhile for these creditors to actively pursue their claims. The FDIC as receiver will have to be responsive to the concerns of these beneficiaries of its fiduciary obligations. This could mean reversing payments that gave rise to debits at the failed bank's correspondents in order to build the assets of the bank's estate and to increase the number of creditors, thereby ensuring a fair **pro rata** allocation of assets to creditors.

Netting for small payments, such as the majority of those made by check and ACH, is widely accepted as being a cost effective method for settlement. However, based on my illustration a minute ago, there are a number of risks in these systems that need to be at the forefront of peoples minds. These risks take on special importance when small-value systems are used to make large-value payments. We are aware of specific instances where large-value payments have been sent through the ACH.

The wisdom in some circles has been that RTGS can do much to reduce risk, and this is true to a significant extent. However, there are costs and benefits to RTGS and net-settlement systems that I will discuss.

Real-time gross settlement offers a number of benefits. For one, RTGS systems may provide intraday finality. (I noted earlier that RTGS systems may have either final or provisional settlement.) With intraday finality, banks are assured that payments received during the day are irrevocable and unconditional. RTGS may also promote delivery versus payment, or DVP, for securities settlement and payment versus payment, or PVP, for foreign exchange settlement. I will discuss each of these benefits in greater detail.

Intraday finality, by removing the possibility of an unwind, may help to reduce systemic risk. That is, the failure of one participant in a RTGS system to meet its obligation should not cause other participants to be unable to meet their obligations. Such a situation could potentially arise in a settlement system that employs an unwind procedure. After an unwind, surviving participants could find themselves with dramatically different settlement obligations. Some might have unanticipated large net debits at a time when money markets are less liquid and funds more difficult to obtain.

RTGS systems may also be used to provide DVP for securities settlement systems. DVP ensures that delivery of securities occurs if and only if payment occurs. With an RTGS system, a delivery of securities may be linked with a final transfer of funds. Fedwire, for instance, provides this feature in the Securities Transfer Service.

RTGS systems, furthermore, may help reduce foreign exchange settlement risk through PVP. PVP involves the simultaneous delivery of funds in the two currencies. By making both payments over RTGS systems with finality, there is no possibility of having one leg of the transaction revoked. However, PVP presupposes overlapping operating hours of the relevant RTGS systems. To address this very issue, the Federal Reserve is extending the opening time of Fedwire to 12:30 a.m. Eastern time in 1997. But even if operating hours do overlap, liquidity might not be readily available at one of the systems at the time of settlement.

The appeal of RTGS is reflected by the international trend toward establishing RTGS systems. For example, as I am sure Wolfgang Michalik can elaborate on in great detail, the European Union countries have made the development of RTGS systems a high priority. Under the Minimum Common Features for Domestic Payment Systems each country should have as soon as feasible a RTGS system into which as many large-value payments as possible should be channeled. The EU countries, furthermore, intend to link their RTGS systems into the Trans-European Automated Real-Time Gross Settlement Express System, or TARGET, to support monetary union. But the fascination with RTGS systems has not been limited to the EU. The Czech Republic, South Korea, and Thailand have already implemented RTGS systems and Australia, China, Hong Kong, New Zealand, and Saudi Arabia have plans to do so in the near future.

The benefits of RTGS, however, may have substantial costs. In order to avoid gridlock, payment system participants will need liquidity. This can impose costs on the participants. For example, large clearing balances at the central bank or correspondent banks or collateral to secure intraday credit may be needed.

Gridlock, in the case of a funds transfer system, occurs when the failure of some transfer instructions to be executed prevents a substantial number of other instructions from other participants from being executed. In other words, everyone is waiting for everyone else to make payments. This can occur for a variety of reasons. Concern over the condition of a participant is one potential cause and suboptimal queuing and prefunding requirements are others. Gridlock can potentially result in significant delays in processing payments and, at worst, result in payments never being processed on the intended day.

One way a bank can assure its payments will be processed is to maintain clearing balances at the central bank. Tying up funds for clearing purposes, however, can be costly and may result in competitive disadvantages for non-local banks which do not normally maintain large reserves at the central bank.

Another way for a bank to gain liquidity is through intraday credit from the operator of the RTGS system, typically the central bank. Most central banks, however, are unwilling to extend uncollateralized intraday credit. I should note that the Federal Reserve is the only operator of a major RTGS system that extends uncollateralized intraday credit and even that credit is bound by limits and charged for. Therefore, both domestic and foreign banks that rely on intraday credit to process their payments will need in most cases to maintain collateral with the central bank. A non-trivial concern of some countries developing RTGS systems is the possibility of insufficient amounts of government securities to serve as collateral. This has not been a problem in the United States.

Despite the costs of RTGS systems, they offer undeniable strengths and recent efforts by central banks throughout the world to develop these systems will have clear benefits. Nevertheless, we should remain conscious of the cost of this type of system and open to alternative approaches for net settlement which may adequately control risk in a cost effective manner. That is, RTGS is merely one solution to payments system risk, and it must not be raised to the level of a theology. This is especially true in the United States where we do not have the same need for a common standard as in the EU.

Central banks may opt to develop RTGS systems for themselves, but it may be inappropriate to require RTGS of private payment mechanisms. This, of course, is the model currently in practice in the United States, with the Federal Reserve operating an RTGS system and CHIPS settling on a net basis. While the netting systems of the past had clear weaknesses, and we do not want to return to those types of arrangements, we need to recognize that great improvements have been made in netting arrangements and strive for continued innovation and improvement in this area. The New York Clearing House Association, for example, recently changed the rules governing CHIPS to improve settlement finality. This was just the latest in a series of improvements to the risk controls in that system which have included net-debit caps and settlement liquidity arrangements backed by collateral. Taken together, these controls are designed to assure that CHIPS can settle, even if the largest bank on the system cannot settle and even in numerous multiple failure scenarios.

One of the clearest benefits of net settlement is its potential efficiency from an economic point of view. That is, it can be cheaper to settle payments on a net versus a gross basis because, for example, fewer actual transfers need to be processed and large clearing balances may not be necessary.

I should point out that some in the industry believe that through the use of new technology and advanced queuing methods RTGS can be more efficient than net settlement. If this is the case, I certainly want to encourage the development and use of such systems. Nevertheless, I believe net-settlement systems should not be dismissed. Instead, they should be given the opportunity to compete with RTGS systems both in terms of

efficiency and safety.

Given the potential efficiency of net-settlement systems, the key issue is how the risks in these systems are controlled. Such controls are especially important because net-settlement done poorly can obscure risks and cause systemic problems if there is a market disruption. In fact, a net settlement system may rely on its right to unwind transactions as its overriding method for addressing a default but lack a safe and realistic method for unwinding transactions if the need occurs. The systemic risk of this situation in a system processing large-value transfers is unacceptable from a central banker's point of view.

Although the specific controls that are needed in a large-value system such as CHIPS are different from those needed in an ACH, the issues are the same: how are risks identified, what incentives are created for controlling those risks, and what means are provided for managing them. While satisfactorily addressing these issues is not a simple task, I believe that with proper diligence net settlement systems can do so. This can be achieved through the use of a variety of safety controls -- such as membership standards, monitoring of participants financial condition, size limits, net-debit caps, position limits, collateral requirements, credit lines, and loss sharing arrangement--that must be appropriate for the specific level and type of activity in the net-settlement system.

In the end, systems around the world may continue to move to RTGS. But this move should be based on an informed consideration of alternatives such as net settlement, a willingness to consider innovations as they develop and a recognition of the need for the payments system to remain economically viable. The debate, as I see it, is not one where a single type of system emerges as the winner but rather one in which decision makers in the public and private sector make choices with a clear understanding of the risks and the means to manage and control these risks.
