Risk reduction in payment and settlement systems

*The **Governor** reviews[1] the steps that have been taken to reduce the risks in the UK payments system, and in securities and foreign exchange settlement arrangements, and what more needs to be done. The introduction of real time gross settlement (RTGS) represents a fundamental improvement to the security of the payments system in this country. Likewise, the proposed RTGS system for payments throughout the European Union (TARGET) will reduce the risks in pan-European payments and support closer European economic and financial integration. Also, RTGS opens up the way to real-time final exchange of value (delivery versus payment—DVP) in relation to securities and foreign exchange settlements. The **Governor** notes that for DVP in securities, we now have most of the individual bricks but have yet to build the wall. On foreign exchange risk, the **Governor** commends the recent G10 report, and notes that it proposes a three-point strategy to address foreign exchange settlement risk encompassing action by individual banks, by industry groups and by central banks.*

I am delighted to have been invited—by the Chartered Institute of Bankers and by King's College—to deliver this year's Gilbart Lecture. I am delighted not least because it gives me the opportunity to bury the hatchet that came between James William Gilbart and the Bank of England over 160 years ago!

It has to be said that not much love was lost between Gilbart and my predecessors at that time. This was not entirely Gilbart's fault. His crime was to become the first general manager of the London and Westminster Bank. Now I should like to reassure Mr Derek Wanless—who delivered last year's lecture—that we no longer regard becoming general manager of NatWest as a crime—at least not in and of itself! The problem in Gilbart's case was that the London and Westminster Bank was the first joint-stock bank to breach the Bank of England's monopoly of joint-stock banking in London as a result of a scandalous loophole in the 1833 Act of Parliament renewing the Bank of England's Charter—and, as its General Manager, Gilbart represented commercial competition.

Somewhat ungraciously the Bank of England initially denied Gilbart a drawing account and declined to discount his bills—and he was refused access to the clearing house. And we were less helpful than we might have been some years later when one of his correspondent banks ran into financial difficulty.

But we take a more benign attitude to commercial banking competition these days. So I am happy to set the record straight by acknowledging the very important contribution that Gilbart made in the 19th century, both in his practice and in his extensive writings, to the development of the principles of banking.

I acknowledge in particular this evening Gilbart's interest in payments and settlements, which I have taken as the subject of my lecture.

You do not need to look back to the 19th century to be conscious of the awesome process of change that has affected banking and other financial services activity, both in this country and internationally. In the past 10–20 years alone the pace of change has been explosive. Everyone here will be familiar with the dynamic, inter active, pressures of advancing information technology, financial innovation, deregulation, and intensifying competition—all on a global scale.

One—of the very many—consequences of this process has been the exponential growth in the volume and value of financial transactions and the corresponding growth in the volumes and values passing through the world's payments and settlements systems.

In this country alone the average *daily* throughput of our large value sterling payments system is currently running at almost £120 billion, which compares with some £40 billion only a decade ago. Of that £120 billion, about half represents the sterling side of foreign exchange settlements. In addition, there is another roughly £120 billion of sterling money-market, gilt-edged and equity market transactions settled net daily through securities settlements systems, and that too is a huge increase compared to ten years ago.

As these numbers have increased, so too have the related payments and settlements risks—the risks that the funds, or the other financial assets, which you had been expecting to receive, and on which you may have been relying to honour your commitment to make payments, or transfer assets, elsewhere, do not in fact arrive.

(1) In the Gilbart Lecture organised by the Chartered Institute of Bankers, Tuesday 22 October 1996.

Such a payments or settlements failure could have serious repercussions for an individual or for a non-financial business. For banks and other financial intermediaries they could be catastrophic. A large part of the daily values passing through payments and settlements systems is in fact a result of transactions undertaken by banks and other financial intermediaries directly with each other, whether simply on their own account or to cover transactions undertaken with their customers; and these direct transactions in themselves produce huge payments and settlements exposures within the financial system. But further interbank exposures can arise as a result of transactions directly between their customers, and which the banks may not even know about until they are called upon to settle them.

As the size of these exposures within the financial system, and the interdependence of financial intermediaries, have increased, so too has the risk that a payments or settlements failure by one institution could bring down others, and ultimately disrupt the financial system as a whole.

For many years payments and settlements risk was largely disregarded as an administrative matter for the 'back office'. Perhaps not surprisingly as the numbers have grown, there has, over the past ten years or so, been a growing awareness—among both commercial and central bankers—of its crucial importance, so that it has moved up the agenda, from the back office to the board room. In the rest of my lecture I should like to describe to you the steps that have already been taken to reduce the risks in the payments system, and in securities and foreign exchange settlement arrangements, and what more needs to be done.

The payments system

Let me begin then with the cash payments system—and I will concern myself with large-value payments because that is where the risks in the payments system are largely concentrated.

In his book 'The History, Principles and Practice of Banking' Gilbart describes the origin of the London Bankers' Clearing House which was set up in about 1775 to enable the member banks 'to exchange bills and cheques against bills and cheques, and thus to be able to carry on their business with a less amount of capital'. He describes, in other words, a clearing arrangement in which the banks' mutual obligations were netted off against each other before settlement in currency rather than each obligation being settled individually, gross. Gilbart goes on to describe the great advance made in 1854 when the net settlement in cash was 'superseded by transfer to and from accounts which each member of the Clearing House was obliged to keep at the Bank of England'. In essence, these payments arrangements, involving end-of-day net settlement of clearing balances across accounts at the Bank of England remained unchanged until earlier this year.

There have—it is true—been changes affecting the *form* in which large-value sterling payments were made. In particular there was the introduction of an electronic, same day, credit transfer system (CHAPS) in 1984, to run alongside the existing same-day, large-value debit clearing system for cheques drawn in the City of London (the Town Clearing). But in either case, while the receiving or collecting banker would typically make the relevant funds available to his customer when the CHAPS instruction was received or the Town cheque paid in, he did not receive value from the paying banker until the relevant net settlement was completed at the end of the day.

It would, in principle have been possible for a clearing bank to monitor CHAPS receipts and payments due from or to other clearing banks—during the course of the day, although it is not clear how far this was in fact undertaken in practice. But in the case of Town Clearing cheques the collecting banker would not know the amounts due to him from other banks until he aggregated the cheques for presentation in the clearing; and the paying banker—unless he had made special arrangements for his larger customers to notify him in advance—knew how much he owed only when the cheques were presented in the clearing.

These arrangements were clearly unsatisfactory from many points of view. Apart from the complications they involved for the major banks' treasurers in managing liquidity efficiently, they exposed the banks to unquantified risks *vis à vis* each other. In practice, if a bank found itself unexpectedly short of immediate liquidity at the end of the day it was able to borrow from the other clearing banks or, normally, at a penalty, from ourselves. But if—which God forbid—it had found it impossible to borrow for some reason the chaos that could have been involved in unwinding the clearing is unimaginable.

The Bank began to explore these issues with the other CHAPS member banks some six years ago. We sought first to measure and monitor the extent of the intra-day risks that the banks were incurring *vis à vis* each other through CHAPS; and the result of that exercise—which I have often called the first stage of enlightenment—quickly led, as an interim step, to the imposition of limits on the extent to which a CHAPS bank could build up a net sender position *vis à vis* another CHAPS bank during the course of the business day. Taken together with the termination of the Town Clearing, this meant that the banks not only knew of the extent of their exposures within the system but could impose limits on them—a state that I have described as the second stage of enlightenment. It was a very considerable step forward in ensuring that banks not only monitored their developing positions but had a clear incentive to manage those positions more actively in order to avoid a situation in which their payments instructions, and those of their customers, were delayed as the limit became effective.

But although the introduction of intra-day limits on CHAPS net sender positions was a big step forward, it was always seen as only an interim step on the way to Nirvana in the payments system—the end objective being to move to individual large-value sterling payments paid gross across accounts at the Bank of England to ensure finality, continuously in real time during the course of the business day. And the movement of CHAPS onto this real time gross payments systems (RTGS) was completed in April this year. It means that you can now ask your bank to debit your account, debit its own account with the Bank of England and credit the corresponding account of the receiving bank, which can then in turn confidently credit the payee's accounts in its books with instantly available funds, all in real time, *eliminating* payments risk all the way along the line—between you and your bank, between the two banks concerned, and between the receiving bank and its customer. It is a gigantic advance—certainly as significant as the last major advance in payments arrangements recorded by Gilbart in 1854. And the fact that it has been accomplished with so little fuss—indeed I suspect that very few people in this country have the slightest idea that it has occurred—is a great tribute to all those at the Bank of England and in the APACS banks who have brought it about. I take my hat off to them.

It does not, of course, mean that banks no longer have exposures to each other—they still trade in each other's paper and borrow from and lend to each other through the interbank market and so on within whatever limits they choose to apply. But they are no longer subject to unintended intra-day exposures to each other arising, outside their control, simply as a function of the operation of the payments system. There is no longer a clearing of large value interbank payments to be unwound in the event of the failure of one of the settlement banks, and the systemic risk of contagion from an initial bank failure *through the payments mechanism* has been removed.

RTGS is in effect equivalent to the earlier CHAPS arrangement but with the limits on net sender (and receiver) positions set at zero; a bank must in other words have cash in its account with the Bank of England before it can make a payment to another bank. This means that unless there is adequate liquidity somewhere, the whole payments system could become frozen as banks wanting to make payments waited in vain for expected receipts from other banks. That is not actually our intention! The necessary liquidity to protect the system against gridlock comes partly from cash balances held with the Bank of England by the banks themselves. But if it were wholly dependent on owned liquidity the system would be likely to be very expensive—for both banks and their customers—compared with alternative possible but less secure payments mechanisms. So the Bank of England itself stands ready to provide the settlement banks with intra-day cash advances, without limit and without charge, but always against first-class security. Such advances (intra-day credit) are repayable before the end of the business day. In effect, they make explicit the intra-day credit extended implicitly during the course of the day under the earlier end-of-day net settlement arrangements but which was not, as I say, until recently even measured or monitored. I am certainly not aware that it was regarded as having any significant implications for monetary policy. To discourage any tendency for intra-day credit to spill over into overnight credit, which, if it were persistent or on a substantial scale, *could* in principle have a more significant impact on monetary conditions, we would normally charge penal interest on any such cash advances that were not in fact repaid before the close of business. That is to say we would charge a penalty rate compared with that which currently applied to our normal short-term assistance to the money market and which is the key official interest rate for monetary policy purposes. But we have not in practice had to do this on any scale since RTGS began in April; nor do we expect to have to do so.

RTGS, as I say, represents a fundamental improvement to the security of the payments system in this country. But, more than this, it opens the way to real-time final exchange of value—or delivery versus payment—in relation to securities and foreign exchange settlements. It is something that Gilbart could scarcely have dreamed of because it only became possible through the relatively recent advance of information technology.

TARGET

But, before I move on to settlement systems, let me make just a few remarks about present proposals to introduce RTGS into payments arrangements throughout the European Union through the TARGET project, which has been in the news recently.

The idea behind TARGET is straightforward. It is to link together European national RTGS payments systems, denominated in the single currency—the euro—so that large-value payments can be made or received *throughout the European Union area*, with finality and in real time, in exactly the same way as they can at present within those countries with national RTGS systems denominated in national currencies. One of its purposes, we have always understood, is to reduce the risks in pan-European payments—just as RTGS reduces the risks in national payments systems—in support of closer European economic and financial integration. A particular purpose is the integration of the euro money market to ensure that the same short-term euro interest rate—determined by the single monetary policy of the European Central Bank—prevails throughout the region. It is a project which we strongly support.

It is generally agreed that *all* member countries of the European Union may connect national RTGS systems to TARGET. The issue that has arisen relates to the provision of intra-day euro liquidity within countries that are not, or not yet, members of the euro area itself. Some argue that it would be unique for such liquidity to be available beyond the bounds of a single currency area; and that intra-day liquidity should be denied to, or at least restricted in, the non euro member countries, apparently on the grounds that it could otherwise complicate the implementation of the single monetary policy. Others, including ourselves, argue that it is a natural corollary of the extension of an RTGS system across borders, which is itself unique. They go on to argue that complications for monetary policy arise essentially if intra-day credit spills over, substantially or persistently, into overnight credit, and point out that this, as indeed any conceivable effect of intra-day credit, can occur just as readily in euro-member as in non-member countries. They, therefore, see no grounds for any discrimination, and argue that the potential spillover into overnight credit can be deterred quite adequately through penal interest, as it is in our own present RTGS payments system. The only effect of denying or restricting intra-day liquidity in this case would be to increase somewhat the cost of using TARGET, and so to encourage the use of alternative, less secure, payments arrangements, such as correspondent banking arrangements or the private sector euro net settlement system. It is unlikely to deter the international use of the euro significantly—if that were the objective—any more than lack of direct access to national RTGS systems deters the international use of the dollar or yen or Deutsche Mark now.

A good deal has been made of this issue in the media—perhaps more than is warranted. I would hope that we will be able to resolve the issue through the ongoing technical dialogue in the EMI as we have resolved other issues in the past. We all have a common interest in eliminating payments risk—nationally, regionally and indeed internationally—because the systemic risks of contagion through the payments mechanism are not constrained within national boundaries.

Securities settlement

Let me return now to my main theme and move on to the progress we have made on reducing the risks in securities settlement systems.

My own introduction to the fragilities of securities settlement in this country began in the early 1980s, when I discovered to my horror that huge amounts of gilt-edged stock changed hands in the form of certified and executed transfer forms against Town Clearing cheques that were often out of date and handed over well after the Town Clearing had in fact closed!

Happily the Bank of England and the Stock Exchange were already co-operating to produce more robust settlement arrangements at that time, which resulted, in 1986, in an electronic book-entry transfer system for settling the stock side of gilt-edged transactions called the Central Gilts Office (CGO). The system enabled changes of ownership of stock to be recorded more rapidly and efficiently, and could cope with higher volumes, than the arrangements it replaced; it provided effective certainty of delivery of good title to the securities in the system. At the same time we needed to establish a link between the surrender of title to the stock and the receipt of payment for it. This 'capital risk' threatened to impede the development of the gilt market following 'Big Bang' because it would otherwise, quite understandably, have caused several of the potentially most active new participants in the gilt-edged market to impose narrow limits on their exposures to individual counterparties. The obvious solution—simultaneous delivery versus settlement in any literal sense—was not available to us at the time because the payments leg of the transaction remained stuck in end-of-day net settlement. So we had to resort to a system of 'assured payments' in which banks providing gilt-edged settlement services *guaranteed* payment on behalf of their customer receiving stock in CGO, taking the stock as collateral, although the payment itself was only made in an end-of-day net payments settlement. This effectively removed the settlement risk for the users of the system. But it left the banks with intra-day exposures to each other which were similar to those that they ran on straightforward payments in the net settlement payments system. One of the reason why I have been so enthusiastic about the RTGS payments system is, of course, that it now makes it technically possible to move literally to delivery versus payment on a continuous basis during the business day. We have already started to explore this possibility with the banks and representatives of the securities markets.

In co-operation with the main participants in the sterling money market, and building on an earlier project—Londonclear—the Bank, in 1990, introduced a similar service for transferring the ownership of money-market instruments, such as commercial bills, Treasury bills and certificates of deposit, by electronic means rather than by physical delivery of the bearer instruments themselves. We called this system—imaginatively—CMO (the Central Moneymarkets Office)! A complication in this case is that many of the individual instruments held in the central depository at the Bank are not fungible with each other in the same way as holdings of a particular gilt-edged security; they need to be identified and transferred separately. Moreover, under present legislation they cannot be 'dematerialised' in the same way. Partly for these reasons it was more difficult for the banks to accept assured payments arrangements along the same lines as in CGO. Nevertheless, CMO has greatly improved the efficiency of trading money-market paper, and eliminated the security risk inherent in the physical movement of bearer instruments around the City; and we will be looking at the available means of providing for delivery versus payment at some point in the future.

The main outstanding gap in improving securities settlement arrangements then was in the area of equity settlement, and a big step towards filling this gap was taken with the inauguration of the CREST service for settling equities and corporate bonds in July this year. It extends to those markets the benefits of improved efficiency through book-entry transfer of ownership and automated links with banks and brokers, and, like CGO, it includes an assured payments mechanism, albeit within customer limits, which reduces capital risk in equity settlements.

All of this represents very considerable progress in relation to securities settlement—which is unrecognisable compared with a decade ago. But the work is not complete. While we do now have most of the individual bricks we have yet to construct the wall. This should in due course involve harnessing the RTGS payments arrangements that we now have available together with the new settlements systems to provide for genuine real-time delivery versus payment. But it should desirably also involve bringing the individual systems closer together in due course to improve the efficiency of the whole securities settlements function and reduce transaction costs. All this will undoubtedly take time, and we need to proceed step by step to ensure that the separate systems are not disrupted in the process and to avoid overloading the City's capacity for systems development. But we are already taking advantage of the need to upgrade the CGO service, to accommodate recent and prospective innovations in the gilt-edged market, to align CGO and CREST software with an eye to possible future consolidation of those systems, and we will be looking for similar opportunities in other areas.

I have focused very much on settlement arrangements for cash securities, but let me add a word briefly about another very important area—the settlement of derivative transactions. The volume of trading in derivatives, both on and off exchange, has also increased spectacularly over the last 15 years. Although the figures often overstate the amounts genuinely at risk, robust settlement arrangements for derivatives are now crucial to the overall stability of the financial system. In London, the London Clearing House already provides clearing for all three of the derivatives exchanges; but we are seeing a number of proposals to provide similar clearing arrangements for over-the-counter (OTC) transactions. We have broadly welcomed this development, subject to ensuring that the necessary infrastructure—in terms, for example, of law, regulation and systems—is properly in place. I note, however, that such clearing houses, which typically act as a central counterparty to all the participants in the clearing, involve a considerable concentration of risk and in turn give rise to important questions about the necessary level of financial resources and their internal collateralisation and control arrangements.

So far, cash and derivatives clearing, whether on or off exchange, have tended to be put in separate boxes. I think one could reasonably look forward to the day, even if it remains some way off, when the separation becomes less clear cut. But whether or not that is the case, we do now have the technology we need to move towards closer integration of payment and settlement arrangements generally in this country. It is to me an exciting prospect.

Of course, payments and settlements risk does not stop at national boundaries and we will ultimately need to contemplate greater international integration of secure payments and settlements arrangements not only within Europe but embracing also other major financial markets.

In terms of cross-border securities settlement, we see at present a number of different models. One, which will be very familiar, is represented by Euroclear and Cedel and involves a central system operating in a range of currencies and in securities with different countries of issue, and linked, where necessary, to individual national settlement systems. An alternative to this, but in many ways a variant on the same theme, is the kind of service now provided by major custodian banks who look after, on a kind of one-stop shop basis, the securities handling needs of their customers. Beyond that, there are examples of direct linkages between national securities settlement systems; and also of direct cross-border access by firms in one country to the settlement system in another. All of these are probably, in principle, viable approaches and this is an area of very active competition at present. I do not know what the outcome of the competition will be; but I draw reassurance from the fact that, whatever the particular form, there now seems to be wide recognition that, in a cross-border context too, the objective is to move towards a robust implementation of delivery versus payment.

Foreign exchange settlement

Our more immediate focus, however, has been on the foreign exchange market, and on foreign exchange settlement risk, to which I now finally turn.

The risks involved in foreign exchange settlements were drawn dramatically to the world's attention over 20 years ago with the collapse of Bank Herstatt, which had received value for sales of dollars against European currencies but which failed to make delivery of the dollar counterpart later in the day in New York. Sadly, we have made relatively little progress towards reducing these risks—until quite recently.

The issue was addressed in a report to G10 central bank governors—drawn up by a working party chaired by Mr Bill McDonough, President of the Federal Reserve Bank of New York—and which I commend to you.

It is a disturbing report in that it reveals not only the banks' inability to control and monitor their foreign exchange settlement risks but a limited understanding of the extent to which they were running the risk at all. That situation is worrying in a market where the equivalent of something like $2½ trillion changes hands every working day.

A bank is exposed to the risk that its counterparty may fail from the moment it issues an instruction to pay the sold currency until it receives the bought currency in final funds. And it does not know that its risk is extinguished until it is informed of the receipt. That exposure is for the full principal amount of the deal—it is like an unsecured loan to its counterparty. The G10 report showed that these risks are not run only within the settlement day, they can run for two, three or more days. In some cases examined in the report a bank's foreign exchange settlements exposures to a single counterparty exceeded its capital.

The G10 report, which was endorsed by the central bank Governors, proposed a three-point strategy to address foreign exchange settlement risk encompassing action by individual banks, by industry groups and by central banks.

The most immediate progress can be made by individual banks themselves—through improving their ability to monitor their exposures. The risks can be contained by more careful release of payment instructions, and by demanding better service from correspondents both in turn around time for payments and in monitoring and reporting receipts. The best banks are already responding to the G10's report and some have shown that it is possible to achieve very large reductions in the size and duration of exposures in this way. Banking supervisors, including certainly those in the United Kingdom, will be taking an active interest in the progress made by individual banks.

Industry groups too can, and are, taking steps to reduce exposures collectively. Well-founded netting arrangements can help—though it is crucially important that they should be legally secure. For a number of years there have been arrangements to achieve netting of foreign exchange obligations between pairs of counterparties. These bilateral arrangements not only help reduce settlement risk but also reduce the replacement cost risk that arises from open positions between the trade date and the settlement date. If a counterparty fails after a trade has been made but before settlement, a bank is exposed to the cost of replacing the uncompleted deals. This can be reduced if multiple deals are validly netted. But the bigger risks generally arise in the settlement process itself. The sums involved in this process can be reduced still further by multilateral netting and the first clearing house to net foreign exchange transactions multilaterally, ECHO, was established in London last year. A similar US-based scheme called Multinet expects to be operational within a few months. Such multilateral systems do, of course, raise some of the same questions about concentration of risk which is mentioned in relation to derivatives settlement.

In addition, the G20 group of commercial banks has established a project to tackle the issue of foreign exchange settlement risk more comprehensively, and is currently discussing its proposals with the G10 central banks. Its objective is to achieve a form of payment versus payment, a concept similar to that of delivery versus payment in securities markets, but where payment in one currency is linked to the payment in the other. The purest solution to the risks involved in foreign exchange settlement would be a form of payment versus payment which linked together the various national RTGS systems operating in different currencies. This would enable them to exchange matched pairs of payments simultaneously transaction by transaction. As the cost of computing power continues to fall, and as payment systems are open for longer hours within the day, reducing time-zone problems, this vision may well become more achievable. For the immediate future, however, different solutions are needed and RTGS systems are an important part of the approach for netting and other collective arrangements. RTGS systems make final funds in the relevant currencies available to the clearing houses which, in addition, have to use various forms of collateral to cover the time-gaps in the settlement process. RTGS systems therefore speed the process, reduce the periods of exposure, and provide certainty about the precise timing of payment transfers.

The third strand in the G10's strategy is action by central banks. The approach of central banks to foreign exchange settlement risk is initially to draw the industry's attention more positively to the problem—as I am doing now, and, in conjunction with banking supervisors, to encourage an appropriate response both from individual banks and from the industry groups. If progress is not adequate, central banks and banking supervisors will consider what further action is required to bring about the necessary reduction in risk. The G10 governors look for tangible improvement within two years, and will review the situation next spring and again a year later.

Conclusion

Mr Chairman, I have been able this evening to report to you very considerable progress towards reducing payments and settlements risks—especially in relation to our domestic payments system and in important aspects of domestic securities settlement. That is encouraging—so far as it goes! But you would not expect a central banker to leave you with an unambiguously comfortable message, and so I emphasise in conclusion how much remains to be done.

We are still some way from achieving final delivery versus payments in relation to domestic securities; and we have made very little progress up to this point in addressing Herstatt risk. In a world of increasingly interdependent financial markets it is no time to rest on our laurels.

Gilbart may not have cared much for the Bank of England but I rather suspect he would have been four-square behind us on this issue. To quote again from his 'History, Principles and Practice of Banking', he wrote:

> 'Banks are not quite in the same position as other business men; they are custodians of immense sums of the public's money, and any relaxation of ... prudent and cautious methods ... would be very regrettable.'

I think that, like some central bankers, he was a master of understatement.