Payment Systems Oversight Report 2004

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Useful information

The *Payment Systems Oversight Report 2004* is available as a complete document in pdf format on the Bank of England's website:
www.bankofengland.co.uk/financialstability/paymentsystems/oversight/psor2004.pdf.

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Executive summary

Payment systems are fundamental to the functioning of the economy. The Bank of England has responsibility for the oversight of UK payment systems, seeking to ensure they comply with best practice as regards robustness and resilience. This first *Oversight Report* explains how the Bank is discharging its public policy responsibilities in this field.

The *Report* is organised in two parts. The first part describes the oversight framework: the rationale and objectives for oversight of payment systems by central banks (Chapter 1) and the processes and procedures used by the Bank of England in conducting oversight in the United Kingdom (Chapter 2).

The second part explains in more detail some of the issues that have been the focus of the Bank's oversight activities over the recent past (Chapter 3) and outlines some priorities in the year ahead (Chapter 4). Underpinning this analysis is an assessment of the major UK payment systems against the *Core Principles for Systemically Important Payment Systems* (the detail of which is contained in the Annexes to Part II).

Overall, the main UK payment systems exhibit a high level of robustness by international standards. For example, the high-value payment systems in the United Kingdom come close to meeting fully the Core Principles and stand favourable comparison with high-value systems in other countries. There are, however, several areas of ongoing work aimed at further addressing systemic risk in UK payment systems. These were the focus of the Bank of England's oversight activity during 2004 and included:

- an investigation of the risk implications of 'tiering' in the CHAPS high-value payment system;
- work on a *Liquidity Funding and Collateralisation Agreement* for the main UK retail payment systems (BACS and the Cheque and Credit Clearings);
- proposals for the Bank of England to become the 'concentration bank' for certain payments across LCH.Clearnet Ltd's Protected Payments System; and
- an analysis of the risk implications of settlement arrangements for US dollar transactions and high-value 'cycles' in CREST.

Much of this work will continue during 2005 and, in some cases, beyond. Alongside that, the Bank plans to monitor and encourage progress in other areas where its assessment of systems against the Core Principles suggests scope for improvement.

The nature and scale of risks affecting UK payment systems is changing, as past and present initiatives to reduce credit and liquidity risks deliver their benefits. At the same time, consolidation, international integration and increased technical sophistication of the key systems change the focus of risks and create new dependencies. The Bank needs to ensure that its oversight framework responds effectively to this evolution. Priorities for the year ahead will include improving the monitoring of operational risk and strengthening arrangements for co-operative oversight of cross-border infrastructures.

Progress on these priorities will be discussed in next year's *Report*.

Payment Systems Oversight Report 2004

Part I: The oversight framework in the United Kingdom

The primary purpose of this *Report* is to promote transparency and accountability about the way in which the Bank is discharging its public policy responsibilities in the oversight of payment systems. Transparency about the Bank's role is important to other policy authorities in the United Kingdom (in particular HM Treasury and the Financial Services Authority); to the payment system operators themselves and their participants; and to the public more generally given the crucial role payment systems play in the economy. Previously, the Bank has reported on its payment system oversight activities in its six-monthly *Financial Stability Review*.

The publication of this first *Report* aims to ensure that the Bank meets – and, perhaps, extends – emerging best practices in relation to payment systems oversight. For example, the 2003 report from the International Monetary Fund's (IMF) Financial System Stability Assessment of the United Kingdom called for a regular (annual) account of the Bank's activities in payment systems oversight.

The CPSS *Core Principles for Systemically Important Payment Systems* (the "Core Principles")[1] provide further guidance on the responsibilities of central banks in conducting payment systems oversight. They suggest, *inter alia*, that central banks;

- should define clearly and disclose publicly their objectives and policies with respect to systemically important payment systems; and

- should assess compliance of the systemically important payment systems in their jurisdiction with the Core Principles.

This *Report* is structured in two parts so as to fulfil those twin objectives. Part I describes the framework for oversight in the United Kingdom: the rationale for payment systems oversight and the role of central banks (Chapter 1); and the process and procedures used by the Bank of England in conducting payment systems oversight (Chapter 2).

1: CPSS (2001) *Core Principles for Systemically Important Payment Systems*, available at: www.bis.org/publ/cpss43.htm. The Committee on Payment and Settlement Systems (CPSS) is a forum for central banks to monitor and analyse developments in payment, settlement and clearing systems.

Chapter 1: The role of central banks in payment systems oversight

This introductory Chapter explains the importance of payment systems to the economy, the rationale for public oversight of such systems and the role played by central banks in conducting this oversight.[1]

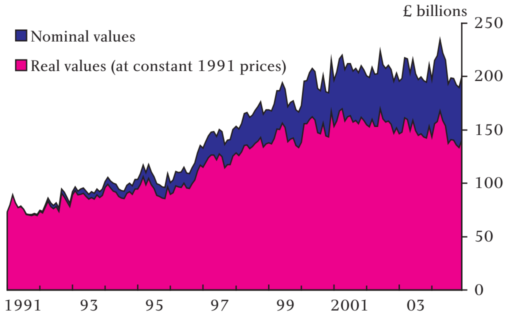
The role of payment systems

A payment is a transfer of value between agents. A *payment system* can then be defined as any organised arrangement for transferring value between its participants. So defined, it is clear that payment systems are fundamental to the functioning of all economies. If transactions are the lifeblood of market economies, then payment systems are the circulation system for these transactions.

This circulation system is as vast as it is important. In 2003, the value passing through UK payment systems was around £130 trillion, about 120 times UK annual gross domestic product (GDP).[2] Or, put differently, an amount equivalent to almost 50% of GDP flows through UK payment systems every business day. Chart 1 plots the nominal and real (inflation-adjusted) daily value of payments passing through the main UK high-value payment system (CHAPS Sterling) since 1991.

The size of these payment flows reflects the variety of transactions which they support, for goods and services as well as financial assets. Some of these transactions involve high-value transfers, typically between financial institutions. These are vital for wholesale financial market activity. For example, they may reflect transfers of funds between banks in response to lending between them, or their customers. Or they may reflect settlement of transactions involving foreign exchange, equities, bonds, money market instruments and other financial assets.

Chart 1:
Average daily value of payments processed in CHAPS Sterling



Sources: APACS and ONS.

A separate set of transactions, greater in number but typically smaller in value, reflect transfers between individuals and/or companies. These too are vital for the functioning of the economy. For example, they include the payment and receipt of wages, salaries and government benefits, Direct Debits, cheques and debit and credit card payments. If any of these circulation systems failed, the functioning of large and important parts of the economy would be affected.

The role of oversight

Why might such systems fail – or why might the circulation system stop? A payment system is, in essence, a network. All networks are susceptible to two distinct types of risk. One is the risk that the failure of one agent spills over to other agents in the network, potentially resulting in gridlock in that system. The large interlocking exposures which arise naturally between participants mean that this risk is often a significant one for payment systems.

The second potential source of risk in a network arises from the dependence of all the network participants on a single supplier – so-called

1: A fuller account is given in Bank of England (2000) *Oversight of Payment Systems*, available at: www.bankofengland.co.uk/fsr/ops.pdf.

2: These figures are based on the value of flows through CHAPS (Sterling and Euro), BACS, the Cheque and Credit Clearings (C&CC), Visa, MasterCard, LINK and the embedded payment arrangements supporting CREST and LCH.Clearnet Ltd.

'single points of failure'. Again, this risk has a particular resonance in a payment system context. Often, payment networks are highly dependent on an agent supplying the infrastructure for payment processing and/or the exchange of payment information.

In both cases, the risks facing the network are systemic – the aggregate risk facing the network is greater than the sum of the risks of each participant were they to operate in isolation. Individual participants may have neither the ability nor the incentive to mitigate fully these systemic risks. Absent outside intervention, system participants will tend to under-invest in systemic risk mitigation. Systemic risk in payment systems has, in effect, the characteristics of a 'public bad'. In consequence, there is a clear rationale for some third party to provide directly, or secure indirectly, the public good of systemic stability in payment systems.

This is where public policy comes into the picture. One possible means of seeking to secure the public good of systemic stability of payment systems is for the public sector to build and operate these systems itself. Historically, this has been the case in a number of countries, with the central bank owning and/or operating at least the high-value payment system.

An alternative approach is for payment services to be provided by the private sector, but with a public authority ensuring systemic risk objectives are met through regulation – or oversight – of the system and/or its participants. This is the direction a number of countries have taken in the recent past. It is this second approach which provides the rationale for payment system oversight from a welfare perspective.

The role of central banks

In practice, the role of payment systems overseer has been assigned to central banks in many countries. In part, this reflects the fact that there is a natural symbiosis between central banks and payment systems. The liabilities of the central bank ('central bank money') are the apex of the payment system as, being risk-free, they represent the ultimate means of discharging obligations between parties. Notes and coin can play this role directly in respect of the general public, while central bank settlement accounts play this role in respect of the banking community. The central bank becomes the *settlement agent*, and its liabilities the *settlement asset*, for the economy.

In the United Kingdom, the Bank of England's liabilities first became a settlement asset in the 18th century in respect of notes, while the Bank's role as settlement agent emerged in the mid-19th century with the advent of settlement accounts for the banking sector. This settlement agent role has continued ever since. Out of this role emerged, with time, a concern with what are today widely acknowledged as the core functions of central banks – monetary stability and financial stability.

So payment systems are the foundation on which central banks' core purposes are built. They are also the bridge between them, for a breakdown of the payment system would disrupt both monetary and financial stability. In continuing to meet its core purpose objectives, therefore, the Bank has a key role to play in overseeing these systems to ensure their robustness.

This role and the Bank's responsibilities in respect of payment systems were formalised in the Memorandum of Understanding (MoU) with HM Treasury and the Financial Services Authority (FSA) agreed in 1997.[3] Many central banks' responsibilities for oversight of payment systems are defined in statute (Table 1). Accompanying these responsibilities are, in some cases, statutory powers of certain kinds – for example, the power to require information or set rules for the system. The UK regime is to some extent unusual as neither responsibilities nor powers for payment systems oversight are defined in statute.[4]

3: For example: "It will fall to the Bank to advise the Chancellor, and answer for its advice, on any major problem inherent in the payments system", from the *Memorandum of Understanding between HM Treasury, the Bank of England and the Financial Services Authority* (1997).

4: The Bank does have some limited statutory responsibility for designating payment systems under the 'UK settlement finality regulations', which implemented the EU *Settlement Finality Directive* (1998) in the United Kingdom. This role is described in Bank of England (2000) *Oversight of Payment Systems* and in Chapter 2 of this *Report*.

Table 1: Central banks' statutory powers of oversight of payment systems

	Australia	Austria	Canada[1]	France	Germany	Hong Kong	Japan	Norway	Singapore[1]	Switzerland[1]	United Kingdom	United States[2]
Central bank's oversight responsibility defined in statute	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		
Systems are obliged to provide information to the central bank	✓	✓	✓	✓		✓		✓	✓	✓		✓
System participants are obliged to provide information to the central bank	✓	✓				✓			✓			✓
Payment systems must be licensed/authorised by the central bank								✓				✓
Central bank must approve, or can impose, payment systems' operational rules	✓	✓	✓			✓		✓	✓	✓		✓
Central bank can set conditions for membership of payment systems[3]	✓			✓		✓		✓	✓			
Enforcement powers (fines, civil or criminal sanctions)	✓	✓	✓			✓		✓	✓	✓		✓

1: Central bank statutory powers apply only to a sub-set of payment systems, for example those considered systemically important.

2: The Federal Reserve Board has various supervisory responsibilities with regard to certain payment and settlement systems, such as those chartered as banking organisations. For other systems, the Board has no such jurisdiction. The Board oversees systems which settle over US$5 billion gross per day, and *vis-à-vis* which it has legal or operational responsibilities. The Board also has statutory authority to oversee and supervise Federal Reserve Banks and their provision of payment services. Powers applicable therefore depend on the organisational character of a payment or settlement system, operational relationships with the system, and whether the system is owned or operated by the Federal Reserve.

3: This is distinct from access conditions for central bank settlement accounts.

Chapter 2: The oversight process in the United Kingdom

This Chapter explains the framework in which payment systems oversight is conducted in the United Kingdom.

The objectives of payment systems oversight

The main objective of the Bank's payment systems oversight is to assess and, if necessary, seek to ensure mitigation of risks to the wider economy – 'systemic risk'. It is this risk which payment systems operators and participants may not themselves recognise and mitigate sufficiently.

Although the Bank's primary focus is systemic risk reduction, efficiency considerations also need to be weighed. The Bank seeks to promote an efficient payment and settlement infrastructure when this does not conflict with its primary responsibility for systemic risk mitigation. The Bank also recognises that designing and operating a payment system to minimise systemic risk would be counterproductive if the system thereby became so expensive or impractical to use that payment traffic migrated to less safe alternatives.

The scope of oversight

The Bank's payment systems oversight focuses on weaknesses in risk management which would have the greatest potential impact on the financial system as a whole. Box 1 provides a summary of the systems the Bank currently oversees and some of the key characteristics which determine the intensity of its oversight.

The Bank focuses most attention on 'wholesale' payment systems. For example, it oversees CHAPS Sterling and CHAPS Euro, the United Kingdom's large-value interbank payment systems, and the embedded payment arrangements supporting CREST, the settlement system for many UK-issued securities. The Bank's oversight also covers the embedded arrangements for transfer of funds between LCH.Clearnet Ltd – the United Kingdom's central counterparty for certain financial and commodity market transactions – and its members. In addition, and in co-operation with other central banks, the Bank contributes to the oversight of the Continuous Linked Settlement (CLS) foreign exchange settlement system.

Of the UK 'retail' payment systems, the Bank focuses on BACS (which processes Direct Debits, Direct Credits and standing orders), the Cheque and Credit Clearings (C&CC), LINK (the ATM network operator) and the debit and credit card systems operated by Visa Europe, MasterCard Europe and S2 Card Services (which manages the Maestro, formerly Switch, and Solo debit card schemes). The Bank does not consider other UK payment systems to be of sufficient importance to the economy currently to warrant formal oversight.

In addition, the Bank has oversight relations with a number of core infrastructure suppliers to the payment schemes – in particular, SWIFT, which provides messaging services supporting CHAPS, CREST and many other market infrastructures; Voca, which operates the infrastructure that supports BACS payments; and also the Bank's own Banking Services area, which operates the RTGS infrastructure that is at the heart of the interbank settlement for CHAPS, as well as being integral to two of the three embedded payment arrangements supporting CREST.

To have a comprehensive view of the payment and settlement infrastructure, the Bank also needs to understand the role played by some major banks which settle payments for a large number of other banks. In many UK payment systems – including CHAPS, CREST, BACS and the C&CC – only a small number of banks are settlement members. In some respects, the largest of these settlement member banks have themselves the characteristics of payment systems.

Standards for overseen systems – the Core Principles

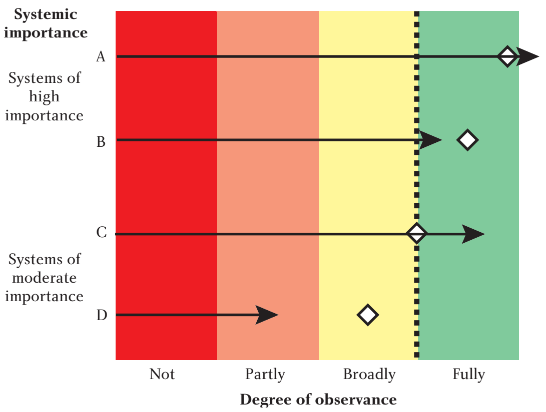
The foundation for the Bank's oversight is an analysis of credit, liquidity, operational and legal risks in the various UK payment systems. Specifically, the Bank assesses system operators' management of these risks against the internationally-recognised benchmark provided by the *Core Principles for Systemically Important Payment Systems*.[1] These Core Principles provide a set of minimum standards for payment systems, covering legal risks (Core Principle I), financial risks (Core Principles II to VI) and operational risks (Core Principle VII), as well as efficiency (Core Principle VIII), access criteria (Core Principle IX) and governance (Core Principle X). The Annexes to Part II of this *Report* provide detailed assessments of the major UK payment systems against the Core Principles.

For those systems judged to be most systemically important – CHAPS Sterling, CHAPS Euro and the sterling embedded payment arrangements supporting CREST settlement – the Bank seeks full observance of the Core Principles. For other systems, the Core Principles still provide a useful benchmark, but it may not be necessary to satisfy all of them. Figure 1 shows how the Bank's expected degree of compliance with a particular Core Principle is proportionate to the systemic importance of the system.

The Core Principles offer only a minimum standard which the most significant payment systems should seek to exceed. In some cases, national and international standards of best practice have evolved since the Core Principles were published – for example, Core Principle VII which covers contingency planning, or Core Principle X on governance. The standards expected for payment systems should reflect this evolution, and the Bank may seek compliance with a more specific or higher standard in these cases.

Payment system operators, and the Bank as overseer, cannot guarantee that there will never be operational failures of payment systems, still less that payment system participants will never fail. Instead, the Bank's approach is to encourage payment system operators to aim for 100% availability, to have no single point of failure and to have considered and planned how they and their participants would manage and recover in the event of an interruption of service or default of a settlement member. These contingency arrangements are particularly important when there is no readily available alternative means of making payments of the same value or volume.

Figure 1: Compliance with the Core Principles



Degree of observance of the Core Principle by the system.

Minimum standard for full compliance.

Standard currently sought by the Bank.

System A: Fully observes Core Principle and exceeds standard sought by the Bank.

System B: Fully observes Core Principle but further improvements are needed to meet the standard sought by the Bank.

System C: Fully observes Core Principle and exceeds the standard sought by the Bank.

System D: Bank seeks only broad compliance but system falls short of this.

Many other central banks use the Core Principles as a benchmark. This has helped to ensure a set of common objectives across central banks, facilitating the efficient and effective co-operative oversight of international systems such as CLS and TARGET (of which CHAPS Euro is a part). The Core Principles also offer the basis for a level playing field between similar payment systems in the same or different countries. For that reason, they are the foundation of the Bank's oversight in general, and of this *Report* in particular.

Implementing oversight

The Bank's oversight responsibilities are discharged by the Market Infrastructure Division within the Bank's Financial Stability area. There is a clear organisational separation between staff

1: The Core Principles can be found in the Annexes to Part II of this *Report*. The full text of the Core Principles and guidance on their implementation are available on the BIS and other websites (CPSS (2001) *Core Principles for Systemically Important Payment Systems*, available at: www.bis.org/publ/cpss43.htm).

responsible for oversight and other Bank of England staff who operate payment systems or represent the Bank as a member of these systems.[2] This separation is intended to avoid conflicts of interest and ensure that the Bank's oversight activities remain independent.

The Bank has access to information as an operator of payment system infrastructure (for example, the Real-Time processor at the heart of CHAPS), as a provider of settlement services over accounts held at the Bank, and/or as a member of, and participant in, some systems. The information the Bank requires for its oversight is, however, gathered directly from the payment system operators. The most important channels for information gathering are normally meetings with the system operators, their internal policy papers and statistics on their operational performance.

For most of the systems it oversees, the Bank has regular bilateral meetings with the company manager, Chief Executive Officer (CEO) or equivalent, usually quarterly. So that its objectives, assessments and expectations are clear, the Bank writes to each system after these meetings setting out the main issues discussed and the conclusions. It encourages CEOs and company managers to share these letters with directors and colleagues. They are intended, however, to be confidential to the system operators.

Where the Bank judges there to be a case for an enhancement in risk management by a system, it seeks to persuade the management and owners of the case for change. The following sections of this *Report*, and the Core Principle assessments in the Annexes to Part II, describe some of the areas where the Bank is encouraging change. Examples include the work to introduce a *Liquidity Funding and Collateralisation Agreement* for BACS and the C&CC; the interbank settlement arrangements supporting US dollar payments in CREST; and the work of the Bank to become LCH.Clearnet Ltd's concentration bank for sterling and euro payments. Often, there is advantage in such change for owners and users of a system, as well as for the financial system as a whole. This is reflected in the fact that all of the above initiatives are supported by the systems to which they pertain.

The Bank does not have statutory powers over payment systems or their participants. However, under the *Financial Markets and Insolvency (Settlement Finality) Regulations* (1999), which implemented the EU *Settlement Finality Directive* (1998) in the United Kingdom, the Bank has the statutory power to 'designate' UK payment systems so that their relevant rules are protected from legal challenge should a participant become subject to insolvency proceedings. Payment systems do not require designation in order to operate and the Bank cannot oblige payment systems to seek it. Designation does, however, require systems to inform the Bank of certain changes to their rules or guidance and provide advance notice of any proposal to amend, revoke or add to their default arrangements. The Bank designated CHAPS Sterling and CHAPS Euro in May 2000 and CLS in August 2002.[3]

A number of UK payment systems settle interbank obligations by means of credits and debits to accounts at the Bank of England.[4] Settlement membership of many payment systems therefore depends on having a settlement account at the Bank.[5] The Bank can attach contractual conditions to its agreement to act as settlement agent. If these conditions were considered too onerous, however, this could encourage use of alternative settlement agents, thereby undermining the Bank's risk-reduction objectives.

2: These latter staff are part of the Banking Services area of the Bank and report to a different Executive Director (the Chief Cashier). The Bank has a seat on the Boards of CHAPSCo, BPSL, Voca and the Cheque and Credit Clearing Company, in addition to a seat at the Council of APACS (the UK payments trade association); it is represented on these boards by Banking Services staff.

3: The Bank also advised the FSA on the designation of CREST in August 2001 and LCH.Clearnet Ltd in July 2003.

4: For example CHAPS Sterling and CHAPS Euro, the sterling and euro embedded payment arrangements supporting CREST settlement, BACS, the Cheque and Credit Clearings, and LINK.

5: The Bank's policy on provision of settlement accounts is set out in Bank of England (2002) *Bank of England Settlement Accounts*, available at: www.bankofengland.co.uk/financialstability/paymentsystems/boesettleaccs021128.pdf.

Co-operation with the FSA and other UK authorities

In promoting safe and efficient payment systems, the Bank co-operates with a number of other UK public authorities. The Bank's oversight of the payment arrangements for CREST and LCH.Clearnet Ltd must dovetail with the supervision of these institutions by the FSA.[6] As supervisor of CRESTCo and LCH.Clearnet Ltd, the FSA is responsible for ensuring that these firms comply with the recognition requirements laid down under the *Financial Services and Markets Act* (2000).[7]

The embedded sterling payment arrangement supporting CREST settlement is used to settle a higher aggregate value of payments than any other UK payment system, while the smooth functioning of LCH.Clearnet Ltd's Protected Payments System (PPS) helps underpin the company's operations as the United Kingdom's central counterparty for certain financial and commodity market transactions. CREST's sterling and euro embedded payment arrangements are closely integrated with the CHAPS system: liquidity can be transferred freely between the two, while both rely (in normal operational mode) on real-time access to Bank of England accounts through the Bank-operated Real-Time Gross Settlement (RTGS) infrastructure. CHAPS is also important to the smooth functioning of the PPS. Oversight of CREST and LCH.Clearnet Ltd contributes to fulfilling the Bank's responsibility under the 1997 tripartite MoU to take an overview of the stability of the financial system as a whole.[8]

An explanation of the oversight of embedded payment arrangements is contained in Box 2. This box considers how the *Core Principles for Systemically Important Payment Systems* map into the CPSS-IOSCO recommendations for securities settlement systems and central counterparties (the CPSS-IOSCO "Recommendations").[9] The *Recommendations for Securities Settlement Systems* were published in November 2001, while the *Recommendations for Central Counterparties* were published in November 2004. The Bank and FSA both contributed to the recent finalisation of the *Recommendations for Central Counterparties*.

Exchange of information between the Bank and the FSA can help both authorities to fulfil their responsibilities effectively. An example of joint work by the Bank and FSA was their joint review of LCH.Clearnet Ltd's risk management in 2001. The FSA and Bank each intend also to participate in co-operative oversight and information-sharing arrangements with other European central banks and regulators with an interest in the oversight of LCH.Clearnet Group Ltd and, separately, Euroclear (of which CRESTCo is a subsidiary). In assessing and encouraging the UK financial sector's readiness to respond to major operational disruption, the Bank's overseers and FSA supervisors have worked together in a variety of fora, including the Markets and Exchanges Regulatory Liaison and Information Network (MERLIN).

Co-operation with the FSA is also important for the analysis and assessment of the role of major correspondent and custodian banks in the payment system. Surveys suggest that the total value of payments 'internalised' on the books of the largest banks (because both parties to the transaction are customers of the same bank) exceeds the aggregate value settled in all of the United Kingdom's retail payment systems. This dependence on a few large correspondent banks is in part a consequence of the relatively small number of banks which are settlement members of UK payment systems (see Chapter 3).

The public policy responsibilities of the Bank as overseer of payment systems are influenced by the governance, the level of innovation and the criteria for access to these systems. These are

6: The roles of both the FSA and Bank are recognised in the *Financial Markets and Insolvency (Settlement Finality) Regulations 1999* (see above): the FSA is the designating authority for Recognised Clearing Houses (RCH), but the Bank must advise the FSA in cases where a payment system is embedded within the RCH. Both CREST and LCH.Clearnet Ltd have been designated by the FSA following consultation with the Bank.

7: Details of the requirements are contained in the FSMA (Recognition Requirements for Investment Exchanges and Clearing Houses) Regulations 2001.

8: *Memorandum of Understanding between HM Treasury, the Bank of England and the FSA* (1997), available at: www.bankofengland.co.uk/legislation/mou.pdf.

9: The CPSS (Committee on Payment and Settlement Systems) is a forum for central banks to monitor and analyse developments in payment, settlement and clearing systems. IOSCO is the International Organisation of Securities Commissions.

among the issues being examined in the Payment Systems Task Force chaired by the Office of Fair Trading (OFT), which was set up following the Chancellor's Pre-Budget Report in November 2003.[10] The Task Force offers an opportunity to consider and push forward improvements to the main UK payment systems, in a way that potentially brings both risk-reduction and efficiency benefits for consumers and the financial sector. It includes representatives from consumer and business associations, as well as UK payment systems. The Bank is participating in the Task Force as an observer.

International co-operative oversight

For some systems, the Bank of England is one of many central banks with an oversight interest because the system serves markets in multiple countries. In the interests of efficiency, the Bank has agreed in a number of cases to delegate some of the contact with the system and information gathering to another authority. This delegation of activities is without prejudice to the responsibilities of the Bank for oversight of UK payment systems, or the responsibilities of other authorities involved in the co-operative oversight process.

The co-operative oversight frameworks that have been devised for Euroclear group and LCH.Clearnet Group Ltd, following the mergers that created them, are the most recent additions to the list of international co-operative arrangements. These arrangements will come into effect in the coming year.

Co-operative arrangements for CHAPS Euro, by contrast, are long-standing. It forms part of TARGET (the 'Trans-European Automated Real-Time Gross Express Transfer System') which enables the settlement of cross-border euro payments in real time across the euro-area, Denmark, Sweden and the United Kingdom. The smooth functioning of CHAPS Euro depends on the ability to transfer funds in real time between the euro area and Bank of England accounts. The Bank participates in a co-operative oversight arrangement led by the European Central Bank (ECB).

The CHAPS system, and accounts provided by the Bank of England, also support the operation of the Continuous Linked Settlement (CLS) system. Connecting with RTGS (or equivalent) systems in 15 countries, CLS allows Payment versus Payment (PvP) settlement of foreign exchange transactions. To ensure that liquidity, operational and other risks in CLS are appropriately managed, the Bank takes part in a co-operative oversight framework led by the US Federal Reserve.

While not a payment system, SWIFT provides messaging services supporting CHAPS, CREST, CLS and around 80 other market infrastructures around the world. SWIFT's headquarters are in Belgium and the National Bank of Belgium leads a co-ordinated oversight arrangement that involves the Bank of England, the Bank of Japan, the ECB, the US Federal Reserve and other G10 central banks.

The number of systems subject to international co-operative oversight may increase as cross-border consolidation of infrastructure continues (see Chapter 4). The Bank has already consulted foreign authorities in its oversight of Visa and MasterCard, although there is not currently a formal co-operative oversight arrangement in place. The CPSS provides a forum in which to discuss the broader principles of co-operative oversight.

The Bank's work within these various international co-operative oversight frameworks, as well as its domestic oversight activities, are discussed in Part II of this *Report*.

10: See www.oft.gov.uk/Business/Payment+systems+task+force/default.htm.

Box 1: Intensity of oversight

The Bank's November 2000 report on *Oversight of Payment Systems* explained that the intensity of the Bank's oversight is proportionate to its assessment of the systemic risks posed by a system. This box describes some of the criteria determining that assessment.

Disruptions to financial markets

One important determinant of the risk posed by a payment system is the size, relative to participants' balance sheets, of any credit and liquidity exposures between participants. If exposures are sufficiently large, the failure of one participant may result in losses or liquidity shortfalls being transmitted through the payment system. The size of these credit and liquidity exposures is determined by a combination of the **value of payments** processed and aspects of the **design of the system**.

The largest value systems overseen by the Bank are, for the most part, designed to prevent large credit exposures arising. The conversion of CHAPS to a Real-Time Gross Settlement (RTGS) system in 1996, and of CREST's sterling and euro settlement to a Delivery versus Payment (DvP) model in 2001, eliminated the large intraday credit exposures that had previously arisen between settlement banks in those systems. The launch of CLS in 2002 allowed foreign exchange transactions to be settled on a Payment versus Payment (PvP) basis, thereby removing the 'principal risk' (a form of credit risk) associated with these transactions.[1]

Although some credit exposures do exist in other UK payment systems – notably in BACS and the Cheque and Credit Clearings (C&CC), where these exposures are uncapped – actual exposures have historically been relatively small compared with the balance sheets of their participants. As Table 2 illustrates, values in BACS and the C&CC are together around 5% of those processed in CHAPS. Values transferred through LINK and the debit and credit card systems overseen by the Bank are smaller still.

The values in the Protected Payments System (PPS) of LCH.Clearnet Ltd are also a fraction of those in CHAPS and CREST.[2] However, the design of the PPS system differs from most others overseen by the Bank in a fundamental way. LCH.Clearnet Ltd is both one party to every payment made through the payment arrangement and, at the same time, is responsible for the operation of that arrangement. There are default procedures in place should a member fail to pay, but if a PPS bank were to fail during the day this could cause LCH.Clearnet Ltd itself to incur losses or experience liquidity pressures. There could also be knock-on disruptions to financial markets if members themselves did not receive expected payments from LCH.Clearnet Ltd. LCH.Clearnet Ltd's peak exposure to one or more PPS banks was greater than its own capital on around half of the days in 2004.

Core Principles II to VI address the question of how financial risks associated with participation in a payment system, including risks arising from the potential failure of a participant to meet its obligations, or from the failure of the settlement agent, should be made transparent, managed and mitigated. An assessment of the main UK payment systems against the full set of Core Principles is included in the Annexes to Part II of this *Report*.

Another potential source of disruption to financial markets might arise from interruption of payment processing and settlement due to an operational problem. Exposures between participants in

1: A failure by a settlement member to make a CLS pay-in could still cause a delay to settlement and/or pay-outs and hence a loss of liquidity in the large-value payment systems used to make payments to and from CLS. Limiting credit risk between settlement banks can place high demands on banks' ability to manage their liquidity intraday. Because payments are settled in central bank money in real time in CHAPS and at the end of frequent cycles in CREST, these systems require members to hold sufficient high-quality collateral to ensure access to liquidity provided by the Bank of England. CLS settlement members are required to have funds available to make pay-ins according to a tight timetable (although a process known as 'Inside/Outside' swaps reduces pay-in requirements and liquidity pressures at the cost of reintroducing a small amount of principal risk).

2: The multilateral netting provided by a central counterparty reduces the gross bilateral exposures between financial market participants to smaller net exposures between each member and the central counterparty. In turn, the market risk arising from those exposures is managed through the collection of initial margin and regular payments to adjust for variations in prices and positions. It is these amounts, as well as cash settlements of certain commodities and derivatives trades, that are transferred through the PPS.

payment systems may build up if such an outage prevented timely settlement of existing trades. This accumulation of exposures is likely to be especially important for the large-value transactions associated with financial markets, such as payments within CHAPS, the embedded payment arrangements supporting CREST settlement, LCH.Clearnet Ltd's PPS and CLS.

For example, a disruption to CHAPS could prevent timely settlement of a number of types of transaction, including the repayment of interbank loans. A failure of the embedded payment arrangements that support CREST could prevent the settlement of high-value financial asset trades, including those associated with the Bank's open market operations (OMOs), thereby complicating the operation of monetary policy.[3] A failure of the PPS would cause exposures between members and LCH.Clearnet Ltd to build up, increasing the vulnerability of the central counterparty to the default of a participant. A disruption to CLS could cause a delay to pay-outs and hence a loss of liquidity in payment systems in 15 currencies; and it could also cause exposures to build up between counterparties in respect of trades awaiting settlement. Table 2 lists some of the key wholesale market transactions processed in CHAPS, CREST, CLS and the LCH.Clearnet Ltd PPS.

The likelihood and severity of operational problems of these types will depend on the resilience of the infrastructure for these systems and the adequacy of their back-up arrangements. Some minimum standards for management of operational risk are set out in Core Principle VII. Chapter 4 of this *Report* discusses the management of operational risk in detail, while the Annexes to Part II provide an assessment of each of the major UK systems against Core Principle VII.

Disruptions to the wider economy

The values transferred in the United Kingdom's retail payment systems are probably not sufficient, at least in normal operational circumstances, to create credit exposures that would threaten the solvency or liquidity of their settlement members. These systems do, however, process large volumes of payments which play a key role in the smooth functioning of the economy. So the failure of such a payment system may lead to widespread adverse effects for consumers and businesses.

The extent of disruption to the economy arising from a retail payment system failure will be determined by the **types, values and number of payments affected**. Some payments may be more time-critical than others. For example, some payments made by businesses and individuals in CHAPS may require real-time or same-day settlement in order to avoid financial losses being incurred – for example, the disruption caused by a house purchase failing to complete. Many payments in BACS may also be time-critical to their recipients – for example, the payment of benefits or salaries. As well as delaying the settlement of existing transactions, a payment system problem could also prevent or discourage new transactions. This might, for example, be the case if a card payment network were not functioning, or cheques were taking an unacceptably long time to clear.

Other things being equal, the larger the number of time-critical payments processed by a system, the larger would be the adverse effects of a disruption to that system. As shown in Table 2, BACS is the most widely used system in terms of numbers of payments. Significant costs would be incurred by at least some users of BACS in the event of a delay to payments, particularly for salaries and benefits. High numbers of payments are also processed through the card networks and the C&CC, although these are typically less time-critical. The number of payments processed in CHAPS is much smaller, but a higher proportion is likely to be time-critical.

Substitute payment mechanisms

The adverse effects of a payment system outage – both in terms of disruption to the financial system and the economy more generally – will be mitigated if there are **substitute means of making**

3: Though OMO trades involving securities issued in one of the International Central Securities Depositories (Euroclear or Clearstream), in one of the local Central Securities Depositories (CSDs) via the 'Correspondent Central Banking Model' (CCBM) or via links between CSDs could still settle. (The CCBM enables a bank to obtain funds from its home central bank against collateral located in a CSD located elsewhere in the TARGET area, using the local national central bank as its custodian.)

payments. Table 2 lists some possible substitute payment arrangements for each of the systems. For example, many debit and credit card transactions could be made using an alternative card and network, by cheque or by cash. Likewise, in the event the LINK ATM network failed, customers could continue to withdraw cash from their own bank's ATMs or use alternative withdrawal channels (such as cashback at point of sale or at bank branch counters).

Some systems have less obvious substitutes, particularly in the short term. This is especially the case if they process a large volume of payments, which would either require extensive manual processing if they were to be handled by another system, or which other systems may simply not have sufficient capacity to process. The 16 million Direct Debits, Direct Credits (including salary payments) and standing orders processed by BACS each day fall into this category.

If a problem at the Bank of England prevented CHAPS payments from being processed normally, it is possible for CHAPS Sterling to revert to a net settlement system with payment messages exchanged between members across the SWIFT network in 'RTGS bypass mode'. Although this would cause additional intraday credit exposures between members of the system, all payments could still be settled with finality on the same day. Contingency arrangements also exist for payments to CLS to be made manually and achieve intraday finality. In the event of a failure that prevented CHAPS Sterling from operating in bypass mode, however, a significant volume of CHAPS payments would have to be delayed.

There are no obvious short-term substitutes for CREST. Some financial institutions could, however, potentially switch at least some of their trading to other markets, and in the event of a disruption to part of the embedded payment arrangement that did not affect CREST's own systems, it may be possible for CREST to continue to settle in 'recycle mode'. In this situation, CREST is allowed, exceptionally, to re-use liquidity on accounts at the Bank to continue securities settlement, rather than having to seek regular authentication of liquidity usage from the Bank.

If the PPS were not functioning as normal, and if LCH.Clearnet Ltd could still calculate PPS obligations, contingency arrangements could be invoked so that the relatively small number of payments could be settled via alternative means – for example, in the event of a SWIFT outage, payment instructions could be sent by fax and processed manually.

If CLS failed, this need not in itself halt foreign exchange trading. Some counterparties might reduce trading in order to limit principal risk, but the most critical deals could still be settled outside CLS, albeit perhaps with additional principal risk.

Ranking payment systems

All the above factors have a bearing on the systemic importance of a system and so need to be weighed in determining the intensity with which the Bank conducts its oversight of the various UK payment systems. These factors fall into five broad categories: the value of transactions; the number of transactions; the design of the system; how critical the payment type is; and the availability of substitute payment media.

At present, the Bank makes a largely qualitative assessment of these factors when ranking payment systems' systemic importance. The result is a particular focus on CHAPS and CREST, with BACS, CLS and LCH.Clearnet Ltd on the next rung, followed by the C&CC, then LINK and the debit and credit card schemes. The Bank is currently undertaking further work which might better enable quantitative judgements on the systemic importance of UK payment systems (see Chapter 4).

Table 2: Volumes, values and main payment types (daily averages, 2004)[1]

	Volume	Value (£ million)[2]	Important payment types	Most likely short-term substitutes
Payment systems				
CHAPS			● Settlement of financial market transactions ● House purchases ● Other time-critical payments ● CLS pay-ins and pay-outs	● CHAPS Sterling bypass mode ● Manual procedures for making a small number of payments ● Possible use of correspondent banking arrangements for some other payments
Sterling	111,502	206,093		
Euro	25,750	153,493		
BACS	18,120,354	11,352	● Salary and benefit payments ● Bill payments by Direct Debit	● Perhaps some limited scope for switching to other instruments in the short term – eg cheques or cash
C&CC[3]	8,234,419	5,046	● Payments for goods and services by consumers and businesses ● Bill payments and small financial transactions (eg payments into savings accounts) ● Person-to-person payments	● BACS ● Card networks ● Cash
Visa (credit and debit cards)[5]	14,909,000	806	● Payments for goods and services by consumers and businesses	● Cheques ● Other card networks ● Cash
MasterCard[4] (credit and debit cards)[5]	13,743,000	685	● Payments for goods and services by consumers and businesses	● Cheques ● Other card networks ● Cash
LINK[5]	6,126,030	201	● Withdrawal of cash using an ATM not operated by the customer's own bank	● Own bank's ATMs ● Other cash withdrawal channels
Embedded payment arrangements				
CREST[6] (embedded payment arrangements)			● Settlement of gilts, equities and money market instruments (including in respect of OMOs and repo market transactions more generally)	● Increased free-of-payment transfers of securities could be accommodated within CREST but with increased principal risk.
Sterling		267,497		
US dollar		731		
Euro		1,222		
Total CREST	252,652	269,450		
LCH.Clearnet (PPS)[7]			● Settlement in respect of cash margin payments ● Payments for commodity deliveries ● Cash settlements ● Default fund contributions	● If disruption does not prevent calculation of settlement obligations, contingency payment procedures may be invoked. ● Contingency algorithms can be used to calculate obligations if usual mechanisms are unavailable.
Sterling	182	401		
US dollar	155	670		
Euro	126	506		
Other	244	87		
Total LCH	707	1,664		
Foreign exchange settlement system				
CLS			● Settlement of foreign exchange trades	● Correspondent banking arrangements in the relevant countries but with increased principal risk
All currencies	62,000	395,000		
Of which sterling[8]	10,000	72,000		

Sources: APACS, Bank of England, CLS Bank International, CRESTCo, LCH.Clearnet Ltd and LINK Interchange Network Ltd.

1: Except where indicated.

2: US dollar, euro and 'other' figures are shown as sterling equivalent.

3: Volumes include items drawn on other branches of the same bank. Values only include those drawn on other banks.

4: Includes UK Maestro and Solo transactions.

5: Data for 2003 are shown.

6: Value figures refer to cash movements within CREST (and will therefore include the value of transactions settled between CREST members who use the same settlement bank). The comparable volumes figure is only available at an aggregate level.

7: Figures for LCH.Clearnet Ltd refer to the sum of all (net) payments between LCH.Clearnet Ltd and its members through the PPS. Volume figures are for August 2004.

8: Trades in which one leg is denominated in sterling.

Box 2: The oversight of ‘embedded’ payment arrangements

In addition to its oversight of CHAPS and significant retail payment systems, the Bank also oversees the payment arrangements that support CREST, the United Kingdom’s securities settlement system; and LCH.Clearnet Ltd, the central counterparty. Both are key elements of UK market infrastructure, and as such both are potential sources of systemic risk. As with the oversight of other systems, the Bank’s objective is to ensure that sufficient weight is given to systemic risk reduction and risk management.

CREST sterling settlement generates interbank transfers of around £225 billion each day – greater than the daily turnover in the CHAPS Sterling system. Euro and US dollar settlement generates much smaller, though still substantial, payment values (Table 2). While total payment transfers made through LCH.Clearnet Ltd’s Protected Payments System (PPS) are modest by comparison, at around £1.7 billion per day, they nonetheless represent a critical element in the practical implementation of LCH.Clearnet Ltd’s counterparty risk management. The PPS provides for funds transfers in sterling, euro, US dollar and nine other major currencies (Table 2).

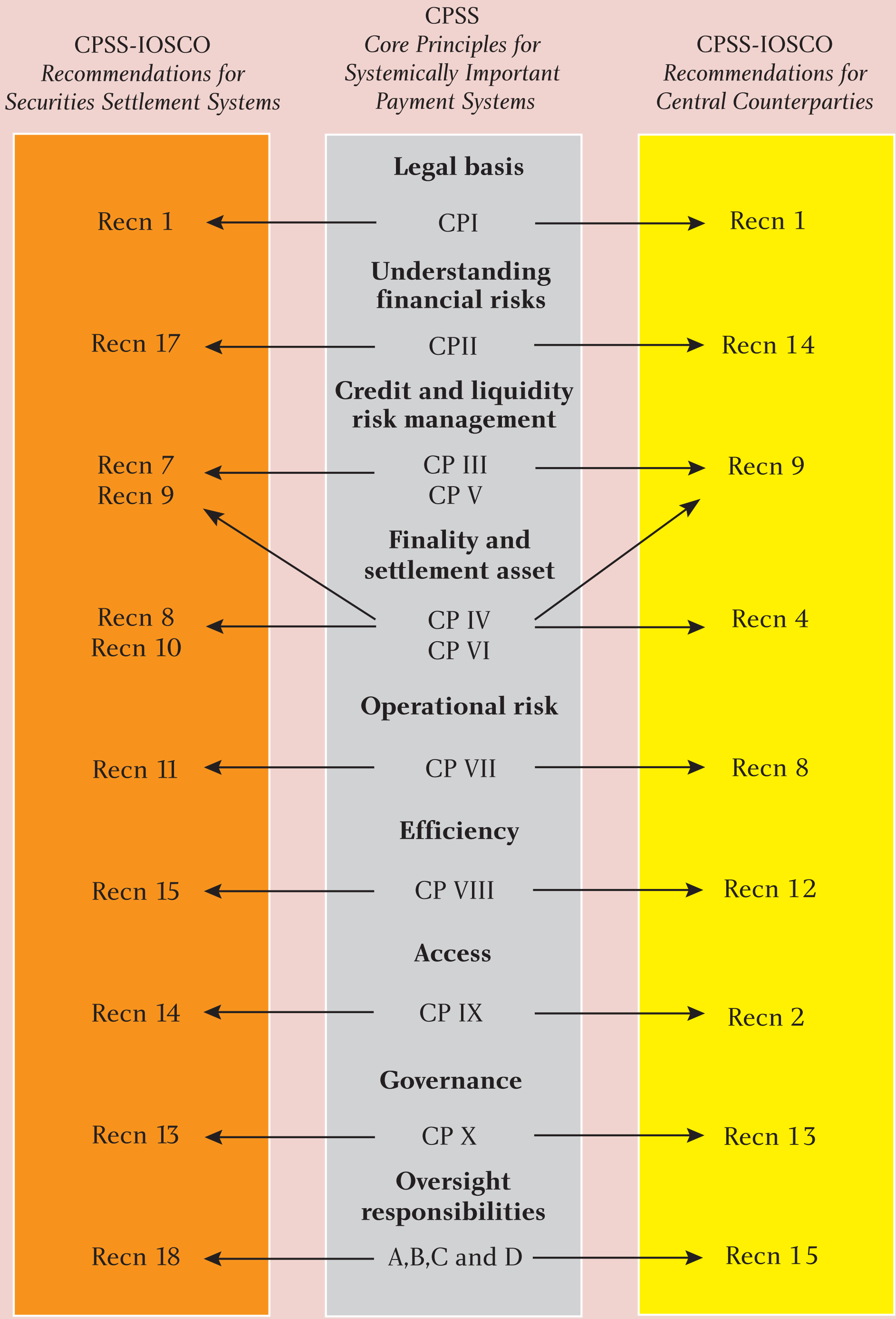
Since the publication of the Core Principles, central banks and securities regulators have jointly developed recommendations for the safe and efficient design and operation of securities settlement systems and, most recently, central counterparties.[1] These CPSS-IOSCO “Recommendations” cover the management of the main categories of risk to which the systems and their members are exposed in providing the function of settlement or central counterparty clearing. Although narrower in scope than the Recommendations, the Core Principles contain useful benchmarks for the embedded payment arrangements within securities settlement systems and central counterparties. Therefore, observance of the appropriate Core Principles by those arrangements contributes to the ability of the system as a whole to meet the CPSS-IOSCO Recommendations.

Against that background, the Bank has undertaken a mapping exercise between the Core Principles and the CPSS-IOSCO Recommendations. For some of the Core Principles, the read-across is very direct. For example, for a securities settlement system to be able to demonstrate full compliance with the CPSS-IOSCO Recommendation for Securities Settlement Systems (RSSS) on Delivery versus Payment (RSSS 7), its embedded payment system needs to be able to offer funds transfers that are final. That, in turn, means compliance with Core Principle IV. There is a similarly direct read-across between Core Principle VI and RSSS 10, both of which relate to the quality of cash settlement asset used. For other Core Principles – for example Core Principle I on legal underpinnings – a high degree of compliance will be a necessary, but not sufficient, condition for achieving a high degree of compliance with the relevant CPSS-IOSCO Recommendation.

Figure 2 shows how the analysis and assessment of an ‘embedded’ payment system against the Core Principles maps into the analysis and assessment of a securities settlement system or central counterparty clearing house against the relevant set of Recommendations. Annexes B and C to Part II of this *Report* contain summary assessments of the embedded payment arrangements supporting CREST and LCH.Clearnet Ltd against the Core Principles, with particular reference to how these feed through to the broader assessments of CREST and LCH.Clearnet Ltd against the relevant CPSS-IOSCO Recommendations. The last full assessment of the CREST system against the CPSS-IOSCO Recommendations was conducted by the IMF, in conjunction with the Bank and the FSA, as part of the Financial System Stability Assessment of the United Kingdom (Box 3). LCH.Clearnet Ltd has yet to be assessed against the CPSS-IOSCO *Recommendations for Central Counterparties*, the final version of which was published in November 2004.

1: CPSS and IOSCO (2001) *Recommendations for Securities Settlement Systems* and CPSS and IOSCO (2004) *Recommendations for Central Counterparties*.

Figure 2:
Mapping of the CPSS-IOSCO Recommendations for Securities Settlement Systems and Central Counterparties against the Core Principles[1]



1: In addition to the ten Core Principles, the *Core Principles for Systemically Important Payment Systems* also listed four 'responsibilities of the central bank in applying the Core Principles' (Oversight responsibilities A-D). These cover: public disclosure of the central bank's oversight role and policies (responsibility A); ensuring the systems operated by the central bank comply with the Core Principles (responsibility B); overseeing compliance with systems not operated by the central bank (responsibility C); and co-operation with other relevant authorities (responsibility D).

Part II: Assessing payment systems in the United Kingdom

Risks arising in payment systems are to some degree common across all systems. The main themes of the Bank's oversight work – for example, an assessment of the management of credit and liquidity risks (the focus of Core Principles II to VI), the management of operational risks and business continuity planning (Core Principle VII), and effective governance (Core Principle X) – are also therefore common across systems.

Table 3 provides a schematic overview of the Bank's assessment of a number of key domestic payment systems against the benchmark of the CPSS *Core Principles for Systemically Important Payment Systems* (the "Core Principles"). The Annexes to this part of the *Report* contain the Bank's detailed assessment of the main UK payment systems. These assessments help identify and prioritise issues which have been, and will continue to be, the focus of the Bank's oversight activity.

Based on those assessments, Chapter 3 provides a report on key oversight developments during 2004, organised largely on a system-by-system basis – that is, looking down the columns of Table 3. It focuses in particular on the Core Principles relevant to settlement risk and operational risk. The chapter also reports on the progress made following two recent external evaluations of the financial infrastructure in the United Kingdom (the IMF's Financial System Stability Assessment of the United Kingdom[1] in 2003 and the report of the Task Force on Major Operational Disruption in the Financial System[2] – chaired by Sir Andrew Large, the Bank of England's Deputy Governor for Financial Stability).

Chapter 4 reports on the agenda for oversight in 2005, organised largely on a risk-by-risk or thematic basis – that is, looking along the rows of Table 3. This suggests a number of areas where further action might be prioritised to mitigate risks or ensure compliance with the Core Principles, including further reducing settlement and operational risk, as well as governance and co-operative oversight. The intention is that in next year's *Oversight Report*, as part of the process of transparency and accountability, the Bank's oversight role and activities will be assessed against the forward agenda set out in this year's *Report*.

1: IMF (2003) *United Kingdom: Financial System Stability Assessment*, available at: www.imf.org/external/pubs/ft/scr/2003/cr0346.pdf.

2: Task Force on Major Operational Disruption in the Financial System (2003) *Do we need new statutory powers?* available at: www.fsc.gov.uk/upload/public/Files/1/tf_report_whole_report.pdf.

Table 3: Summary assessment of key UK payment systems against the Core Principles

	CHAPS £ & €	CREST £ & €	CREST US$	LCH.Clearnet Ltd PPS[1]	BACS	C&CC
I: Legal basis	Broadly Observed	Observed	Broadly Observed	Observed	Broadly Observed	Partly Observed
II: Understanding financial risks	Observed	Observed	Observed	Broadly Observed	Observed	Observed
III: Management of financial risks	Observed	Observed	Partly Observed	Partly Observed	Not Observed	Not Observed
IV: Prompt final settlement	Observed	Observed	Partly Observed	Observed	Observed	Observed
V: Settlement in multilateral netting systems	N/A	N/A	N/A	N/A	Not Observed	Not Observed
VI: Settlement asset	Observed	Observed	Partly Observed	Broadly Observed	Observed	Observed
VII: Security and operational reliability	Observed	Observed	Observed	Observed	Broadly Observed	Broadly Observed
VIII: Efficiency	Observed	Observed	Observed	Observed	Under Review	Under Review
IX: Access criteria	Broadly Observed	Partly Observed	Partly Observed	Broadly Observed	Partly Observed	Broadly Observed
X: Governance	Broadly Observed	Partly Observed	Partly Observed	Observed	Broadly Observed	Broadly Observed

Key: Not Observed | Partly Observed | Broadly Observed | Observed | N/A | Under Review

1: The LCH.Clearnet Ltd Protected Payments System (PPS) enables settlement of obligations between LCH.Clearnet Ltd and its members in twelve currencies. One exception to the assessment shown in Table 3 is that the Bank assesses the UK PPS's arrangements for US dollar settlement partly to observe Core Principle VI.

Chapter 3: Assessing payment systems against the Core Principles

This Chapter discusses the key elements of the Bank's assessment against the Core Principles of the main UK payment systems – in particular, CHAPS, CREST, LCH.Clearnet Ltd, BACS and the Cheque and Credit Clearings. The Annexes provide the detailed assessments on which this Chapter is based, while Table 3 provides a summary picture of that assessment.

Overall, the message from Table 3 is relatively encouraging. A number of the systems come close to satisfying fully the minimum standards defined by the Core Principles. Indeed, a number of systems compare favourably with international best practice. Nonetheless, there are several areas where further improvements might be warranted and work has been under way – for example, as indicated by the red and amber zones in Table 3.

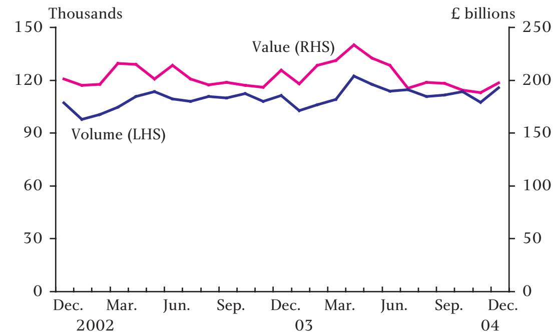
This chapter also considers risks in the two international infrastructures for which the Bank is part of a co-operative oversight process (CLS and SWIFT), in the LINK ATM network and in the Visa and MasterCard debit and credit card systems. The Bank has not conducted full Core Principles assessments for these systems, but has used them as the basis for assessing risks.

3.1 CHAPS

The Bank's assessment of CHAPS against the Core Principles (the summary of which can be found in Annex A) describes how it fully observes six of the nine relevant Core Principles, with the remaining three broadly observed. The system's sound design and operational resilience were also reflected in the IMF's Financial System Stability Assessment of the United Kingdom, which judged CHAPS to be of "a very high standard internationally".

The Bank attaches particular priority to mitigation of risk in CHAPS on account of the high value of payments (around £200 billion per day in CHAPS Sterling), as well as the significant volumes (over 100,000 payments per day in CHAPS Sterling) it processes.[1]

Chart 2:
Average daily volume and value of payments processed in CHAPS Sterling



Source: Bank of England.

Notwithstanding the high standard of CHAPS operational performance, there are a few areas where observance of the Core Principles could be reinforced. Also, while the CHAPS design minimises settlement risk between system participants – hence the system's high degree of observance of related Core Principles – the Bank has sought to gain a better understanding of how the tiered structure of participation in CHAPS could result in settlement or credit exposures outside the system.

Settlement risk (Core Principles VI and IX)

As a Real-Time Gross Settlement (RTGS) system which settles in central bank money, the credit risk associated with deferred net settlement does not arise between CHAPS members in normal operations. However, the 'tiered' structure of payment arrangements in CHAPS does raise settlement risk issues. Relatively few UK banks are direct settlement members of CHAPS,[2] with most other banks in the United Kingdom handling their

1: CHAPS Euro processes around 5,000 domestic euro transactions per day, with a sterling value of £18 billion, and 20,000 TARGET transactions per day, with a sterling value of £136 billion.

2: Excluding the Bank of England, there were twelve members of CHAPS Sterling and 18 members of CHAPS Euro on 31 December 2004.

payments indirectly through one of these settlement members. A significant volume and value of payment transactions take place across the books of CHAPS members rather than across accounts at the Bank of England.

This degree of tiering in the large-value payment system is high by comparison with some other developed countries (Table 4). It may not be optimal for all banks to be members of a payment system. But any degree of tiering does have a number of potentially negative implications for risk. For example, the finality of payments made or received across the books of CHAPS member banks on behalf of indirect participants is not protected in the same way as payments across CHAPS, which is designated as a system under the regulations implementing the EU *Settlement Finality Directive* in the United Kingdom. Payments to and from indirect participants may also result in settlement banks offering unsecured credit to indirect participants. These exposures can be large, especially in stressed market conditions. An additional risk in a tiered payment system is the concentration of activity on a limited number of key settlement banks.

One development that may encourage additional banks to consider becoming settlement members of CHAPS Sterling is the reform of the Bank's operations in the sterling money markets announced in summer 2004.[3] The reforms are designed primarily to stabilise overnight sterling market interest rates. UK banks and building societies will be given access to reserve accounts at the Bank remunerated at the Bank's repo rate. Settlement members will be able to use these reserves to support intraday payments in CHAPS Sterling, which may attract more banks to become direct settlement members.

The Bank has also looked at potential barriers to institutions becoming members of CHAPS. For example, the fixed costs to joining CHAPS (including a £100,000 joining fee) and fixed annual fees are high relative to other systems (if not in absolute terms) and fall disproportionately on smaller-volume members. There may be some scope for reconfiguring these costs to help attract new members. The CHAPS Board is reviewing the fixed joining fee.

Operational risk (Core Principle VII)

CHAPS has occasionally suffered from incidents which have prevented individual members, or the system as a whole, from processing payments for periods during a day. As well as having direct implications for CHAPS, such outages can also affect other systems, such as CLS. For this reason, the IMF Assessment emphasised the importance of CHAPSCo continuing to ensure that due attention is paid to the high availability of the CHAPS system (see Box 3).

Since the IMF Assessment was completed, the operational reliability record of the CHAPS systems has improved. For example, over the past year there have been relatively few operational outages to CHAPS caused by either members or central systems. The central processing infrastructure operated by the Bank experienced less than two hours downtime during 2004.

CHAPSCo rigorously monitors members' performance as part of its normal day-to-day business. The CHAPS *Procedural Documentation* (the "*Procedures*") sets out various guidelines for the service levels expected of members. For example, under the *Procedures*, members are expected to manage their payments so as to minimise requests for 'cut-off extensions' (a member might request a cut-off extension if it has been unable to process all its payments by the deadlines of the daily CHAPS Sterling timetable). Too many requests for extensions (or other breaches of the Service Level Codes specified by CHAPSCo) can result in a member being asked to appear before a so-called 'Star Chamber' where they will be asked to set out plans to restore service to acceptable levels.[4]

3: www.bankofengland.co.uk/markets/money/smmreform040507.pdf.

4: At the so-called 'Star Chamber', a member's CHAPS Board director will be required to explain the steps being taken to resolve issues and to return performance to agreed service levels and guidelines. Those present at a hearing include the CHAPS Company Chairman, CHAPS Company Manager and Manager CHAPS Operations and Project Support.

Table 4: Number of direct participants in large-value payment systems

Country	System	No. of direct participants[1]	No. of financial institutions[2]
Belgium	ELLIPS	16	562
Canada	LVTS	14	49
France	TBF PNS	156 21	1,069
Germany	RTGSplus	93	2,463
Italy	BIREL	204	1,300
Japan	BOJ-NET	371	2,560
Netherlands	TOP	106	464
Sweden	K-RIX E-RIX	19 13	906
Switzerland	SIC	307	375
United Kingdom	CHAPS Sterling CHAPS Euro	13 19	386
United States	Fedwire	7,736[3]	8,131[4]

Sources: CPSS (2004) *Statistics on payment and settlement systems in selected countries* and OECD (2002) *Bank Profitability*.

1: Data for end-2003.

2: Financial institutions not including insurance companies. The definitions vary across countries. Data for 2001 except the Netherlands (2000).

3: Number of depository institutions that used the 'Fedwire Funds Service' in 2003.

4: Due to definitional differences, the number of financial institutions shown may not precisely define the scope of potential participants in each payment system.

At present, therefore, CHAPSCo and its members rely on peer pressure to enforce discipline. The IMF highlighted the need to monitor the level of extensions and consider more stringent disciplinary processes if problems persisted. The number and length of extensions to the CHAPS Sterling timetable increased during 2003 compared with a year before. There were fewer extensions in 2004, though they were still more frequent than in 2002. If standards were to slip, it would be worthwhile CHAPS investigating financial penalties on members, as are used effectively by some other systems.

External audit (Core Principles VII and X)

In order to give management and stakeholders assurance that appropriate operational and security controls are in place and working properly, many market infrastructure providers commission external auditors to carry out so-called 'SAS 70' reports or equivalent assessments.[5] SAS 70 reports cover three areas:

- the design and operation of an institution's control environment and procedures;
- an assessment of whether the policies and procedures described, if properly applied, would be adequate to deliver the control objectives set by management; and

5: 'SAS 70' is an abbreviation for American Institute of Certified Public Accountants (AICPA) *Statement on Auditing Standards Number 70*.

- an assessment of whether such policies and procedures were in operation during the period under review.

Both CHAPSCo itself, and the Bank of England as a supplier of RTGS infrastructure services to CHAPSCo, have commissioned external auditors to carry out SAS 70 reports on their own arrangements. The report on the Bank's provision of RTGS services found that controls and procedures were operating to provide assurance that the Bank's control objectives were achieved, but offered comments on a small number of areas where improvements could be made. Work to implement these improvements has begun. At the same time, the operational area of the Bank has also sought to make the control procedures, policies and objectives more demanding, taking account of advice from CHAPSCo and the external auditor, as well as the Bank's oversight and internal audit functions.

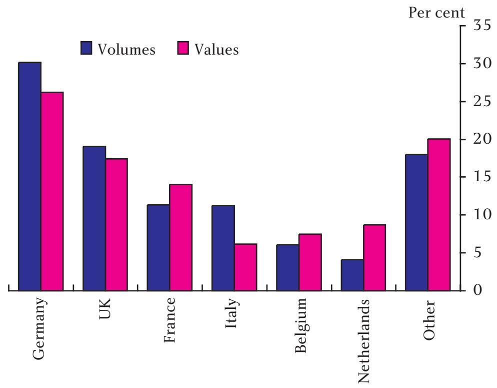
Business continuity planning (Core Principle VII)

CHAPS has well-established and effective arrangements in place to ensure that the functioning of its central infrastructure does not have any single points of failure. However, CHAPSCo and the Bank have looked at ways to strengthen its resilience further. They have also sought to analyse the extent of the system's vulnerability to incidents that could affect some settlement members, even if the central system continued to function.

3.2 TARGET and CHAPS Euro

The Bank takes part in the collective oversight of the TARGET system, which includes a UK component, CHAPS Euro. CHAPS Euro is the second largest component of TARGET by both value and number of cross-border payments (Chart 3). Recently, much of the focus of TARGET oversight work has been on establishing and applying a consistent oversight framework across the 16 different TARGET components. As part of this work, the Bank has carried out an assessment of CHAPS Euro against the Core Principles[6], conducted a security risk assessment of CHAPS Euro and worked with other central banks on the elaboration of oversight principles for TARGET.

Chart 3:
Share of 2003 cross-border TARGET payments by TARGET component[(a)]



Source: European Central Bank.
(a) Value and volume of outward cross-border TARGET payments.

Operational risk (Core Principle VII)

In 2003, an assessment of the risk profile of the 16 TARGET components was carried out by operational staff from the relevant central banks as part of the introduction of a new *TARGET Risk Management Framework*. As part of this exercise, the compliance of TARGET components with 117 benchmark security controls defined in the *TARGET Security Requirements and Controls* (TSRC) document was assessed. The assessment of the UK component found that it was almost fully compliant with the TSRC. The exercise identified a few areas of non-compliance in non-critical areas, which were subsequently accepted by management.

3.3 CREST

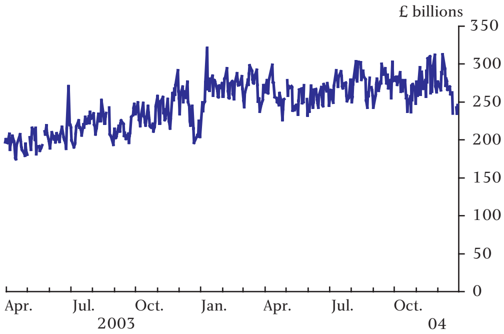
The Bank assesses the embedded payment arrangements supporting CREST settlement to observe fully seven of the nine relevant Core Principles. The US dollar payment arrangements – and, most importantly, the interbank settlement of those US dollar payments – do, however, fall short of compliance with the Core Principles in a number of respects. Those weaknesses, and work

6: The assessment was conducted in mid-2003. In order to achieve a high degree of consistency and comparability in the national assessments, a common methodology was developed and used by the national central banks when carrying out their assessments. A summary of the exercise and the assessments was published by the ECB in May 2004 – see www.ecb.int/pub/pdf/other/assessmenteurolargevaluepayments2004en.pdf. This *Report* updates the Bank's assessment of CHAPS Euro at that time.

that has begun to address them, are discussed further below, while the full assessment against the Core Principles can be found at Annex B.

Overall, however, CREST provides a robust and resilient service. Like CHAPS, CREST processes very high values (regularly in excess of £250 billion per day) and large numbers of transactions (over 250,000 settlement instructions per day).

Chart 4:
Sterling DvP transactions in CREST



Source: CRESTCo.

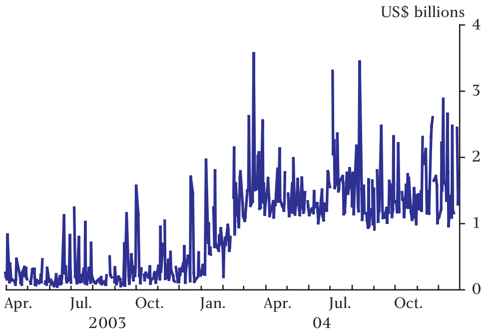
As part of the IMF Financial System Stability Assessment of the United Kingdom, CREST was assessed against the CPSS-IOSCO Recommendations, which encompass a wider range of securities settlement system activities than a Core Principles assessment of the embedded payment system. The IMF Assessment found that in the small number of instances where CREST failed fully to observe particular Recommendations, this was largely outside the scope and control of CRESTCo.

Settlement risk (Core Principles III, IV, V and VI)

Following the integration of money market instruments (MMIs) on to the CREST settlement platform in 2003 Q4, CREST has provided a Delivery versus Payment (DvP) settlement service for the full range of UK securities settled in sterling and euro. Thus, settlement in sterling or euro of any securities in CREST occurs without any principal risk for the participants, for whom transfers of stock and cash are simultaneous and final on a transaction-by-transaction basis. This integration of MMI settlement meant completion of the final outstanding recommendation of the 1998 *Securities Settlement Priorities Review*[7] and the removal of a major source of financial risk in the United Kingdom's securities settlement infrastructure identified by the IMF Assessment (Box 3).

CREST also provides for transactions to be settled in US dollars. Since the integration of MMI settlement into CREST, there has been a significant rise in the value of US dollar settlement, albeit from a low base (Chart 5). The settlement arrangements for US dollars are less robust than those for sterling and euro and give rise to settlement risk for the US dollar settlement banks (Annex B). The current model allows members' US dollar payment obligations to be replaced by obligations between their settlement banks. These are settled on an end-of-day, bilateral net basis across accounts in the United States. A settlement bank is therefore briefly exposed to the risk that one or more of the banks from which they are due to receive US dollars will fail to deliver those funds.

Chart 5:
US dollar transactions in CREST



Source: CRESTCo.

A multilateral net settlement arrangement, if legally robust, would reduce the size of collective exposures between banks. However, multilateral net settlement mechanisms need to be supported by 'failure to settle' procedures in the event of a net payer bank failing to meet its obligations. The possibility of developing a formalised and suitably robust method of multilateral net settlement is being investigated by CRESTCo and the settlement banks, with the support of the Bank.

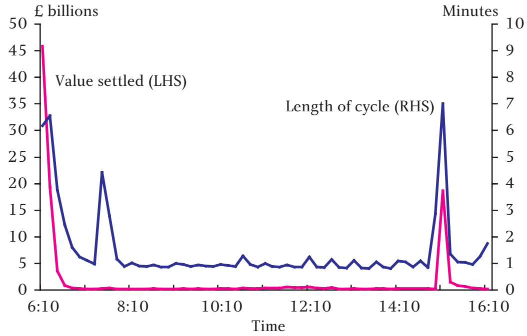
7: More details can be found in the December 2003 *Financial Stability Review*, pages 88–89.

Like the CHAPS system, the embedded payment arrangements supporting CREST settlement are tiered. Currently, there are just 15 CREST settlement banks providing cash settlement (in one, two or all three of the CREST settlement currencies) to a system membership of over 2,000 banks and broker dealers, as well as around 39,000 private clients. As with CHAPS, such tiering can potentially result in significant exposures arising between settlement banks and the members they represent. This was identified as a potential area of risk in the IMF Assessment. The Bank has therefore been working with CREST and its members to improve information on, and understanding of, the risks that this tiering might produce – for example, the extent to which these exposures are collateralised. Reform of the Bank's operations in the sterling money markets may encourage an increase in the number of CREST settlement banks.

CREST central bank money settlement currently takes place on a very high frequency batch basis. This involves consecutive gross settlements at the end of each of over 600 CREST transaction processing cycles through the day. Currently, there are three times in the day when these transaction processing cycles are of relatively longer duration. These occur when there is either very high volume processing (at the start of the day) or complex transaction processing takes place (morning and mid-afternoon). In either case, a mid-cycle processing malfunction could be difficult to resolve and could be disruptive to the financial system.

Twice a day the instances of longer cycle duration coincide (or are directly associated) with very high settlement values being generated (Chart 6). This coincidence of high settlement values and longer duration cycles increases the potential systemic disruption associated with a mid-cycle processing malfunction. Cycle duration has already been substantially reduced following an upgrade to the CREST processing platform in early 2004. The initial replication of CREST's cycles-based processing on Euroclear's new settlement platform, scheduled for mid-2006, provides a further opportunity to reduce cycle duration, especially during periods when large values are being settled.

Chart 6:
Average length and value of individual CREST settlement cycles in December 2004[(a)]



Source: Bank calculations.

(a) Average of interbank settlement flows, measured in ten-minute intervals through the day.

CREST-Euroclear merger (Core Principles VI, VII, VIII and X)

In September 2002, CRESTCo became a wholly-owned subsidiary of Euroclear Bank, the international securities depository and, at the time, the operational holding company for the Euroclear Group (which now operates the securities settlement systems in the United Kingdom, Ireland, France and the Netherlands).[8] While the merger has so far had no direct impact on the settlement process in CREST, its longer-term effect will be considerable. A major element of the Euroclear business plan is to integrate all of CREST's settlement functionality (and that of the rest of the group) on to a single application platform. The Bank is working closely with the other affected central banks, with CRESTCo and with Euroclear to ensure that the new and harmonised central bank money settlement arrangements for euro and sterling are at least as robust as the current arrangements that support CREST settlement (see Chapter 4).

Operational risk (Core Principle VII)

Given the pivotal role of CREST settlement in the smooth functioning of UK financial markets, and

8: A new holding company, Euroclear SA/NV, was created on 1 January 2005. CRESTCo, the other two group companies operating national securities settlement systems, and Euroclear Bank have become wholly-owned subsidiaries of the new holding company. Euroclear SA/NV will also develop and own the new technology platform for the group.

in the Bank's open market operations, its operational resilience is of great importance. The Bank, together with the FSA, which regulates CREST as a Recognised Clearing House, monitors CREST's operational performance and its business continuity arrangements closely. As with central bank money settlement arrangements, the operational risk controls, business continuity plans and the ability of regulators to monitor them must be at least as robust following the migration from current arrangements to a single platform. The architecture proposed by Euroclear exceeds minimum standards for business continuity.

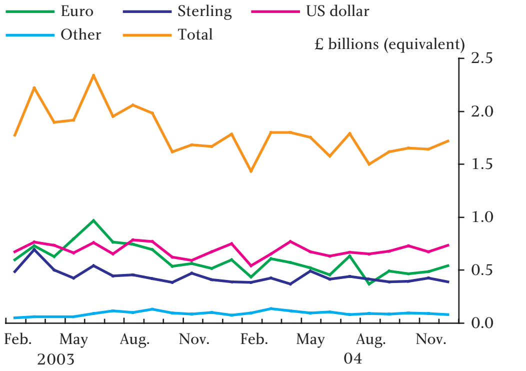
In parallel, the Bank has (with the FSA, Belgian, Dutch, French and Irish authorities) been devising a framework for oversight and regulatory co-ordination to allow each relevant authority to fulfil its responsibilities while reducing the regulatory burden on Euroclear. The practical implementation of these new co-operative oversight arrangements remains, at present, untested. This will be an important area of future work (see Chapter 4).

3.4 LCH.Clearnet Ltd

The Bank's assessment of the Protected Payments System (PPS) of LCH.Clearnet Ltd against the Core Principles indicates that the UK PPS observes fully five of the nine relevant Core Principles. It also highlights, however, some areas where the overall safety of the payment arrangements could be improved – for example, the PPS might benefit from more detailed and public documentation to clarify the responsibilities and risks of the various participants in the embedded payment arrangements. Much of this work is already under way. This section also highlights work to transfer the role of concentration bank to the Bank of England – which should bring the PPS into full observance of Core Principle VI for transfers in sterling and euro. The full assessment can be found at Annex C.

Chart 7 shows the average value of payments made between LCH.Clearnet Ltd and its members through the 14 UK PPS banks. The amounts are small in comparison with those made through most other systems overseen by the Bank. However, as described in Box 1, a disruption of the PPS could potentially cause wide disruption to financial markets.

Chart 7:
Average daily flows over the UK PPS[(a)], by currency



Sources: LCH.Clearnet Ltd and Bank calculations.
(a) LCH.Clearnet Ltd Protected Payments System.

Settlement risk (Core Principle VI)

Transfers within the PPS are protected from unwinding in the event of the insolvency of one of the PPS banks by the provisions of the *Financial Markets and Insolvency (Settlement Finality) Regulations* (1999), which transposed the EU *Settlement Finality Directive* in the United Kingdom. Nonetheless, there remains a small risk to LCH.Clearnet Ltd from holding funds on account with commercial banks. At the centre of the PPS is a 'concentration bank' for each currency. LCH.Clearnet Ltd gathers together all amounts received from members in that currency at the concentration bank before investing any surplus in the money market. The failure of a concentration bank, or deficiencies in its operating systems and procedures, could therefore have a significant impact on the functioning of LCH.Clearnet Ltd.

This risk was noted by the IMF in the Financial System Stability Assessment of the UK financial system, which recommended that the PPS should make greater use of settlement across accounts at the Bank of England. The Bank's operational and oversight teams and LCH.Clearnet Ltd are currently engaged in a project to transfer the role of concentration bank for sterling and euro payments in the PPS to the Bank. If implemented, this would eliminate any risk that LCH.Clearnet Ltd could be adversely affected by the failure of its concentration bank for those currencies. In addition, it is intended that the new arrangements will require an earlier transfer of funds in the PPS, thus reducing the window when LCH.Clearnet Ltd carries a credit and liquidity exposure to the other PPS banks.

While the new arrangements would make the Bank of England the concentration bank for sterling and euro payments, Chart 7 shows that the US dollar element of payment transfers through the PPS is the largest by value. The Bank and LCH.Clearnet Ltd have begun discussions about whether there are alternative arrangements that might reduce credit risk, perhaps using central bank account balances, which are free from such risk.

Operational risk (Core Principle VII)

To a large extent, the operation of the PPS is dependent on external systems such as CHAPS and SWIFT, as well as the internal operations of the PPS banks themselves, including the concentration banks. Furthermore, the PPS exists only as a mechanism to transfer funds between LCH.Clearnet Ltd and its members, and as such is dependent on the proper functioning of the LCH.Clearnet Ltd systems themselves to calculate amounts owing based on current positions and prices. A new, common technical platform is planned as part of the implementation of the merger between LCH and Clearnet. The operational robustness of, and business continuity arrangements for, the new platform will be crucial for the continued resilience of the PPS.

Co-operative oversight (Core Principle X)

The Bank and FSA, together with Belgian, Portuguese, Dutch and French central banks and regulators have agreed a framework for oversight and regulatory co-ordination with respect to LCH.Clearnet Group. They have drawn up an MoU, which is already taking practical effect and is in the process of being formally signed. As with the Euroclear group, the implementation of these new co-operative oversight arrangements will need to be tested in practice to ensure they are robust. As part of this framework, central banks and regulators have been in discussion with LCH.Clearnet Group about the implementation of the merger of the two central counterparties over the next few years.

3.5 CLS

The US Federal Reserve, together with the other central banks (including the Bank of England) participating in the co-operative oversight of CLS, formally assessed the system's compliance with the minimum standards set out in the *Lamfalussy Report*[9] before the system began operation. The central banks have also assessed CLS informally against the full set of Core Principles.[10] One priority for overseers over the past year has been to satisfy themselves that proposed enhancements to CLS's risk management framework and operational procedures are consistent with the Lamfalussy minimum standards and the Core Principles. This is explored further below.

Chart 8 shows that values and number of trades settled in CLS have increased steadily since the system went live in 2002, with the exception of a few dips in line with seasonal declines in foreign exchange market activity. The main factors responsible for the growth over the past year have included existing members' settlement of a larger share of their trades in CLS and an increase in the number of third-party users of the system to over 200 by the end of 2004.

Settlement and liquidity risk (Core Principle III)

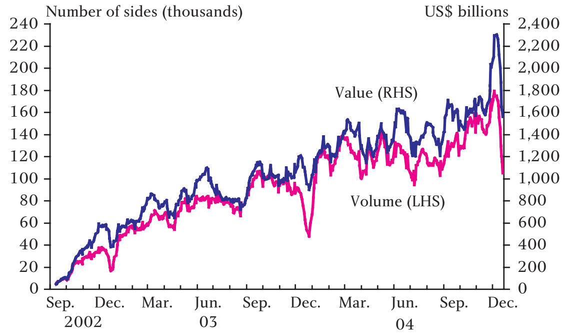
CLS has refined its risk-management framework to accommodate a wider range of currencies in its settlement process and extend its risk reduction benefits for members trading these currencies. In consultation with central banks, CLS has sought to ensure that the changes to its framework for eligible currencies enable this settlement risk reduction to be achieved without an offsetting increase in operational, liquidity, legal, market or credit risks. Using this revised framework, CLS

9: BIS (1990) *Report of the Committee on Interbank Netting Schemes of the Central Banks of the Group of Ten Countries (Lamfalussy Report)*, available at: http://www.bis.org/publ/cpss04.pdf. The Core Principles draw upon the Lamfalussy Standards and extend them to a wider range of payment systems.

10: Following a period of public consultation in 2004, the Federal Reserve Board introduced several changes to its payment system risk policy, including adoption of the Core Principles (see www.federalreserve.gov/boarddocs/press/other/2004/20041126/default.htm). The changes became effective from 3 January 2005.

added the Korean won, Hong Kong dollar, New Zealand dollar and South African rand into its settlement process in 2004, bringing the total number of settled currencies to 15.[11]

Chart 8:
Daily volumes and values settled in CLS (ten-day moving average)[(a)]



Source: CLS Bank International.

(a) The unit of measurement for trade volumes is 'sides'; there are two sides to each transaction. Both sides are counted in the value figures.

Central banks have also continued to monitor the extent to which the CLS Inside/Outside (I/O) swaps mechanism, used by some settlement members to reduce the liquidity pressures generated by their pay-in requirements, reintroduces principal risk outside the system. While the share of I/O swaps as a proportion of the total principal risk eliminated by the system fell sharply in the first few months of CLS's operations, more recently the figure has stabilised at around 6%. Moreover, in absolute terms the average daily value of I/O swaps has risen slightly to around US$80 billion. In the design of CLS's settlement process, there is a trade-off between reducing credit risk and lowering liquidity risk. I/O swaps increase the former but reduce the latter. UK-based settlement members of CLS have told the Bank that at present they consider the extent of the trade-off acceptable. However, the role and impact of I/O swaps will need to be kept under review as the system expands.[12]

Few UK institutions are currently third-party CLS users, implying that many have yet to take advantage of the foreign exchange settlement risk reduction benefits offered by CLS.[13] The Bank understands, however, that the largest UK foreign-exchange trading banks not already CLS settlement members are in the process of becoming third-party users. This suggests that there may be a further modest increase in the share of UK banks' foreign exchange transactions settled through CLS. At the same time, data released by the Bank for International Settlements (BIS) showed that total daily turnover in the foreign exchange market averaged some US$1.9 trillion in April 2004. Taken in conjunction with CLS's settlement figures, this suggests that significant volumes and values of foreign exchange trades – well over half of the market – continue to be settled outside CLS and hence that many institutions continue to face avoidable settlement risk. Issues relating to the contribution made by CLS to reducing foreign exchange settlement risk are discussed in more detail in the December 2004 *Financial Stability Review*.[14]

Operational risk (Core Principle VII)

Management of operational risk is given a high priority by central banks and by CLS itself, not least given the potential cross-border impact of an operational failure affecting any of its settled currencies. Central banks have sought to ensure that the system's design and operation meet an appropriately high standard of availability and resilience of service, both in normal operations and in the event of disruption to normal operations. Central banks have also sought assurances that CLS has processes to mitigate the risk from key dependencies on external parties, including SWIFT, the RTGS systems through which it receives and makes its payments and individual settlement members. For its part, the

11: The other currencies settled in CLS are the US dollar, euro, Japanese yen, sterling, Swiss franc, Australian dollar, Canadian dollar, Danish krone, Norwegian krone, Swedish krona and Singapore dollar.

12: CLS is endeavouring to find ways to reduce the extent to which settlement risk is reintroduced by I/O swaps. This includes investigating the feasibility of introducing additional (later) settlement sessions, in which some of the current out legs of I/O swaps could be settled.

13: Barclays, HSBC, RBS Group and Standard Chartered are settlement members.

14: *Continuous Linked Settlement (CLS) and foreign exchange settlement risk,* Bank of England *Financial Stability Review*, December 2004, pages 86–92, available at: www.bankofengland.co.uk/fsr/fsr17art5.pdf.

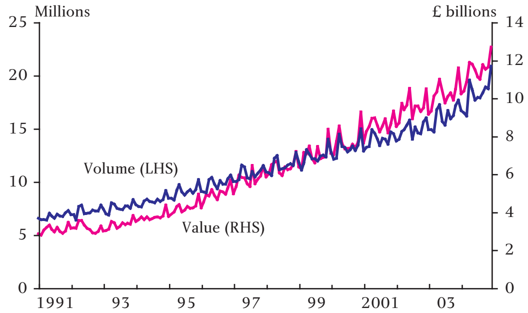
Bank has sought to satisfy itself that CLS complies with standards at least as demanding as those it expects of domestic payment systems of systemic importance.

Service reports provided by CLS to its members and to central banks show that CLS has been operating reliably during the period under review, with the exception of a small number of minor incidents. Where incidents did occur, fixes or measures to prevent repetition and/or mitigate the impact were rapidly introduced. A 'New Service Platform' was installed in May 2004, incorporating updated hardware and operating systems to handle larger volumes on normal and peak days, and aimed at improving the resilience of the technology. Evidence so far indicates that the new platform has succeeded in further improving the system's processing efficiency and operational reliability.

3.6 BACS and the Cheque and Credit Clearings

The United Kingdom's largest retail payment systems by value are BACS and the Cheque and Credit Clearings (C&CC).[15] BACS processes an average of around 18 million electronic payments (Direct Debits, Direct Credits and standing orders) totalling around £11 billion in value each day and the number of payments processed in BACS has risen by over 170% since 1991 (Chart 9).

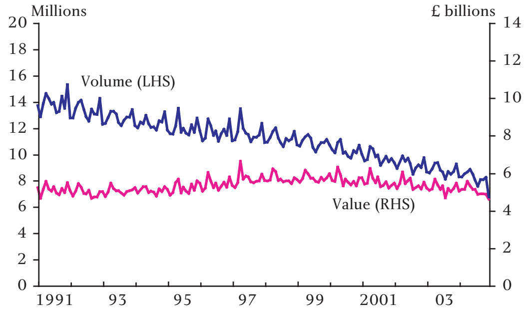
Chart 9:
Average daily volume and value of payments processed in BACS



Sources: APACS and Bank calculations.

The C&CC enable instructions given in paper form (cheques and paper credits) to be exchanged and settled between banks. The two paper clearings process an average of around 8 million payments, with a total value transferred of around £5 billion each day. By contrast with BACS, the number of payments processed has fallen by 40% since 1991, although the *value* of payments processed has remained relatively constant over the same period (Chart 10).

Chart 10:
Average daily volume and value of payments processed in the C&CC



Sources: APACS and Bank calculations.

(a) Volumes include items drawn on other branches of the same bank. Values only include those drawn on other banks.

The Core Principles provide the appropriate benchmark against which to assess BACS and the C&CC. The Bank expects both to show a high degree of compliance with most of the Core Principles, although there are a few instances where it may not be practicable for them fully to observe a particular Core Principle.

The Bank judges BACS to observe six of the Core Principles either fully or broadly, but to fall short on three others – most significantly Core Principles III and V relating to settlement risk.[16] Action is being taken to improve the degree of observance in these areas. There are similar weaknesses in the C&CC. In particular BACS, the C&CC and their members intend to have a new legal agreement – described further below – to mitigate these risks ready for signature by the end of the first quarter of 2005.

15: BACS Payment Schemes Ltd (BPSL) is responsible for the Direct Debit, Direct Credit and standing order payment products. The core processing of these transactions is outsourced to a single third party – Voca (formerly known as BACS Ltd).

16: Pending the completion of further analysis to evaluate the costs and benefits of shortening the time taken to transfer funds between accounts, the Bank has not assessed the compliance of either system with Core Principle VIII on efficiency, but will return to this issue in the coming year (Annexes D and E).

Settlement risk (Core Principles III and V)

BACS and the C&CC are deferred multilateral net settlement systems. This means payments submitted are netted to produce a single obligation to, or claim on, the other members of the system as a group. Providing it is legally robust, this multilateral netting can reduce credit exposures to individual members more effectively than bilateral netting.[17] But a drawback of multilateral netting is the potential uncertainty about who would bear any losses in the event of a default by a member in a net debit position. In the absence of agreed procedures, no member in a net credit position would be able to receive funds from the affected settlement, even if all other net debtors had paid. Neither BACS nor the C&CC currently has procedures for funding any defaulter's position or for sharing potential losses. Both schemes and their members are working to address the resulting risk that one or both might be unable to continue to operate in the event of a default, with consequent disruption to the wider economy.[18]

To satisfy the Core Principles, a multilateral netting system should, at a minimum, be capable of ensuring the timely completion of daily settlements if the participant with the largest net debit position is unable to settle. The *Liquidity Funding and Collateralisation Agreement* – which members are finalising – is designed broadly to satisfy this requirement. Under the current proposal, if a settlement member fails to pay, settlement would be completed by recourse to surviving members for committed 'liquidity funding', in total up to the peak exposure to any member over the previous year. This is currently just over £2 billion in aggregate. This liquidity funding is in part secured by collateral pledged in advance by the defaulter. All members would contribute collateral (according to a measure of the risk they bring to the system) and the total collateral provided would also equal the peak exposure over the previous year.

This structure seeks to ensure that any defaulting member would make at least some contribution towards any losses resulting from its default. On the basis of recent actual positions, a defaulting member's own collateral would have been sufficient to cover completely its obligations on around 60% of occasions. The settlement member banks and the schemes have worked over the past year to agree the details of this arrangement and put them in contractual form. Members aim to produce an Agreement ready for signature by the end of the first quarter of 2005.

This Agreement will mitigate much of the settlement risk currently present in BACS and the C&CC. But potential unsecured exposures between settlement members will continue to be uncapped. One area of future work for the schemes and their members will therefore be to consider approaches to reduce settlement risk further. The Bank has suggested some possible options, which are outlined in Chapter 4 and Box 5.

The Agreement also supports work to establish greater clarity and predictability about how payments already being processed by banks would be treated in the event of insolvency of a settlement bank in the BACS or the C&CC systems. Continuing the processing of payment messages that have entered the system and passed a clear point of interbank irrevocability, as defined in the rules of the system, is likely to minimise disruption to the users of the system and the economy as a whole. Often there will be no practical alternative to continuing processing in this way. At the same time, the systems and their members are looking at ways to ensure they could reliably prevent processing of messages that have not passed this point if the payment involves a failed bank. The Agreement, and associated work, cannot prevent customers of a failed bank from potentially suffering losses in the event of an insolvency. Treating all payment messages in a system according to the same rules can, however, reduce the potential for inconsistent and inequitable outcomes.

17: In June 2003, members implemented *Settlement Agreements* protecting the legal robustness of this multilateral netting. See the December 2003 *Financial Stability Review*, Box 5, pages 98–99 for further details.

18: The Bank also reported on these risks and the steps being taken to address them in its December 2003 *Financial Stability Review*, Box 5, pages 98–99.

Operational risk (Core Principle VII)

Over the past year, the Bank has analysed an increasingly wide set of data on the operational performance of infrastructure providers to BACS and the C&CC, as well as the members of these schemes. A key area of work for BPSL, its members and Voca is the ongoing project to upgrade Voca's systems and networks supporting the clearing of BACS payments – the NewBACS project. This is important in order to ensure that BACS is supported by systems that have adequate capacity reliably to process the larger future volumes that are projected and so that members and their customers can benefit from enhanced system functionality.

The first major stage of the Voca infrastructure renewal programme has been completed with the implementation of the new 'BACSTEL-IP' network. Members are currently in the process of moving their customers to this new network. The target for completing the migration is currently end-2005. Members of BPSL now need to manage (and encourage) the prompt migration of their customers to avoid the risks associated with a high volume of migration close to the target date.

The other major aspect of the infrastructure renewal programme is to replace the existing main processing platform. Among other things, the new platform will introduce functionality that could allow further reductions in settlement risk – for example, through debit cap features, the ability immediately to exclude a failed member and its users and/or by enabling shorter interbank clearing cycles. Because of the importance of Voca's systems to the smooth processing of BACS payments, Voca and BPSL are drawing up plans to ensure that the availability, integrity and reliability of services will be maintained in a variety of scenarios, including any unanticipated delays in the programme. BPSL and its members will need to be able to gain assurance, independent of Voca, that the programme is proceeding as planned. Voca has agreed a series of governance and audit features to assist BPSL and its members maintain oversight of the programme.

BACS membership criteria (Core Principle IX)

The Bank assesses BACS partly to observe Core Principle IX, which deals with fair and open access to the system. One common way of controlling the level of risk within payment systems is to restrict membership to those institutions that meet certain minimum requirements. For example, many systems choose to restrict settlement membership to supervised credit institutions, which are subject to prudential capital and liquidity regulation. This provides some assurance of a member's ability to manage its liquidity in order to meet its settlement obligations in a timely fashion.

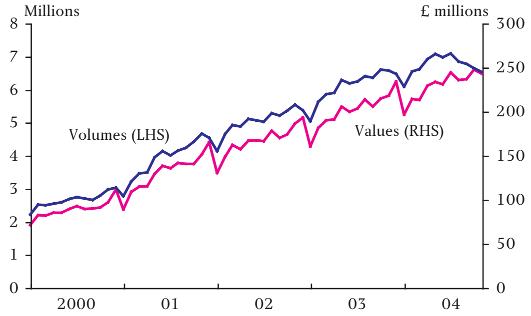
It is important, however, that criteria for membership are the minimum restrictions necessary to manage risk appropriately in the system. Systems should also consider how some of the benefits of membership – for example, access to the wholesale payments tariff and representation on the Board – can be extended to institutions not meeting some of those criteria, provided settlement risk is not reintroduced. Otherwise, the criteria may act as an undue barrier to entry and possibly provide members of the scheme with an unfair advantage over non-members.

Members of BACS have been participating in a project to ensure that membership criteria are objectively justified and permit fair and open access to the system. One current proposal being considered would involve the creation of an additional class of 'clearing membership', which would be open to a wider range of entities than just credit institutions, but which would not bring additional settlement risk to the system. The OFT Payment Systems Task Force is considering the possible benefits of this proposal.

3.7 LINK

LINK is the United Kingdom's largest automated teller machine (ATM) network, which enables its members' customers to withdraw cash from all but a few of the United Kingdom's ATMs, irrespective of the bank at which they hold their account. In the year to November 2004, LINK processed an average of 6.7 million transactions (mainly cash withdrawals and balance enquiries) with an aggregate value of around £230 million each day. Chart 11 shows that the number of transactions processed by LINK rose by over 130% between 2000 and 2003.

Chart 11:
Average daily volume and value of payments processed in LINK[(a)]



Sources: LINK Interchange Network Ltd and Bank calculations.
(a) Data for earlier than 2000 are not available.

Settlement risk (Core Principles I, II, III and V)

LINK is a deferred multilateral net settlement system. Net settlement obligations are typically far smaller than for BACS or the C&CC. Net settlement is carried out over accounts at the Bank of England.

Given the much lower values processed, the Bank has not yet undertaken a full assessment of LINK against the Core Principles. With reference to the benchmark of the Core Principles, the Bank has, however, recommended changes to the way settlement is effected. As one strand of this, the Bank has encouraged the LINK scheme to consider appropriate incentives to ensure prompt pay-ins by members in a net debit position.

Governance (Core Principle X)

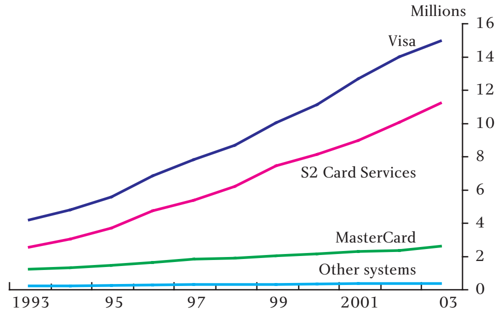
The LINK Interchange Network Ltd (the 'company') is a for-profit, limited company owned by 22 of the 51 members of the LINK ATM-sharing scheme. The company supplies processing infrastructure to the scheme, as well as managing the scheme itself. LINK has, however, sought to increase the degree of separation between scheme and company in the past year. The Bank has encouraged these moves to establish increased clarity regarding their respective roles and responsibilities, which for the scheme involves ensuring that it is provided with high quality processing services.

To increase the effectiveness of its governance, LINK has also appointed independent chairmen to the governing bodies of both scheme and company, and has appointed an Executive Committee of the Board, with fewer members than the Board, to facilitate more effective decision making (all shareholders retain some influence through a process of electing members of the Executive Committee).

3.8 Debit and credit card systems

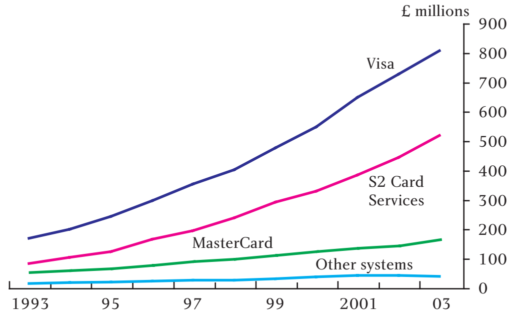
Visa Europe[19], MasterCard Europe and S2 Card Services are the main operators of credit and debit card systems in the United Kingdom. Together the systems process an average of 29 million electronic payments worth around £1.5 billion per working day (Charts 12 and 13).

Chart 12:
Average daily volume of payments through the debit and credit card systems



Sources: APACS and Bank calculations.

Chart 13:
Average daily value of payments through the debit and credit card systems



Sources: APACS and Bank calculations.

19: Visa International's EU region was incorporated as a separate organisation – Visa Europe – in July 2004.

The combined value and volume of payments processed by the systems has risen by an average of 14% and 17% per year since 1993.

As both Visa and MasterCard are international schemes, the Bank has explored how it can best co-operate with other central banks in the oversight of these schemes. While the Bank has not conducted a full assessment of either scheme against the Core Principles, it has liaised with both to establish that their settlement arrangements for sterling transactions and business continuity arrangements are consistent with the standards set out in Core Principles V and VII.

Settlement risk (Core Principle V)

The Bank has worked with MasterCard Europe and S2 Card Services, the UK management company for the Maestro (formerly Switch) and Solo debit card schemes, to assess the robustness of new interbank settlement arrangements for debit card transactions. The new settlement arrangements follow the migration of UK Maestro and Solo transaction processing on to MasterCard Europe platforms. Interbank settlement is due to change in August 2005 from bilateral net payments through CHAPS to multilateral net settlement under MasterCard Europe arrangements. MasterCard Europe's description of the arrangements satisfied the Bank that there were sufficient safeguards to ensure completion of settlement if a member fails to pay-in. In designing their default arrangements, MasterCard took into consideration the benchmark suggested by Core Principle V. S2 Card Services reduced the settlement cycle for UK domestic transactions from T+2 to T+1 in May 2004.

The Bank has also sought to assess the robustness of Visa Europe's interbank settlement arrangements. Visa Europe satisfied the Bank that they too have failure to settle arrangements which allow the timely completion of settlement if the participant with the largest net debit is unable to settle, as recommended by the Core Principles.

Business continuity (Core Principle VII)

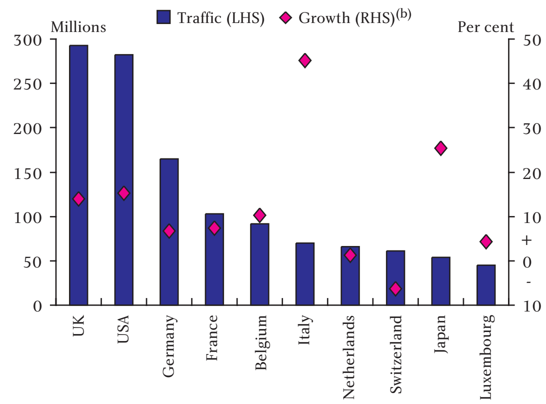
Over the past year, the Bank has sought to learn more about business continuity arrangements at both MasterCard Europe and Visa Europe. It has discussed with them current arrangements for both services and staff. Both systems have invested considerable resources in ensuring there are no single points of failure.

3.9 SWIFT

SWIFT is not a payment or settlement system. It provides secure messaging services to financial institutions and market infrastructures including CHAPS, TARGET, CREST and CLS.

SWIFT has over 7,500 users in over 200 countries. Its traffic has grown considerably in recent years, with an 11% increase in the first nine months of 2004 compared with the same period the previous year. The United Kingdom accounts for 17% of all SWIFT messages sent, more than any other country (Chart 14). Many UK institutions, and the two largest infrastructures by value-settled (CHAPS and CREST), use SWIFT messaging. For these reasons, the availability and integrity of SWIFT's services is of systemic importance to the United Kingdom.

Chart 14:
Traffic sent in SWIFT by location of sending entity: 2004 Q1 to 2004 Q3[(a)]



Source: SWIFT.

(a) Traffic refers to chargeable FIN (SWIFT's core 'store-and-forward' service) messages.

(b) Number of messages in 2004 Q1 to 2004 Q3 compared with the same period in 2003.

The Bank participates with other central banks in the co-operative oversight of SWIFT, with the lead role played by the National Bank of Belgium (SWIFT's headquarters are in Belgium). The objective of overseers is to seek satisfaction that SWIFT is sufficiently resilient and reliable to ensure that interruptions to its operations do not threaten the smooth functioning of the international financial system. Over the past year, overseers, in co-operation with SWIFT, have sought to establish a reinforced structure for this co-operative oversight with wider and more timely access to information. Because SWIFT supports payments and other market infrastructure providers, management of operational risk (Core Principle VII), and associated governance structures (Core Principle X), have both been a major focus of the Bank's oversight activities. The Core Principles are not, however, designed to be directly applicable to a messaging provider such as SWIFT. In the Bank's view, there would be merit in collective work by overseers to define standards more specific to the service SWIFT provides.

Business continuity and resilience (Core Principle VII)

SWIFT has a strong record on availability, integrity and security. Central banks have worked with SWIFT further to enhance its already wide-ranging contingency plans. SWIFT has established a new crisis co-ordination and communication group to ensure adequate information flows and facilitate decision making if severe operational problems were to affect SWIFT. Further testing and enhanced communication of crisis plans should allow SWIFT's high level of resilience to be matched by an awareness and understanding by market participants of the impact of its crisis plans should they need to be invoked – for example, the plan to deal with a loss, for a few hours, of processing capability.

Governance (Core Principle X)

SWIFT is a not-for-profit co-operative, owned and governed by its members. This governance structure allows the interests of the shareholder financial institutions SWIFT serves to be pursued.[20] The SWIFT Board and management, in liaison with overseeing central banks, have worked over the past year to match its audit processes with current best practice. SWIFT has, for example, introduced a number of changes further to improve the effectiveness and independence of its audit function.

The foundation for effective and independent audit is the effectiveness and independence of SWIFT's overall corporate governance, including its Board of directors. The Supervisory Board of 25 directors – currently composed of representatives from 19 different countries – is large in comparison with other corporations, including infrastructure providers. This is one way of having wide geographical representation but, in the Bank's view, presents a challenge in terms of effectiveness and ensuring control over, and accountability of, the executive. Recent reforms to the Board include increasing the length of terms of office for directors from one year to three. SWIFT has also specified guidelines for the levels of experience and seniority of directors.

Core Principle X states that effective governance provides incentives for management to pursue objectives in the interest of the system, its participants and the public more generally. In the Bank's view, SWIFT's forward-looking strategy for corporate governance will need to ensure accountability to the full range of its stakeholders, including those outside its direct user community. For example, the election of independent directors drawn from outside SWIFT's existing member community may help further strengthen governance (see Chapter 4). There may also be scope for greater input to the governance process from market infrastructures which account for a growing share of SWIFT traffic. SWIFT's ongoing dialogue with the co-operating central banks is another example of how broader market and public interests can be incorporated into SWIFT's decision-making and governance process.

20: SWIFT's governance arrangements are set out clearly in the publicly available *Corporate Rules*. Non-executive directors are proposed by national member communities and elected by shareholders. The directors appoint the CEO, who together with other members of the staff, form the 'executive steering group'. The Board receives strategic and policy advice from several Committees, some of which have non-directors drawn from the user community to provide specialist expertise and broader community representation. A few executives attend Board committee meetings and meetings of the full Board but have no voting rights.

Box 3: The International Monetary Fund (IMF)/World Bank Financial System Stability Assessment

As part of the joint IMF/World Bank Financial Sector Assessment Program (FSAP), missions visited the United Kingdom over the period February to July 2002. The main objectives of the FSAP relevant to this *Report* were to assess: CHAPS against the *Core Principles for Systemically Important Payment Systems*; CREST against the *Recommendations for Securities Settlement Systems*; and the transparency of payment systems oversight and other financial stability functions of the Bank. The main findings were published by the IMF in March 2003.[1]

The Bank's June 2003 *Financial Stability Review* included a summary of these findings, which concluded that overall the United Kingdom benefits from a strong financial stability policy framework, but that some technical improvements were required to strengthen the framework further. In July 2003 the IMF published its detailed assessments. Table 5 contains a summary of the key recommendations from those assessments regarding CHAPS, CREST and transparency.[2]

Table 5: Summary of the key IMF recommendations and subsequent action taken

IMF assessment and recommendation	Action
A. IMF assessment of CHAPS against the *Core Principles for Systemically Important Payment Systems*	
Security and operational reliability IMF assessment: *Observed*	
IMF recommendation: "Despite the potentially very high value turnover processed in RTGS bypass… no centralised financial risk management rules currently apply and there is no requirement (or recommendation) that members apply risk management rules of their own."	Progress has been made on this recommendation, as discussed in Annex A.
"…while overall a very well functioning and robust system, it has nevertheless suffered from a few longer outages during the last year…. due attention should be paid to the assurance of a high availability of the system."	The CHAPS section in Chapter 3 discusses this. Recent performance has satisfied this recommendation.
"…cut-off extensions…should be monitored closely with a view to implementing more stringent criteria to enforce discipline if problems persist."	Although progress has been made on monitoring cut-off extensions, the evidence has been mixed and the need for more stringent criteria is inconclusive. This is discussed in the CHAPS section of Chapter 3.
Efficiency IMF assessment: *Observed*	
IMF recommendation: "Transaction fees are set at the same (relatively low) level for sterling- and euro-denominated transactions, although the two RTGS services have different memberships and the payments volumes in the CHAPS sterling service are much larger than those in the euro service. This raises the question of whether the current tariff would enable the euro service to recover costs fully, were some facilities not shared with the sterling service."	RTGS transaction fees for sterling- and euro-denominated transactions continue to be set at the same level. The CHAPS Euro tariff is set to recover the marginal cost of providing the CHAPS Euro system.

1: IMF (2003) *United Kingdom: Financial System Stability Assessment*, available at: www.imf.org/external/pubs/ft/scr/2003/cr0346.pdf.

2: The IMF also conducted a full assessment of the Central Moneymarkets Office (CMO); ten recommendations were made, most of which were unique to the operation of that system. CMO was closed in October 2003 and the settlement of money market instruments transferred to CREST. The ten recommendations for CMO can, therefore, be said to be closed.

Access criteria
IMF assessment: *Observed*

IMF recommendation: "…although the access criteria as such were objective, all information relevant for the membership criteria was not publicly available and the application for membership had to be made to and approved by a body (APACS) which had no legal relationship with the body directly responsible for the system concerned, ie CHAPSCo. Furthermore, membership in the system was linked to membership in another organisation (APACS), committing the applicant to the payment of not insignificant fees."

Since September 2002, applicants must apply to CHAPS, rather than APACS, to become a member of the scheme and membership of APACS is no longer a prerequisite for membership of CHAPS. Furthermore, CHAPS membership and access criteria are defined in the *CHAPS Rules* and are available on the CHAPS website. The issues raised by the IMF have therefore been addressed.

Governance
IMF assessment: *Observed*

IMF recommendation: "…while the system's governance arrangements are effective and accountable, they are not transparent to non-members. Although CHAPS Clearing Company is the organisation responsible for NewCHAPS, it does not itself make public any report on its own or the system activity (payments statistics are published by APACS). Improvements could usefully be considered in this regard."

Following the 2002 APACS governance changes, progress has been made on this recommendation. CHAPS has greater freedom to publicise its activities separately from those of APACS. However, for the time being, CHAPS has chosen to continue publishing its review of activities as part of the *APACS Annual Review*. The CHAPS website is part of the APACS website.

Central bank – disclosure of objectives, role and major policies
IMF assessment: *Observed*

IMF recommendation: "It would be very helpful for… a regular (annual) account of progress here, with some further elaboration of oversight issues and processes from time to time."

This recommendation is being implemented by the publication of this *Report* and so can be considered to be satisfied.

Oversight of non-central-bank systems
IMF assessment: *Observed*

IMF recommendation: "…it would be desirable to lay out more fully and formally in statute the Bank's critical payments and settlement systems oversight responsibility, arising from its central banking functions which inherently underpin monetary policy and financial system stability."

Chapter 1 of this *Report* briefly discusses this issue. There has been no change since the IMF FSAP.

B. IMF assessment of CREST against the *Recommendations for Securities Settlement Systems*

Central counterparties
IMF assessment: *Broadly observed*

IMF recommendation: "Given the importance of LCH for the UK and the international financial market, high priority should be given to replacing the payments scheme with one based on settlement across the books of the BoE (sic), for settlement in sterling and euro."

Work on the payments scheme is discussed in the LCH.Clearnet Ltd section in Chapter 3 of this *Report*. A project is in place to transfer the role of concentration bank for sterling and euro to the Bank of England.

"In addition, the placement of funds in the money market should be converted from the current unsecured basis to a collateralised basis, in order to limit unnecessary credit risk exposure of LCH."

LCH.Clearnet Ltd now secures all but a small proportion of its cash resources. The Bank and FSA have agreed that the new policy and practice on secured lending satisfies their concerns.

"It is important that UK authorities give a very high priority to ensuring that the legal uncertainties are rectified, especially with respect to the default fund."

The Bank is working with HM Treasury, the FSA and LCH.Clearnet Ltd on draft regulations to address these legal issues.

Central securities depositories
IMF assessment: *Broadly observed*

IMF recommendation: "Most actively traded securities are dematerialised. However, MMIs are not. There are plans to introduce that in 2003 (legal amendments are necessary and are in hand) after which observance with this recommendation will be achieved."

The integration of dematerialised equivalents of money market instruments into CREST was discussed in the Bank's December 2003 *Financial Stability Review*. This recommendation is now satisfied.

Delivery versus Payment IMF assessment: *Observed*	
IMF recommendation: "Even if USD [US dollar] transactions presently are small, it should be noted that there is an interbank credit risk stemming from the securities settlement mechanism, which means that principal risk is not fully eliminated."	The US dollar payment arrangements are discussed in the CREST section of Chapter 3. Work is in progress to address this recommendation.
Settlement assets IMF assessment: *Observed*	
IMF recommendation: "The authorities should seek more specific information from CREST or its members about current payment finality arrangements between members and their banks….The high concentration of activities in two settlement banks should be noted by banking supervisors."	Transfers between the cash accounts that members have with their settlement banks within CREST are final and irrevocable from the time at which they are made, and are protected by the provisions of the UK Settlement Finality Regulations. Chapter 4 of this *Report* discusses the issue of concentration and tiering in payment arrangements. Further work is planned by the Bank.
Regulation and oversight IMF assessment: *Broadly observed*	
IMF recommendation: "There is currently no framework for cooperation with relevant authorities outside the UK, which is a part of this recommendation. Such a framework should be established."	The oversight and regulation of systems operating across borders is discussed in Chapter 4. It has become a key concern for the Bank, for example following the merger between Euroclear and CREST in September 2002 (as well as between LCH and Clearnet in December 2003). Progress has been made in developing the necessary co-operative framework of MoUs with the other relevant authorities.

C. IMF assessment of payment systems oversight and other financial stability functions of the Bank of England against the IMF *Code on Good Practices in Transparency of Monetary and Financial Policies*

The broad objectives and institutional framework of financial agencies should be clearly defined, preferably in relevant legislation or regulation IMF assessment: *Observed*	
IMF recommendation: "…it would be desirable to lay out, more fully and formally in statute the Bank's financial stability and payments and settlement systems oversight responsibility, when an appropriate opportunity arises."	Chapter 1 includes a brief discussion of this issue. No progress has been made on this issue since the IMF FSAP.
The role of oversight agencies with regard to payment systems should be publicly disclosed IMF assessment: *Observed*	
IMF recommendation: "At the time of the assessment mission, the Bank had not described its interest with respect to securities settlement systems and clearing houses (including central counterparties) as clearly as it might have…some further elaboration on this point would be useful in future."	This recommendation is being taken forward by the publication of this *Report*. The specific issue of oversight of embedded payment arrangements is discussed in Box 2. This recommendation has now been satisfied.
The agencies overseeing the payments system should promote the timely public disclosure of general policy principles (including risk management policies) that affect the robustness of systemically important payment systems IMF assessment: *Observed*	
IMF recommendation: "It would be very helpful for…a regular (annual) account of progress here, with some further elaboration of oversight issues and processes from time to time."	This recommendation is being taken forward by the publication of this *Report* and so has now been satisfied.

Where financial agencies have oversight responsibilities for self-regulatory organisations (eg payment systems), the relationship between them should be publicly disclosed
IMF assessment: *Observed*

IMF recommendation: "The Bank's objectives with regard to payment systems oversight have been communication clearly to the public, and the June 2002 FSR [*Financial Stability Review*] box… reiterated its operational role in UK payment systems. Future such boxes or similar vehicles might usefully elaborate briefly on the relationship between the Bank's operational and oversight roles in payments systems."

The relationship between the Bank's operational and oversight roles is discussed in Chapter 2 of this *Report*. This recommendation has now been satisfied.

The majority of the recommendations in the IMF assessment have been addressed. Work is in progress on almost all of those remaining. These include a consideration of the statutory underpinnings of the Bank's oversight responsibilities.

The Bank will report progress on those IMF recommendations that have not been satisfied in subsequent *Oversight Reports*.

Box 4: Business continuity – responding to the recommendations of the Task Force on Major Operational Disruption in the Financial System

The Task Force on Major Operational Disruption in the Financial System reported in December 2003.[1] This Task Force – chaired by Sir Andrew Large, the Bank of England's Deputy Governor for Financial Stability, and bringing together private and public sector representatives – made a number of recommendations to improve the UK financial sector's preparedness to respond to operational disruption, for example as a result of terrorist attack.

Recommendation 3 was that "market infrastructures should ensure that they have specific rather than general powers to deal with major operational disruption, and should also ensure that the mechanism for invoking these powers is flexible enough to be operated successfully in a crisis." Systemically important payment systems, Recognised Clearing Houses (RCHs) and exchanges were asked to review their rules and procedures. The Bank of England was asked to monitor the reviews by payment systems, and the FSA to monitor those by the clearing houses and exchanges. The Bank consequently asked a number of the payment systems it oversees to consider Recommendation 3 and advise on any relevant changes to their rules and procedures.

The main UK clearing companies (CHAPSCo, BPSL and the Cheque and Credit Clearing Company, C&CCC) each reviewed whether their decision-making processes were fit for crisis situations. CHAPSCo did not consider any enhancements to be necessary. BACS Payment Schemes Ltd (which became a separate company in December 2003) and its infrastructure supplier Voca have established, reviewed and mutually agreed incident escalation processes. The C&CCC has established a pool of Alternate Directors and Emergency Alternate Directors, who can, if necessary, substitute for regular Directors to ensure that a conference call of the Board can be held within 90 minutes.

APACS, the UK payments industry trade association, has also reviewed whether its decision-making process is suitable for crisis situations. APACS, and its Executive Committee, have a role in responding to events requiring cross-scheme co-ordination. Amendments have been made to the Executive Committee's terms of reference to ensure a quorum can be formed readily in an emergency even if some individuals are unavailable. APACS has updated relevant communication mechanisms and procedures including out-of-hours, remote and emergency arrangements. APACS has also co-ordinated work to embrace the lessons of a desk-top contingency exercise in late 2003. Conclusions from that exercise were similar to the good practices recommended in the Task Force's Report and have been incorporated, where applicable, into the *APACS Best Practice Guidelines on Risk Control* which are used by CHAPSCo, BPSL and the C&CCC.

The Bank also discussed Recommendation 3 with CLS and SWIFT (as the Bank of England takes part in the co-operative international oversight of these systems). CLS has continued over the past year to enhance its crisis management capability. Flexibility to respond to major operational disruption has been increased by establishing out-of-region contingency arrangements. Procedures for dealing with the liquidity issues that might arise if CLS settlement members were unable to make pay-ins have also been reviewed by CLS and its overseers as part of preparations for bringing new currencies into the settlement arrangements. Some enhancements have been made.

SWIFT established the SWIFT Crisis Co-ordination and Communication group (SC3) in late 2003, and it convened in early 2004. In the event of major operational disruption to SWIFT services, the SC3 would play a role in ensuring communication with key financial markets and institutions. SWIFT has undertaken to update its crisis logistics models

1: Task Force on Major Operational Disruption in the Financial System (2003) *Do we need new statutory powers?* available at: www.fsc.gov.uk/upload/public/Files/1/tf_report_whole_report.pdf.

in the light of input from the SC3, and has organised a programme of teleconference tests as well as a large-scale crisis exercise to test the processes for dealing with communication during contingency situations. A key next step is further to test the guidance that would be given to SWIFT users in the unlikely event of its services being degraded.

Overall, the Bank considers the reviews and exercises undertaken by the payment systems, and the several new procedures introduced, to be evidence of their commitment to ensure they can take the necessary decisions in the event of major operational disruption. The UK payment systems thus satisfy the letter and spirit of Recommendation 3 in the Task Force's *Report*. It is important, however, that payment schemes continue their regular testing of crisis arrangements, with further change as necessary according to the lessons learnt. It is also important for systems to ensure that their arrangements are adequately publicised to system users, to assist them in their own planning.

The Bank, HM Treasury and FSA jointly published a *Financial Sector Business Continuity Progress Report* in October 2004.[2] This *Report* reviewed progress against the full set of recommendations from the Task Force on Major Operational Disruption and identified priorities for the coming year. The main task for the authorities, working closely with the private sector, is to assess in more detail the resilience of the critical infrastructure and major financial firms against a range of scenarios. A second priority is to continue a programme of testing contingency arrangements, including on a market-wide basis.

2: Tripartite Standing Committee on Financial Stability (2004) *Financial Sector Business Continuity Progress Report*, available at: www.fsc.gov.uk/upload/public/Files/1/report.pdf.

Chapter 4: Issues and priorities for future work

This Chapter adopts a thematic approach to presenting the set of issues which are expected to form the basis of oversight work in the year ahead, and which will be reviewed in next year's *Report*. The starting point for this forward agenda is the summary of the Bank's Core Principle assessments (Table 3).

Broadly speaking, there are three factors which lead the Bank to focus on particular issues. First, the assessments of the systems against the Core Principles identified certain weaknesses that might, in some circumstances, pose a significant risk to the financial system. For example, for a number of the systems, improved management of **settlement risk** (Core Principles III and V) has the potential to reduce the likely impact of a participant default (Section 4.1 below). The degree of **tiering** in the membership of payment, clearing and settlement systems also has the potential to disguise and prospectively increase such settlement and other risks (Section 4.2).

Second, the environment in which payment systems operate is subject to change. Best practices that are more stringent and sophisticated than the Core Principles are now in place in a number of areas. For example, greater emphasis is now placed on the understanding and management of **operational risk** and **business continuity** (Section 4.3). **Governance** is another area where thinking has evolved rapidly over recent years (Section 4.4). It is important that payment systems and other infrastructures keep pace with these new developments.

Third, the changing infrastructure landscape internationally, and, in particular, the greater cross-border consolidation of infrastructure providers, also poses new challenges for risk management. Enhanced frameworks for **co-operative oversight** are needed to deliver effective supervision and oversight (Section 4.5). A particular example of how the Bank is involved in such work is the prospective new payment arrangements to support CREST as a result of the **merger with Euroclear** (Section 4.6).

Another way of understanding the Bank's forward agenda on oversight is to consider the risks to which the UK payment infrastructure is exposed. As described in Chapter 1, there are two such sets of risks: risks arising from the knock-on effects of failure by a single participant; and risks arising from network dependencies among all system participants.

The payment system agenda over the past decade or so has focused principally on mitigating the first set of risks. This is reflected in initiatives to achieve intraday finality of payments through Real-Time Gross Settlement, Delivery versus Payment and Payment versus Payment mechanisms. Some UK payment systems do not have such mechanisms, so there are residual settlement risks to be considered. But thereafter this agenda may be nearing completion.

Looking forward, the greater risk challenges to UK payment systems may come from the key dependencies within, and interlinkages among, these systems. For example, credit risks may arise from indirect membership (due to 'tiering'); or operational risks may arise from failures in the provision of certain outsourced services, including the underlying payments infrastructure; or from the growing interdependencies between systems, domestically and internationally, including dependencies on other parts of a consolidated or cross-border group. The importance of these sources of risk to UK payment systems appears to be rising over time, both relatively and absolutely.

The Bank and other overseers need to ensure these sources of risk are adequately monitored and quantified and, where necessary, additional risk mitigants sought. To that end, the Bank intends to do further work to establish a **risk-based framework for its oversight** (Section 4.7).

4.1 Settlement risk in payment and settlement systems

Transactions give rise to a pair of obligations between two counterparties: the obligation of the 'seller' to provide assets, goods or services; and the corresponding obligation of the 'buyer' to make payment. The possibility of non-performance by one or both of the parties to a transaction (or the failure to fulfil an obligation on time) represents a source of risk. These risks fall under three main headings:

- **Replacement cost risk** is the risk that the failure of a party to fulfil its obligations forces its counterparty to seek another trading opportunity, possibly on less favourable terms (or if no acceptable trading opportunity is available, not to trade at all). This risk is likely to increase the longer the delay between a trade occurring and the delivery of, or payment for, goods/assets.

- **Principal risk** is the risk that one party loses (up to) the full value of the trade if it satisfies its obligation but the other party does not. This risk is most likely to arise if the times at which the delivery and payment legs of a trade take place are different.

- **Conditionality risk** arises when the recipient of either delivery or payment acts as if its counterparty has fulfilled its obligations before it has actually done so. This risk would be particularly likely to arise when a payment or settlement system transmits information to the receiving participant before final settlement takes place.

Settlement of transactions through payment and settlement systems may lead to a significant change in the distribution of these risks. Risks which originally resided with the direct counterparties to a trade may become concentrated on systems and their participants. Consequently, central banks in a number of countries have supported a range of initiatives aimed at reducing settlement-related risks arising within these systems.

For example, many central banks have encouraged members of large-value payment systems to eliminate conditionality risk on the payment leg of transactions by implementing Real-Time Gross Settlement (RTGS).[1] This ensures that, for each individual payment, the transfer of funds takes place immediately. In most cases, details of incoming payments are not released to recipients until they have settled with finality. Further significant reductions of risk have been achieved in many countries by eliminating the principal risk that arises between members of securities settlement systems. Typically, this is achieved by settling the delivery leg of a trade if, and only if, the payment leg is settled (Delivery versus Payment or DvP).[2]

Developments in CHAPS, BACS, the C&CC, CREST, LCH.Clearnet Ltd and CLS over the past decade have significantly reduced settlement-related (replacement cost, principal and conditionality) risks in the UK infrastructure. Nevertheless, there are a number of areas where further work to control these risks is in train. These include:

(a) CHAPS

Conditionality risk can still arise between settlement members in CHAPS Sterling in certain contingency situations. In the event of an operational problem at the Bank of England that prevented the settlement of CHAPS payments on an RTGS basis, CHAPS Sterling would operate in 'RTGS bypass mode'; that is, as a multilateral deferred net settlement system. Members of CHAPS have committed to consider – following completion of similar work in BACS and the C&CC (see below) – how the default of a member in a net debit position would be handled while in bypass mode.

(b) BACS and the C&CC

Members of BACS and the C&CC have been working to put in place a *Liquidity Funding and*

1: In the United Kingdom, CHAPS Sterling was converted to an RTGS system in 1996.

2: In the United Kingdom, CREST began to settle sterling- and euro-denominated trades on a real-time DvP basis in 2001. The range of assets settled in CREST was expanded to cover money market instruments in 2003. CLS began settling foreign exchange transactions in seven currencies on a Payment versus Payment (or PvP) basis in 2002 to achieve similar risk-reducing benefits.

Box 5: Reducing settlement risk in retail payment systems

The proposed *Liquidity Funding and Collateralisation Agreement* ("the Agreement") covering BACS and the C&CC will strengthen significantly these systems' compliance with the relevant Core Principles (see Chapter 3 and Annexes D and E). However, even once this is completed some settlement risk will remain in these systems. Surviving members may incur losses if any shortfall arising from a failure to pay is greater than a defaulter's collateral. And since neither system has any means of limiting exposures, a small risk will remain that settlement cannot complete. Furthermore, the proposed liquidity commitment and collateral pool are designed to cover peak end-of-day positions of around £2 billion. These are believed to be smaller than peak intraday exposures. This box describes some of the options for further mitigating settlement risk in these systems.

Capping peak exposures

Under the Agreement, members will agree to fund a shortfall up to the peak exposure to any member in the previous twelve months. But since future exposures are uncapped, a small risk will remain that a failure to pay could still give rise to a liquidity shortfall greater than this amount. For example, in situations of financial stress that might accompany a member default, exposures between members may become atypically large. Indeed, exceptionally large exposures among members may be one of the catalysts for member default. In this event, settlement in one or both systems would be disrupted.

One way in which this risk – in both normal and stressed situations – might be reduced is if limits are imposed on the size of end-of-day exposures among participants. It is likely to be possible to introduce the technical ability to cap debit positions in BACS as part of the NewBACS infrastructure renewal project (see Chapter 3).[1] Members will need to consider carefully the operational implications of caps before they are put in place – for example, because of their impact on system efficiency. But suitably designed and calibrated, debit caps could usefully constrain residual settlement risk.

Shortening inter-member exposures

Both BACS and the C&CC currently operate on a three-day interbank clearing cycle. Positions in respect of payments submitted to the system on day 1 are not settled until day 3. There are, therefore, up to three open cycles at any one time. This increases the aggregate level of exposures between members of the system.

One way of reducing the length, and hence size, of these exposures between members would be to bring forward the interbank settlement from the morning of day 3 of the clearing cycle to the afternoon of day 2. The Bank has encouraged members to consider the costs and benefits to them, and their customers, of such a move.

Exposures could be reduced further in BACS if payment instructions involving a failed member which were input on the day of a default (for value and settlement two days later) were removed from the system. Removing intraday exposures on the day of default would reduce the risk that the shortfall arising from a default would be larger than the liquidity committed under the Agreement. It would also reduce the number of settlement cycles for which exposures exist at any one time. The necessary system changes to deliver this outcome are another feature that could potentially be delivered as part of the NewBACS project.

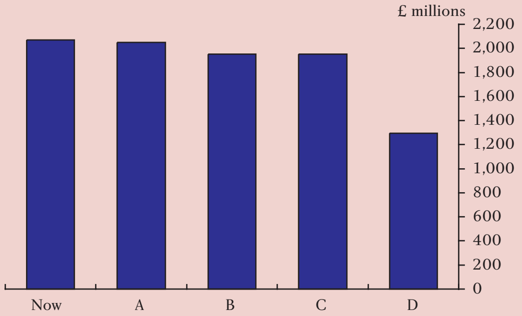
Shortening the length of the clearing cycle by one day could lead to a substantial decrease in the level of exposures among participants. Over the period September 2003 to August 2004, the largest reduction in the exposure to a single member resulting from a one-day reduction in the BACS and Cheque interbank clearing cycles would have been £876 million and £896 million respectively. It is also possible that shortening the interbank clearing cycle would reduce the peak

1: There may be significant obstacles to implementing caps on members' multilateral net debit positions in the C&CC.

exposure to any member – and hence, potentially, the size of the liquidity commitment and collateral pool required under the Agreement.

Chart 15 shows the size of the collateral pool under various alternative models: model A involves shortening the BACS cycle by one day; model B shortens the Cheque cycle by one day; model C shortens both BACS and the Cheque cycle by one day; and model D shortens both cycles by one day, while also removing from the BACS system payments due for value two days after an insolvency. Under model D, the aggregate sterling collateral requirement would be reduced by just under 40%, from around £2.1 billion now to around £1.3 billion.

Chart 15:
Size of collateral pool under alternative models for BACS and the C&CC[(a)]



Sources: APACS, Voca and Bank calculations.
(a) An explanation of Models A-D can be found in the text.

Enhanced netting of exposures

Members of the clearings could also reduce exposures to a failed member if the contracts that they signed allowed them to offset amounts due from the defaulter with amounts due to the defaulter on other days. This netting arrangement would reduce the amount of collateral required under the Agreement by approximately 15%, from around £2.1 billion to around £1.8 billion. Implementing both shorter clearing cycles and enhanced netting would result in greater reductions in risk than implementing either change individually.

Collateralisation Agreement designed to ensure timely settlement following a member default. Once this is implemented, members intend to consider how this Agreement might be strengthened and how levels of exposure might be reduced further. Box 5 describes some of the ways in which this might be achieved.

(c) US dollar settlement in CREST

The interbank settlement arrangements supporting the US dollar-denominated transactions in CREST are not as robust as those for sterling and euro. This creates a number of settlement-related risks for the US dollar settlement banks. The possibility of developing a suitably robust multilateral net settlement is being investigated by CRESTCo and the settlement banks, with the support of the Bank.

(d) LCH.Clearnet Ltd concentration bank

LCH.Clearnet Ltd and the Bank's operational and oversight teams are devising arrangements for the Bank to take on the role of concentration bank for payments in sterling and euro. Looking forward, it would be desirable similarly to improve the safety of the payment arrangements in US dollars operated in the United Kingdom.

(e) CLS

Recent estimates show that a significant share of global foreign exchange transactions continues to be settled outside CLS. CLS is working with its settlement members to bring more participants into the system as 'third-party users' (whose transactions are settled on their behalf by settlement members). Other work includes a project to investigate the feasibility of adding further settlement windows to allow same-day trades in some currencies to be settled in CLS.

4.2 Tiering in UK infrastructures

There are several generic risks to which tiering in financial infrastructures can potentially give rise.[3] In a tiered market, direct – first-tier – participants offer payment, settlement or infrastructure services to banks in a second tier, which in turn offer settlement services to non-bank customers. Often, first-tier members offer intraday overdrafts to their correspondent customers to facilitate the provision of these services. So a tiered market structure may generate *counterparty credit risk* between first- and second-tier participants, to the extent that these intraday exposures are not fully collateralised.

Two other risks also typically arise from tiering. First, the legal framework underpinning a particular infrastructure is typically more robust for payments made between direct participants than for payments involving indirect participants. In consequence, tiering often exposes system participants to increased *legal risk* (relative to a less tiered structure). Second, a tiered market structure may lead to the concentration of payment activity on a small number of first-tier banks. Operational problems in one of these banks may then prevent second-tier banks from sending and/or receiving payments, such that there is an overall increase in *operational risk*.

At the same time, a tiered structure may also deliver some efficiency benefits for at least some participants – for example, if the costs of joining a payment system are high for a bank relative to its volume of business. These efficiency considerations need to be weighed against potential systemic risks when gauging the optimal degree of tiering in market infrastructures.

Over the past year, the Bank has carried out work to understand better and quantify the risks associated with the tiered structure of CHAPS. Survey evidence suggests that unsecured credit exposures between first- and second-tier banks, though sizeable in absolute terms, are a relatively small percentage of the total capital of first-tier banks. This suggests that, in normal circumstances, the systemic risks posed by tiering in CHAPS may be relatively limited. This evidence may, however, seriously understate the *potential* exposures which might arise between direct and indirect participants in stressed conditions. Survey evidence also suggests that correspondent banking activity is concentrated on a small subset of CHAPS members.

3: These risks are considered in more detail in the Bank's December 2004 *Financial Stability Review* (pages 77–81), available at: www.bankofengland.co.uk/fsr/fsr17art4.pdf.

The heavy dependence of UK payments on a limited number of direct CHAPS members has led the Bank to examine potential barriers to membership of CHAPS. It is also hoped that the proposed reform of the Bank's operations in the sterling money markets will encourage more banks to join the system. Over the next year, the Bank will review progress on both fronts and, if necessary, assess alternative risk mitigation strategies.

Much less work has been done to date on the risks associated with tiering in the payment arrangements of CREST, CLS and LCH.Clearnet Ltd. For example, CREST is characterised by a structure in which 15 settlement banks with accounts at the Bank make and receive payments on behalf of 41,000 CREST members; more than 2,200 of these members are financial institutions. Of CLS's 56 settlement members, around half were offering third-party services to over 200 third-party users at the end of December 2004. The embedded payment arrangements used by LCH.Clearnet Ltd are also tiered, with only eight of the 14 banks that provide Protected Payments System (PPS) services in sterling being CHAPS settlement banks.

Over the next year, the Bank aims to look into the implications of such tiering in more detail. As part of this, the Bank plans to compare the degree of tiering in CREST and LCH.Clearnet Ltd with that of equivalent systems in other countries. The Bank also plans to attempt to calibrate tiering risks as they apply to CREST, CLS and LCH.Clearnet Ltd, taking into account the specific nature of those systems. Thereafter, it should be possible to assess what, if any, further risk mitigation might be appropriate. The results of this analysis will be published in next year's *Report*.

4.3 Operational risk and business continuity planning

Operational risk is typically defined to cover vulnerabilities arising from failures or inadequacies in processes, people and systems, or from events external to an institution. Operational risks have become more acute as a result of greater financial market integration and globalisation; increased complexity of financial products; increased reliance on rapidly evolving technology and systems; and the greater use of outsourcing. In turn, many of these developments have led to the increased concentration of operational risk in major market infrastructures – for example, CREST-Euroclear, CLS and LCH.Clearnet Ltd.

Operational vulnerabilities in payment systems are important both because they can exacerbate existing credit and liquidity risks and because they can lead directly to disruption of the financial system. Growing linkages between systems – for example, as a result of the introduction of CLS – and increased dependencies on certain providers – such as SWIFT – potentially make the consequences of operational events more serious and widespread. As a result, ensuring that sufficient weight is given to operational risk management in the design and operation of payment systems has become an increasingly important focus of the Bank's oversight work.

In the Core Principles, operational risk issues are covered by Core Principle VII. This sets minimum standards for the operational robustness and security of payment systems, as well as covering business continuity arrangements. In its assessment of key UK payment systems against the Core Principles (Table 3), the Bank found that the major systems generally have a good record of operational reliability and at least broadly observe Core Principle VII. Given the above trends, however, payment systems may in future need to achieve levels of operational risk management beyond the minimum standards set out in the Core Principles if systemic risk is to be mitigated adequately.

Developments in operational risk management

Traditional operational risk management has often relied on internal control systems, supplemented by internal audit. In recent years, new approaches have extended these methods. Banks have been encouraged by the Basel Committee on Banking Supervision (BCBS) to strengthen risk management practices. Indeed, under the New Basel Capital Accord banks will be required to hold capital for their operational risks.[4]

4: BCBS (2004) *Basel II: Revised international capital framework*, available at: www.bis.org/publ/bcbsca.htm.

The BCBS considers best practice to be the implementation of an institution-wide framework for operational risk management. The framework should set a common definition of operational risk across the institution, specify the institution's tolerance for operational risk and lay down principles on how operational risk will be identified, assessed, monitored and controlled/mitigated. The framework should be approved (and periodically reviewed) by the institution's Board and implemented by senior management. Auditors (either internal or external) should verify that the framework has been implemented properly.

As part of their operational risk framework, many banks are using new techniques to strengthen the day-to-day management of risk. Tools such as self-assessments and risk-mapping exercises are used to ensure that operational risks have been correctly identified and assessed. Monitoring of operational risk has been strengthened by using central information systems, such as event databases. Forward-looking risk indicators have also been developed that provide early warning of increased operational risk because of factors such as rapid growth, structural change, the introduction of new products, employee turnover and system downtime.

Oversight of operational risk

In its oversight work, the Bank has used a number of approaches to ensure that operational risk in payment systems is addressed appropriately. One approach has been to seek compliance with the standards for operational robustness, security and governance set out in the Core Principles.

A second approach has been for the Bank to highlight and target systemic operational risks in payment systems, as and when they arise. Examples have included work on issues with a cross-system dimension, such as strengthening business continuity and contingency planning (see Box 4).

A third approach has been to expand the Bank's information on operational risk in payment systems by identifying and collecting data on operational incidents. External audit assessments such as SAS 70 reports, and meetings with the auditors to discuss these assessments, can provide useful inputs. Over the coming year, the Bank will be looking to improve its coverage of operational information on the major systems and will seek meetings with external auditors.

A fourth approach has been to contribute to the general understanding of operational risk by carrying out and publishing research. For example, in *Assessing operational risk in CHAPS Sterling: a simulation approach*,[5] Bedford *et al* (2004) carried out a simulation exercise to assess quantitatively the ability of CHAPS Sterling to withstand certain types of operational disruption. The Bank intends to conduct further research on the resilience of payment systems over the coming year.

A final major stream of oversight work over the next year will be to assess systems' approaches to operational risk management in the light of evolving best practices. By making comparisons of operational risk management practices across payment systems, the Bank hopes to identify and disseminate best practice.

Business continuity planning

In its assessment of systems against the Core Principles, the Bank found that most UK payment systems already have well-established and effective business continuity arrangements. Areas for further work include ensuring that systems have appropriate procedures to deal with capacity constraints in the event of prolonged system outages and effective guidance for members in the event of a major operational disruption. The Bank will also continue to monitor progress made by systems in the light of Recommendation 3 of the Task Force on Major Operational Disruption in the Financial System (Box 4).

During 2005, the Bank will be taking part in a Tripartite (FSA, Bank and HM Treasury) exercise to benchmark the resilience and recovery capability of critical components of the UK financial architecture, including payment systems. This

5: Bedford, P, Millard, S and Yang, J (2004) Bank of England *Financial Stability Review*, June, pages 135–143, available at: www.bankofengland.co.uk/fsr/fsr16art5.pdf.

exercise will take place collaboratively with market institutions and infrastructures.

4.4 Corporate governance and financial infrastructures

Corporate governance has been the focus of a number of recent initiatives to develop best practices. Notable examples include the *Sarbanes-Oxley Act* in the United States in 2002; the UK *Combined Code on Corporate Governance* revised in 2003; and the revised OECD *Principles of Corporate Governance* in 2004.

Good governance is also recognised as a key principle of well-functioning financial infrastructures. For example, Core Principle X states that, "The system's governance arrangements should be effective, accountable and transparent… should provide accountability to owners… and, because of the system's systemic importance, to the wider financial community". Governance is also central to the CPSS/IOSCO *Recommendations for Securities Settlement Systems* (2001) and the G30 *Action Plan on Global Clearing and Settlement* (2003).

Governance standards potentially play at least three useful roles in payment systems oversight, each of which can be seen as helping fill a market or regulatory gap:

(a) **Principal-agent problems:** effective governance structures can help ensure congruence between managerial and owner incentives and objectives, including helping ensure risk mitigation is adequately weighed in decision making.

(b) **Systemic risk:** governance structures can help ensure the risk preferences of participants in the system are recognised in its decision making – for example, by having them represented on the board. Governance structures may also help in recognising risks that affect those who are neither direct users nor owners of the system – for example, by having independent or 'public interest' representation on the board. These considerations become more important the greater the systemic importance of the system.

(c) **Self-regulation:** if the incentives and objectives of the board are aligned with the public good, this may reduce, or even possibly eliminate, the need for separate regulatory action. There will, in effect, be self-regulation. This might be desirable to minimise the regulatory burden.

The governance structures of the major UK and international payment systems already perform at least some of these roles. For example, many infrastructures organise themselves as co-operatives, with participants in the system also its owners. This can be helpful because each participant then has a direct stake in ensuring the safety and resilience of the system. Most of the main payment systems in the United Kingdom are member-owned and not-for-profit – for example, CHAPS, BACS, and the C&CC. SWIFT is also a co-operative.

However, the systemic importance of many market infrastructures extends beyond their direct community of participants and owners – for example, to the general public. Mechanisms for taking account of public interests include public consultation, market advisory and user groups, and dialogue with public authorities. In addition, some independent or public interest representation might, in the Bank's view, be desirable to help emphasise these wider systemic objectives. For example, LCH.Clearnet Ltd and Euroclear have independent directors on their boards and LINK has appointed independent chairmen.[6] The main UK payment systems (CHAPS, BACS and the C&CC) do not currently have independent directors. SWIFT also does not currently have board representatives from outside its member community.

There may be greater scope for using governance best practice to support oversight objectives. This might be particularly useful when other regulatory tools are not available or are limited. The Bank intends to explore some of these recent governance initiatives – for example, the case for independent representation on the Board – with the major UK payment systems.

6: In March 2004, the FSA issued guidance to the UK Recognised Bodies, including CREST and LCH.Clearnet Ltd, on corporate governance, including recommendations on the appointment of independent directors.

Governance initiatives might also be useful when overseeing cross-border infrastructures which operate in multiple legal jurisdictions. Such entities are becoming increasingly important to the UK financial system – for example, SWIFT, CLS, the Euroclear group and LCH.Clearnet Ltd.

4.5 Co-operative oversight models

In the United Kingdom, as in some other countries, a growing proportion of the systemically important infrastructure is located in, operated or managed from foreign countries. For example, the Euroclear group plans to build a single settlement engine, with operating centres in France, and operated by a company incorporated in Belgium, to support securities settlements in all the markets it services, including the United Kingdom. LCH.Clearnet Group also intends to introduce a common IT platform for clearing services in each of the markets it serves. CHAPS and, to a lesser extent, CREST depend on SWIFT operations centres located outside the United Kingdom. For the UK authorities, it is therefore critical that co-operative arrangements and the MoUs supporting the oversight of these infrastructures enable effective leverage over decisions that influence systemic risk in the United Kingdom.

Co-operative oversight between central banks raises many of the same issues as arrangements to co-ordinate the supervisory responsibilities of home and host regulatory authorities. In both cases, co-operative frameworks aim to respond to the increasing internationalisation of financial markets and institutions by designing supervisory arrangements that avoid gaps and reduce the risk of inconsistent policies, while eliminating unnecessary regulatory burdens.

For some financial institutions, and perhaps especially for systemically important payment and settlement systems, co-operative oversight or supervisory arrangements are necessary to ensure appropriate mitigation of systemic risk. Without co-operation, there is a risk that authorities in 'host' countries where a payment system is systemically important do not have adequate powers or influence over a system because it is incorporated abroad. Conversely, 'home' authorities with effective powers might not give sufficient priority to the systemic risk concerns of overseas authorities.

To ensure a match between responsibilities for co-ordinating oversight and incentives to conduct this oversight, the systemic importance of a system to participating central banks and supervisors should be a key factor in the choice of co-ordinating authority. Without prejudice to the existing responsibilities of home or host authorities, this argues for a degree of flexibility over which authorities should co-ordinate oversight arrangements, rather than a mechanistic choice of either home or host authority.[7]

Responsibility for co-ordinating oversight should ideally be matched by appropriate powers over the system. So the existence of legal powers enabling an authority to obtain information and to enforce mutually agreed policies is another key factor in the choice of co-ordinating overseer. The strongest legal powers will often reside with the authorities of the country in which the institution is incorporated – that is, the home country.

Flexibility in the choice of co-ordinating authority has proved especially useful in the case of CLS, which comprises a holding company incorporated in Switzerland, a bank incorporated in the United States and an operations centre in the United Kingdom. All central banks issuing currencies settled by CLS, and for which CLS is systemically important, have agreed that the US Federal Reserve is best placed to lead the co-ordinated oversight because of its statutory supervisory powers over CLS Bank. The Federal Reserve accepted this responsibility.

Given the importance of cross-border infrastructures to the UK financial sector, the Bank attaches a high priority to strengthening the co-operative oversight arrangements for these infrastructures. SWIFT provides a good example. The National Bank of Belgium (NBB), as lead overseer, has established a new 'Protocol' with SWIFT, strengthening and clarifying channels of

7: The regulation of multinational providers of infrastructure services was discussed in the Bank's June 2004 *Financial Stability Review*, pages 69–71.

communication with overseers. Central banks participating in the co-operative oversight have worked to draw up MoUs between themselves and the NBB to support these arrangements.

New MoUs have also been drawn up for LCH.Clearnet Ltd and Euroclear. These will come into effect over the coming year. Arrangements for information sharing are covered in both MoUs, which preserve local regulatory responsibilities but allow for common assessments against the benchmark of the CPSS-IOSCO recommendations for securities settlement systems and central counterparties (Box 2). They also formulate arrangements for consultation between authorities before the implementation of policies potentially affecting multiple countries, and for co-ordinating a common response by overseers and supervisors to proposals of mutual interest. Experience with these MoUs over the coming year should indicate whether these arrangements enable all participating authorities satisfactorily to fulfil their individual responsibilities.

The Bank is also investigating, with fellow overseers, whether the oversight of card schemes might benefit from some degree of international co-ordination and information gathering. The need for such co-operative oversight depends in large part on an assessment of systemic risk, so in this case the co-ordination might be less intense than for some other systems.

The Bank intends to review in next year's *Report* the degree to which these international co-operative arrangements have enabled the Bank to fulfil effectively its responsibility for oversight of the UK financial infrastructure.

4.6 Operational implications of the CREST-Euroclear merger

Following the merger of CRESTCo with Euroclear, the implementation of Euroclear's long-term business plan will have a major impact on the operation of the sterling and euro embedded payment arrangements supporting settlement in CREST. A key feature of the Euroclear business model, and one that affects central banks directly, is the proposed harmonisation of central bank money settlement across and between the group's securities settlement systems.

One proposal is for the process of central bank money settlement to be outsourced to Euroclear's new settlement platform. This 'integrated' settlement model would involve having the settlement accounts, and movements across them, located on the Euroclear platform. CREST sterling and euro settlement currently operates on a partially integrated basis, under which the central bank money accounts remain under the control of the Bank, which redistributes account balances on the basis of information received regularly from CREST.

Full outsourcing of central bank money settlement would need to be accompanied by adequate information, controls and safeguards from a central bank perspective, since it is ultimately its balance sheet at stake. The Bank's oversight and operational departments are working closely with other interested central banks and with Euroclear to define such safeguards. In particular, mechanisms will need to be in place so that:

- central banks have very high frequency information on the use of central bank money, including on transfers of balances/liquidity to/from the settlement platform, and, where appropriate, on liquidity generated via automatic collateralisation;[8]

- central banks get a range of detailed, historical information to allow analysis of, for example, liquidity usage, throughput performance etc;

- central banks have the ability to limit credit provision/automatic collateralisation intraday, either through quantitative intraday limits or by adjusting the range of collateral accepted; and

- settlement will be suspended immediately should uncollateralised central bank overdrafts be created. To mitigate the risk that this 'circuit breaker'

8: Automatic collateralisation facilities enable participants in a securities settlement system to use certain categories of securities held in that system as collateral for raising additional central bank liquidity, so as to facilitate the settlement of transactions. The liquidity may be generated using a participant's existing security holdings within the system or (as is the case in the United Kingdom) using the securities being purchased in the transaction in question.

might fail, the Bank is likely to want the capability to suspend settlement until the situation is rectified.

The introduction of the new settlement platform will also change fundamentally the operational linkages and business continuity arrangements for Euroclear group entities. Supervisors and central banks will need to seek to ensure that Euroclear's operational risk management and business continuity planning is at least as robust as current national arrangements. Indeed, levels of resilience may need to be higher than those of current national arrangements, given that transaction processing for several countries' securities markets will be concentrated on a single platform.

4.7 A new risk framework for oversight

Although central banks have for many years had responsibility for overseeing the safety and soundness of national payment systems, formal oversight of these systems is a relatively recent phenomenon. For example, the Bank of England set up a dedicated payment systems Oversight Team in 2000. The framework within which oversight operates is still evolving, both at the Bank and internationally. So too are the risks to payment systems, with greater dependencies between systems and greater reliance on outside suppliers of infrastructure services.

Against this backdrop, the Bank is aiming to strengthen the framework within which oversight is conducted. The aim is to put in place a more structured process through which payment system risks can be identified and subsequently prioritised. This framework should help to determine the appropriate allocation of oversight resources between the systems which the Bank oversees; ensure that risks are looked at in a consistent and comprehensive fashion across systems; and, more generally, ensure transparency of the oversight process. Some regulatory bodies have recently put in place risk frameworks serving similar purposes.

The intention is to have the new risk framework for oversight operational within the course of the coming year and to report on progress in the next *Report*. This will be a significant exercise and is likely to draw on expertise from outside the Bank. In addition, the Bank is aiming to intensify the training of its overseers.

In parallel with these developments, further work is planned on two other aspects of the oversight framework. The first is a more complete quantitative articulation of the systemic risk associated with each of the overseen systems (Box 1). This should help in determining the appropriate scope of the Bank's oversight responsibilities. The second is a better understanding of the various instruments, actual and prospective, available to overseers to carry out their functions. The current set of such instruments varies markedly across central banks (Table 1). To carry out effective oversight of payment systems, it will be important to establish that the current set of oversight instruments is adequate to meet the Bank's responsibilities.

The next *Report* will update on progress on these initiatives.

Annexes to Part II: Detailed assessments of payment systems

The CPSS *Core Principles for Systemically Important Payment Systems* set out the types and level of risk mitigation that should be exhibited by a safe and efficient payment system. They provide a benchmark for central banks in their oversight function, aiding the identification of relative areas of strength and weakness in the design or operation of particular payment systems. The CPSS report also incorporates four responsibilities of central banks, which include overseeing compliance with the Core Principles. These Annexes contain the Bank's assessments of some key UK payment systems against the Core Principles.

The intensity of the Bank's oversight is proportionate to its assessment of the systemic risk posed by a system (Box 1). The Bank therefore encourages the most systemically important systems to observe fully all the relevant Core Principles. These include CHAPS and the embedded payment arrangements supporting CREST settlement. For other systems, performing an assessment against the Core Principles is also an appropriate way to benchmark the system. But the type or quantity of payments through the system, or the availability of substitute payment mechanisms, might mean that full compliance with all of the Core Principles would not be necessary. This is likely to be the case for BACS; the PPS operated by LCH.Clearnet Ltd; the Cheque and Credit Clearings (C&CC); LINK; and the debit and credit card schemes operated by Visa Europe, MasterCard Europe and S2 Card Services.

The assessment of embedded payment arrangements is useful in judging the safety and efficiency of mechanisms for effecting the cash transfers resulting from securities settlement or from the activities of a central counterparty. But these embedded payment arrangements cannot be divorced from the design and operation of the settlement system or central counterparty they serve. These too need to be assessed, in this case against the relevant CPSS-IOSCO Recommendations. In addition, the management of some risks in embedded payment arrangements may not be entirely within the control of the operator of the system. For example, final settlement may be dependent on arrangements and procedures outside the system itself. The governance of such embedded payment arrangements may be more complex due to this dependency on outside agents or systems.

The following text is divided into five Annexes, covering: CHAPS; the embedded payment arrangements supporting CREST; the PPS operated by LCH.Clearnet Ltd; BACS; and the C&CC.

A. CHAPS

CHAPS is the United Kingdom's high-value payment system, providing members with Real-Time Gross Settlement (RTGS) of credit transfers. CHAPS consists of two systems: CHAPS Sterling and CHAPS Euro, which – as their names suggest – provide settlement facilities for sterling and euro payments respectively. The following assessment covers both systems. Where the Bank assesses observance with the Core Principles to vary between the two, this is identified.[1]

I. The system should have a well-founded legal basis under all relevant jurisdictions.

The CHAPS *Rules* are clear and comprehensive and appear to provide an adequate contractual basis for the system's operation. CHAPS has been granted designation under the *Financial Markets and Insolvency (Settlement Finality) Regulations* (1999) (the 'UK settlement finality regulations'), implementing the EU *Settlement Finality Directive* in the United Kingdom. Taking into account these regulations and the general principles of English law, the Bank judges that the legal basis for the enforcement of rules governing irrevocability of instructions, finality of settlement, default arrangements and collateral security is robust. The protections afforded under the UK settlement finality regulations extend equally to CHAPS Sterling and CHAPS Euro payments.

CHAPS members' relationship with the Bank of England, as provider of settlement accounts, is governed by contracts (the *RTGS Mandate* and the *Master Repurchase Agreement*). As a condition of continued membership, members are also obliged to comply with the technical and operational requirements of the CHAPS systems. CHAPS members do not, however, sign formal contracts or acknowledgements committing themselves to abide by the *Rules* and decisions of the CHAPS Board. To date, the lack of a formal contract or acknowledgement by members has not given rise to any risk concerns – relying on the basic principle of English law that if a member enters payments into the system, then that member can be regarded as having accepted the rules of the system by conduct. However, given that BACS Payment Schemes Ltd has already established such contracts, and the Cheque and Credit Clearing Company has also decided to do so, the situation as regards CHAPS could be usefully reviewed.

CHAPSCo has commissioned further legal work to confirm that where settlement membership is held by a branch of a bank incorporated overseas, these members have the authority to commit themselves to abide by the CHAPS scheme rules, and that the home-country legal system of the parent bank would not interfere with the member's ability to fulfil its obligations. This legal work would complement the Bank of England's own requirement for legal opinions regarding the enforceability of contracts governing the operation of RTGS settlement accounts and the supply of intraday liquidity by the Bank to all overseas/non-UK incorporated holders of RTGS settlement accounts.[2]

Pending the outcome of CHAPSCo's work on legal opinions, **the Bank assesses CHAPS broadly to observe Core Principle I**, and, with satisfactory legal advice, would upgrade that assessment to full observance.[3]

II. The system's rules and procedures should enable participants to have a clear understanding of the system's impact on each of the financial risks they incur through participation in it.

The CHAPS system, in common with most RTGS systems, is in principle a simple one, and the risks associated with it should be readily identifiable by members. The *CHAPS Rules* set out high-level rights and duties of members. The respective

1: An alternative assessment of CHAPS against the Core Principles was carried out by the IMF in 2003 as part of the UK Financial Sector Assessment Programme. The IMF assessed CHAPS to observe fully all nine relevant Core Principles. In 2003, CHAPS Euro was also separately assessed against the Core Principles as part of the assessment of TARGET (see www.ecb.int/pub/pdf/other/assessmenteurolargevaluepayments2004en.pdf). This *Report* updates the Bank's assessment of CHAPS Euro at that time.

2: All CHAPS settlement members must hold such a settlement account.

3: CHAPS also needs to consider some other legal issues, for example, relating to claims over collateral in the contingency situation of 'RTGS bypass mode' in which CHAPS reverts to end-of-day net settlement (see Core Principle V). But the Bank does not consider issues connected with this additional layer of contingency to affect compliance with the Core Principles.

responsibilities of the Bank as operator and settlement agent; CHAPSCo as the scheme governance organisation; and the members are set out in an MoU.

All of the risk management features in CHAPS (with the exception of bypass mode procedures in the event of an operational disruption at the Bank – see Core Principle V) are clearly and comprehensively explained in the *CHAPS Rules* and supporting procedural documentation. The *Rules* were simplified and clarified in preparation for the introduction of NewCHAPS in 2001, with operational issues moved to other documents.[4] A clear hierarchy is now in place comprising rules, high-level procedures and detailed operational manuals. Together, these documents cover all aspects of the CHAPS system's operation and design, both in normal running and in contingency situations.

The settlement process does not give rise to credit risk between settlement members other than in bypass mode. Procedures for processing and settlement are covered by the *CHAPS Procedures* and the *RTGS Reference Manual*. The rules relating to the irrevocability and finality of payments are clear. The *Procedures* and the *Reference Manual* also explain the controls and measures aimed at minimising liquidity risk. These include throughput guidelines, operation of 'circles' processing to minimise the risk of gridlock, and the transfer of sterling liquidity in contingency situations (see Core Principle III).

Formal responsibility for determining the *Rules* rests with the CHAPS Board. The Board has delegated responsibility to the CHAPS Legal Committee for ensuring that the *Rules* remain robust and up to date, and for considering proposed changes.

The Bank assesses CHAPS to observe Core Principle II.

III. The system should have clearly defined procedures for the management of credit risks and liquidity risks, which specify the respective responsibilities of the system operator and the participants and which provide appropriate incentives to manage and contain those risks.

In an RTGS system such as CHAPS, the settlement process does not give rise to the credit risk that can be involved in deferred settlement. Domestic payments are both irrevocable and final at the point at which the relevant member's settlement account is debited.

The main form of financial risk associated with Real-Time Gross Settlement is liquidity risk. CHAPS payments cannot be made unless the paying bank has sufficient funds (or liquidity) available on its settlement account with the Bank of England. If there were insufficient liquidity in the system as a whole (or it were not distributed sufficiently well) to permit a regular flow of payments in the course of a day, the result could be gridlock. Liquidity pressures could also arise as a result of time-critical payments – such as those associated with CLS pay-ins – being delayed. However, so far, there is no evidence of CHAPS members experiencing liquidity management difficulties in meeting CLS pay-in deadlines.

To reduce liquidity risk, the Bank provides intraday liquidity to all CHAPS Sterling settlement members, limited only by the availability of eligible collateral. For CHAPS Euro, this credit is limited to approximately €3 billion in aggregate each day.[5] However, members are able to raise additional liquidity within the euro area and transfer this through TARGET to CHAPS Euro. To aid liquidity management, all banks have real-time information on balances and the status of payment messages, with additional real-time monitoring by Bank of England operators. Both central and local schedulers enable members to manage the order in which payments settle, though the majority of members use local scheduling controls. The algorithm that selects payments from the

4: 'NewCHAPS' was the name given to the project to upgrade the technical infrastructure of CHAPS, including migrating CHAPS Sterling to the same IT platform used for CHAPS Euro.

5: Under the terms of the *TARGET Agreement*, intraday liquidity provided by the Bank of England (as a non-euro area National Central Bank) to members of CHAPS Euro is limited to €3 billion (±10%).

Funds Queue also promotes efficient liquidity usage. Payments are selected first by priority (highest first) and then by value (lowest first). In addition, throughput guidelines (the requirements for banks to settle certain proportions of their total payments by certain times), specified by CHAPSCo, are in place partly to stop settlement banks 'hoarding' liquidity.

If liquidity strains do develop in CHAPS, remedial mechanisms are in place. For example, 'circles' processing enables offsetting payments to be settled on a 'simultaneous gross' basis and the 'Sterling Liquidity Contingency Regime' can be invoked if there is risk that liquidity might get drained from the system because of a member's inability to send (but not receive) payments.

Evidence suggests that the procedures currently in place are effective for controlling liquidity risk. Analysis by the Bank shows that system participants have ample liquidity to cope with temporary operational difficulties affecting even the largest members.[6] Banks have consistently demonstrated that they can meet throughput rules: these have not been breached for over a year. Although enforcing throughput guidelines relies on peer pressure, rather than financial penalties, this mechanism seems to have been adequate. The Bank will continue to review this issue.

The Bank recognises that CHAPSCo has taken steps to reduce the credit risk that would arise in RTGS bypass mode, such as the introduction of multilateral net sender caps. Nevertheless, the Bank considers that CHAPSCo should further explore practical and efficient ways of further reducing this potential risk should bypass mode need to be invoked.

The Bank assesses CHAPS to observe Core Principle III.

IV. The system should provide prompt final settlement on the day of value, preferably during the day and at a minimum at the end of the day.

A settlement bank receiving a payment instruction receives value from the paying bank simultaneously and with finality. The designation of CHAPS under the UK settlement finality regulations should prevent successful legal challenge to the finality of settlement in the event of member insolvency. **The Bank assesses CHAPS to observe Core Principle IV.**

V. A system in which multilateral netting takes place should, at a minimum, be capable of ensuring the timely completion of daily settlements in the event of an inability to settle by the participant with the largest single settlement obligation.

This Core Principle is not relevant to CHAPS in normal operational mode as settlement of payments is conducted on a gross rather than net basis. Netting would apply only if CHAPS Sterling's first and second levels of contingency and redundancy proved inadequate and bypass mode were invoked.[7] This has never been necessary.

In bypass mode there are no arrangements to ensure settlement of net obligations could be completed in the event of a settlement member being unable to provide the necessary funds. Since 2003, all commercial bank settlement members have had in place 'net sender caps' to ensure that multilateral net obligations do not exceed unused intraday liquidity that would have been available from the Bank (if details of unused amounts were available) or £1 billion (if information on unused amounts was not available from the Bank). Although net debit positions would therefore appear to be either less than collateral repoed to the Bank or capped at £1 billion, other settlement members do not have a legal claim over this collateral. CHAPSCo has undertaken to examine the case for introducing greater protection in bypass mode once similar work for BACS and the Cheque and Credit Clearings is complete.

6: Bedford, P, Millard, S and Yang, J (2004) *Assessing operational risk in CHAPS Sterling: a simulation approach*. Bank of England *Financial Stability Review*, June, pages 135–143, available at: www.bankofengland.co.uk/fsr/fsr16art5.pdf.

7: There is no bypass mode for CHAPS Euro as members would in most cases have access to alternative euro large-value payment systems in continental Europe.

VI. Assets used for settlement should preferably be a claim on the central bank; where other assets are used, they should carry little or no credit risk and little or no liquidity risk.

Settlement between CHAPS Sterling and CHAPS Euro members takes place by transfers of claims on the Bank of England. **The Bank assesses CHAPS to observe Core Principle VI.** However, only settlement members of CHAPS enjoy the risk reduction benefits of settlement in central bank money. The Bank has been encouraging indirect member banks to consider joining CHAPS, especially if their payments are large.

VII. The system should ensure a high degree of security and operational reliability and should have contingency arrangements for timely completion of daily processing.

CHAPS's security controls and measures appear to be effective. And contingency procedures are tested regularly. The system's record of operational availability is good. External audits of both CHAPSCo's control framework and of the Bank's operations take place every year.

CHAPS's controls are set out in documents such as the *Security Policy* and the *Security Code of Conduct*. The former is a high-level policy description covering end-to-end clearing, which is reviewed annually (or additionally when major changes occur) and approved by the CHAPSCo Board. CHAPS Internal Audit periodically reviews how the policy is being maintained. The *Security Code of Conduct* implements the CHAPS *Security Policy* at a lower level and specifies a range of security controls that CHAPS members and suppliers are expected to have in place. The controls cover, *inter alia*, encryption, authentication and contingency. Members are required to self-certify compliance with the Code annually.

Operation of the core CHAPS processing infrastructure – the RTGS system – is outsourced by CHAPSCo to the Bank. The MoU (see Core Principle II) lists a wide range of performance measures for the Bank, including ensuring that settlement facilities are available on average for 99.95% of the operating day over the course of each month. This was met for ten of the twelve months in 2004. In its assessment of CHAPS in 2003, the IMF noted that CHAPS had experienced some longer outages and emphasised the importance of ensuring that due attention is paid to the assurance and availability of the CHAPS system. Recent RTGS performance provides some reassurance that the frequency of longer outages has diminished.

Both CHAPSCo and the Bank maintain error logs of operational incidents affecting RTGS. Within CHAPSCo, all incidents are reviewed by the Operations Committee, and, if sufficiently serious, are reported to the Company Manager, Audit Committee and Board. Within the Bank, a System Control team maintains an incident log, and outstanding incidents are discussed in internal meetings and with CHAPSCo.

Members also play a key role in the smooth operation of the system and CHAPS places high importance on the resilience and robustness of members' feeder systems and interfaces with CHAPS. The *Procedures* set out various guidelines for the service levels expected of members, and there are arrangements to enable CHAPSCo to monitor and assess members' performance. Under the guidelines, among other requirements, members are expected to minimise requests for 'cut-off extensions' of the daily CHAPS timetable, as they can cause disruptions to other members and have knock-on effects on financial markets. Too many requests for extensions (or other breaches in Service Level Code criteria) can result in a member being asked to appear before a so-called 'Star Chamber'.[8] At the hearing, a member will be asked to set out the steps it is taking to restore its level of service to the expected level. The IMF highlighted the need to monitor the level of extensions with a view to implementing more stringent disciplinary processes than using peer pressure if problems persisted. Since then, the evidence has been mixed. The number and length of extensions to the CHAPS Sterling timetable increased during 2003, compared with a

8: Those present at the 'Star Chamber' hearing include the CHAPS Company Chairman, CHAPS Company Manager and Manager CHAPS Operations and Project Support.

year before. There were fewer extensions in 2004, though they were still more frequent than in 2002. Some further consideration of whether this level of extensions is acceptable would be worthwhile.

In addition to resilience and redundancy in normal operations, RTGS bypass mode provides CHAPS with an extra layer of contingency in which payments can continue to be made even when real-time processing is unavailable. The existence of bypass mode significantly increases the resilience of the CHAPS system.

CHAPS's business continuity and contingency procedures are extensive: members and key suppliers are required to have in place adequate operating procedures (for example, capacity management and change management controls) to minimise the risk of business disruption, and adequate contingency procedures in the event that disruption occurs. Although **the Bank assesses CHAPS to observe Core Principle VII**, it welcomes the consideration CHAPS is giving to further reinforcement of its contingency arrangements.

VIII. The system should provide a means of making payments which is practical for its users and efficient for the economy.

Although charges for customers wanting to use CHAPS for retail payments are typically high relative to the underlying tariffs (which, together with fees, cover the operating costs of CHAPS, including the services provided by the Bank), banks are free to compete in this market. Settlement member banks can also compete freely to attract third-party participants.

RTGS systems impose high liquidity demands on their direct participants, but the Bank can and does provide collateralised intraday liquidity free of charge, and there is no evidence that member banks lack adequate collateral (in part because many current member banks must hold such assets to meet end-of-day regulatory liquidity requirements and are free to use them intraday in the payment system).

Although it is not straightforward to assess the efficiency of a payment system, **the Bank assesses CHAPS to observe Core Principle VIII**.

IX. The system should have objective and publicly disclosed criteria for participation, which permit fair and open access.

The Bank considers the CHAPS access criteria to be objective and fair. These are defined in the *Rules* and are available on the CHAPS website.[9] No applicant has ever been refused membership of CHAPS.

Membership of CHAPS is restricted to financial institutions that hold sterling and/or euro settlement accounts at the Bank of England and have the ability to comply on a continuous basis with the technical and operational requirements of the CHAPS systems as set out in the reference documents. Membership of CHAPS Euro is subject to additional requirements as set out in Article 3 of the *TARGET Guideline*.[10]

The Bank will normally be prepared to provide a settlement account to any member of a payment system for which it is prepared to settle (which includes CHAPS). Differences in facilities offered by the Bank (in particular the availability of intraday credit) are determined using objective, risk-based standards. The Bank's settlement account criteria are available on its website and were assessed by the IMF to be objective and fair.[11]

Since 2001, CHAPS has set an entry fee of £100,000 for new members (considerably less than the £1 million charged previously), justified partly as a contribution to the technical costs of adding new members to the system and partly as a recovery of the development costs of NewCHAPS, which was paid for by existing members. Given depreciation, the case for continuing to recover these development costs from new members appears to

9: www.apacs.org.uk/about_apacs/htm_files/chaps1.htm.

10: www.ecb.int/ecb/legal/pdf/l_14020010524en00720086.pdf.

11: Bank of England (2002) *Bank of England Settlement Accounts*, available at: www.bankofengland.co.uk/financialstability/paymentsystems/boesettleaccs021128.pdf.

be weakening, and the objective justification for the fee may therefore be questioned. The CHAPS Board is reviewing the level of the joining fee.

The Bank assesses CHAPS broadly to observe Core Principle IX. The Bank will review the observance of access criteria against the Core Principles in the light of discussions in the OFT Payment Systems Task Force, and the outcome of the CHAPS review of membership fees.

X. The system's governance arrangements should be effective, accountable and transparent.

CHAPSCo has a clear governance structure, with the Board having ultimate responsibility for the management of the system. The Bank considers the Board exercises effective control over the company's executive. The Core Principles make clear that effective governance provides proper incentives for management to pursue objectives in the interests of the system, its participants, and the public more generally. The CHAPS Board is composed entirely of settlement member banks, which have both the incentives and tools to pursue the interests of the system and settlement members. Incentives for management to pursue the interests of the public more generally are less clear, though the Bank of England provides one of the 18 Board directors. There may be alternative, preferable ways of independent or public interest representation on the CHAPS Board, however, which might be usefully explored. This is more important for CHAPS than for some other systems, given its systemic importance. A number of other infrastructures have recently increased independent representation on their boards. **The Bank assesses CHAPSCo broadly to observe Core Principle X.**

B. CREST

CREST is the United Kingdom's securities settlement system, providing a Delivery Versus Payment (DvP) settlement service for UK securities settled in sterling, euro and US dollars.

CREST has three embedded payment systems:

- Real-Time Gross Settlement (RTGS) in central bank money in sterling;
- RTGS in central bank money in euro; and
- a bilateral net settlement arrangement for transactions settled in US dollars.

This assessment covers all three, differentiating between them as necessary.[1] As noted earlier, embedded payment systems are by their nature collaborative ventures. In conducting this assessment, a distinction was drawn between the systems and procedures operated by CREST, for which CRESTCo is responsible; and the overall payment arrangements supporting securities settlement – that are covered by this assessment – which are a collaboration between CRESTCo, the Bank of England (for sterling and euro settlement) and the CREST settlement bank community.

I. The system should have a well founded legal basis under all relevant jurisdictions.

CREST is designated under the *Financial Markets and Insolvency (Settlement Finality) Regulations* (1999) (the 'UK settlement finality regulations'), which implement the EU *Settlement Finality Directive* in the United Kingdom, so that the finality of both securities and payment transfers (including those effected through all three embedded payment systems) is protected from legal challenge in the event of an insolvency. The protection provided by the UK settlement finality regulations also extends to the CREST settlement banks' arrangements for taking collateral to secure their customers' debit caps. There are bilateral and multilateral contractual arrangements between CRESTCo, the Bank and the CREST settlement banks governing the operation and provision of the DvP payment arrangements in sterling and euro (including the operation of settlement accounts at the Bank of England and the self-collateralising repo mechanism that may be used by CREST settlement banks to generate intraday liquidity from the Bank). These contracts are governed by English law. Even in the case of CREST settlement banks that are the branches of banks incorporated outside the European Economic Area, CREST has obtained legal opinions confirming that these banks have the authority to commit themselves to abide by the relevant rules, and that the relevant home country legal systems of the parent bank would not interfere with that bank's ability to fulfil its obligations. **The Bank assesses the CREST sterling and CREST euro embedded payment arrangements to observe Core Principle I.**

The US dollar embedded payment arrangements are currently supported by end-of-day settlement of bilateral net obligations between pairs of settlement banks. The arrangements for such settlement will be part of the overall relationship that each settlement bank has with its US dollar correspondent in the United States, and fall outside the scope of CRESTCo's responsibility. Although the US dollar arrangements have been given the protection of the UK settlement finality regulations, and involve settlement of bilateral rather than multilateral net obligations, it remains unclear whether the provisions of US insolvency law might prevent completion of an orderly settlement in the United States if a US-incorporated CREST settlement bank failed. **The Bank assesses the CREST US dollar payment arrangements broadly to observe Core Principle I.**

II. The system's rules and procedures should enable participants to have a clear understanding of the system's impact on each of the financial risks they incur through participation in it.

The embedded payment arrangements do not have their own separate rules and procedures; instead, there are rules and procedures governing the DvP arrangements for the three settlement currencies included in CREST documentation (the *CREST*

1: While the assessment focuses on the payment arrangements between the 15 CREST settlement banks, these settlement bank arrangements are underlain by payments between over 41,000 CREST members across Cash Memorandum Accounts (CMAs) held at one or other settlement bank member. Payment obligations arise between settlement bank members when a trade takes place between members that hold CMAs at different settlement banks.

Rules and Manual) and, for the sterling and euro embedded arrangements, in the RTGS documentation (specifically the *RTGS Reference Manual*). CREST documentation also describes in detail the operation of members' Cash Memorandum Accounts (CMAs) and the management of CMA debit caps. This documentation is regularly updated. The US dollar CREST settlement banks appear to understand the risks that arise in the current US dollar settlement arrangements. This has encouraged them to investigate with CRESTCo the possibility of improving the robustness of that payment mechanism, and more specifically to reduce the size and duration of the interbank exposures that the mechanism generates and remove the potential for uncertainty about when finality is achieved (see Core Principles III and IV). **The Bank assesses CREST's payment arrangements to observe Core Principle II**.

III. The system should have clearly defined procedures for the management of credit risks and liquidity risks, which specify the respective responsibilities of the system operator and the participants and which provide appropriate incentives to manage and contain those risks.

Because sterling and euro CREST settlement banks settle their obligations across central bank accounts in real time, these two embedded payment arrangements generate no credit risk between settlement members. There are likely, however, to be credit exposures between settlement members and the members to whom they offer CMAs. CRESTCo provides the technical and legal infrastructure to reduce the exposure of settlement members to second-tier members by means of collateralisation (and such collateralisation has the protection of the UK settlement finality regulations – see Core Principle I). The extent to which uncollateralised credit is granted depends on the terms of the agreement between each settlement bank member and its customer, with responsibility falling clearly to the parties who would bear any losses in the event of default.

Liquidity risk could arise in the sterling or euro payment arrangements if settlement members were unable to raise the liquidity to settle transactions, or unable to repay intraday liquidity provided by the Bank of England. Liquidity can be raised in CREST either by transfer from CHAPS, or, in the case of CREST sterling, by automatic repo to the Bank of England – so-called 'self-collateralisation' – of eligible assets purchased. The mechanism for transferring liquidity between the CREST settlement accounts and the banks' CHAPS settlement accounts has proved reliable and flexible. Settlement banks can consider the two accounts as a 'virtual single pot' of liquidity, with the option of repositioning balances between the accounts after each of the 600-plus CREST settlement cycles each day. The rules on generating and transferring liquidity are set out in the *RTGS Reference Manual*.

It is normally the case that 99% by value of CREST transactions settle on their intended settlement date and there is no indication that liquidity shortages within the embedded payment arrangements are the cause of the failure to settle the remainder. Both the RTGS and CREST documentation describe the responsibilities of the different parties involved in the daily operation of the DvP mechanism in contingency as well as normal conditions. **The Bank assesses CREST sterling and CREST euro payment arrangements to observe Core Principle III**.

The current interbank settlement arrangements supporting CREST US dollar settlement are deficient in a number of respects as regards this Core Principle. The settlement banks take on their CREST customers' gross bilateral payment obligations during the CREST settlement day, and these gross interbank exposures are converted into bilateral net obligations only at the end of the day. These net exposures are not extinguished until the settlement banks' US dollar correspondents have made the necessary payments on their behalf in the United States. To the extent that settlement banks pre-fund their accounts at their US dollar correspondent, then they are also subject to the small but non-zero risk of settlement agent failure until the settlement is completed. Participants, however, have the right incentives to manage these risks. It has only been over the past year that transactions settled in the US dollar embedded payment arrangement have reached significant levels, increasing from a daily average value of

US$500 million at end-2003 to around US$1.5 billion from 2004 Q1 onwards. With CRESTCo and the Bank, the US dollar settlement banks are now investigating a formal multilateral net settlement procedure, supplemented by measures to reduce remaining credit risk and ensure settlement can complete. **The Bank assesses the current US dollar payment arrangement partly to observe Core Principle III**. The level of observance should improve as work on the US dollar interbank settlement arrangement progresses; although full observance for a multilateral net settlement arrangement would require measures to ensure the completion of settlement if a net payer failed to settle.

IV. The system should provide prompt final settlement on the day of value, preferably during the day and at a minimum at the end of the day.

For sterling and euro settlement, the embedded payment arrangements offer real-time finality of the settlement banks' gross obligations at the end of each CREST settlement cycle (the average length of which is between 50 seconds and one minute, though with a very small number of cycles taking longer, occasionally around ten minutes). For the US dollar embedded payment system, finality is achieved when the bilateral interbank payments are settled in the United States. With the time difference, it may be that a settlement bank does not become aware that finality has been achieved until the following morning – and, very occasionally, finality of all bilateral net payments has not been achieved by the end of the day. **The Bank assesses CREST sterling and CREST euro embedded payment arrangements to observe Core Principle IV, and the US dollar payment arrangement partly to observe Core Principle IV**.

V. A system in which multilateral netting takes place should, at a minimum, be capable of ensuring the timely completion of daily settlements in the event of an inability to settle by the participant with the largest single settlement obligation.

None of the CREST embedded payment arrangements currently employs multilateral netting so this Core Principle is not relevant to CREST arrangements. As mentioned under Core Principle III, CRESTCo and the settlement banks are currently exploring the possibility of moving from bilateral to multilateral netting for the US dollar payment arrangement. The Bank considers it important that the multilateral arrangement chosen complies with this Core Principle.

VI. Assets used for settlement should preferably be a claim on the central bank; where other assets are used, they should carry little or no credit risk and little or no liquidity risk.

Interbank settlement in both the sterling and euro embedded payment arrangements takes place in central bank money. Although the tiered nature of the CREST settlement arrangements means that CREST members (ie all non-settlement bank members) receive a claim on a commercial bank (a CMA balance) in final settlement of their transactions, such CMA postings generate an irrevocable instruction to the Bank to debit the settlement account of the buyer's settlement bank and credit the settlement account of the seller's settlement bank.

For the US dollar embedded payment arrangements, the interbank settlement involves transfers of funds between major US correspondent banks. **The Bank assesses CREST sterling and CREST euro payment arrangements to observe Core Principle VI, and the US dollar payment arrangement partly to observe Core Principle VI**.

VII. The system should ensure a high degree of security and operational reliability and should have contingency arrangements for timely completion of daily processing.

CREST achieved an average 99.9% settlement availability in 2004, the same as in 2003. This performance was supported by the high resilience of the embedded payment arrangements, including of the Bank-CREST DvP link on which the day-to-day operation of the sterling and euro payment arrangements rely. If the link between CREST and the Bank of England's accounts were interrupted, or in the event of an operational failure of the Bank's RTGS system, CREST is able to continue settling in 'recycle mode'; this involves CREST continuing settlement using the last verified set of settlement bank liquidity postings, with a contingency facility for banks to top up and draw down such liquidity.

Both CREST and RTGS have back-up processing capability that can be made fully operational within an hour of a major failure at the prime site. These arrangements are tested regularly.

The US dollar embedded payment arrangements operate on a highly decentralised basis. There have been very few instances (and they have involved small bilateral net payments) of the end-of-day settlement not completing on the day because of operational difficulties.

The Bank assesses CREST's payment arrangements to observe Core Principle VII.

VIII. The system should provide a means of making payments which is practical for its users and efficient for the economy.

CREST serves over 41,000 members who range from private clients (the vast majority) to banks and broker dealers, generating a mixture of low-, medium- and high-value payments. As mentioned under Core Principle III, 99% of trades by value (around 92% by volume) settle on their intended settlement date. The liquidity transfer mechanisms supporting the sterling and euro embedded payment arrangements appear practical, and the self-collateralising repo mechanism enables settlement banks to economise on the liquidity devoted to the sterling embedded payment arrangements. **The Bank assesses CREST's payment arrangements to observe Core Principle VIII**.

IX. The system should have objective and publicly disclosed criteria for participation, which permit fair and open access.

A prospective CREST settlement bank has to meet CRESTCo's participation criteria (which are also applied to other CREST participants or users). These criteria are both objective and publicly disclosed (in the *CREST Rules* and *Terms and Conditions*). The *CREST Manual* also describes the functions which a CREST settlement bank is required to perform. However, the Bank and the existing CREST settlement banks have a right to determine whether a prospective participant should be admitted as a CREST settlement bank. This right is represented in an *Agreement of Adherence* that CRESTCo, the Bank, the existing settlement banks and any prospective participant have to agree and sign. The Bank published its policy on the provision of CREST settlement accounts in November 2002.[2] In 2003 it became possible to become a member of the sterling and/or euro embedded payment arrangements without also being a member of CHAPS. There are, however, no participation criteria publicly disclosed by the CREST settlement bank community. There are objective reasons to have credit quality requirements for banks wishing to join the US dollar embedded payment arrangements, given that the latter still generate intraday exposures, but these should be disclosed. While CRESTCo's criteria for participation are objective and publicly disclosed, the Bank does not see any objective justification for existing settlement members' having a theoretical veto over other banks' seeking to become CREST sterling or CREST euro settlement banks. (There may have been some justification for more restrictive, credit-risk orientated criteria for the sterling and euro embedded arrangements before November 2001, when members ran considerable intraday exposures as part of the then end-of-day multilateral net settlement process.) **The Bank assesses the embedded payment arrangements partly to observe Core Principle IX**.

X. The system's governance arrangements should be effective, accountable and transparent.

As mentioned under Core Principle I, the provision of sterling and euro embedded payment services is governed by a variety of contracts between CRESTCo, the Bank and the individual members of the embedded payment systems. These detail which elements of the sterling and euro payment arrangements each party is responsible for, and are supported by external audit, with both RTGS and CREST subject to SAS 70 reporting. There are a

2: Bank of England (2002) *Bank of England Settlement Accounts*, available at: www.bankofengland.co.uk/financialstability/paymentsystems/boesettleaccs021128.pdf.

variety of fora at which the interests of the various parties to these contracts, and of the wider CREST community, can be represented. These include the UK Market Advisory Committee: a consultative body set up as part of the Euroclear group's policy to ensure a high degree of user-governance in the various national markets where Euroclear provides settlement services. The settlement banks, CRESTCo and the Bank also have meetings co-ordinated by the Association for Payment Clearing Services (APACS) to discuss operational and business issues related to the embedded payment systems. While these various arrangements appear effective individually, the collaborative nature of the embedded payment arrangements supporting CREST settlement means that there is no over-arching governance framework in place. Consequently, **the Bank assesses the payment arrangements partly to observe Core Principle X**. Notwithstanding this assessment, the governance arrangements of CREST as a system have a number of desirable features, in particular the involvement of independent Board directors within the Euroclear corporate structure. These help in maintaining accountability of the CRESTCo executive and help ensure that wider public interest objectives are considered.

Implications of the Euroclear business plan and corporate restructuring.

The Euroclear business plan (described in Chapters 3 and 4 of this *Report*) will, when delivered, have an impact on how the sterling and euro embedded payment arrangements will operate and will therefore require their reassessment against certain Core Principles. In particular, the adoption of a fully outsourced model for central bank money settlement would require compliance with Core Principles III, IV, VI and VIII (the latter in respect of the liquidity management arrangements) to be reassessed; and Euroclear's major data centre reorganisation raises important issues of operational resilience and security (Core Principle VII). Finally, the corporate restructuring itself presents securities regulators and payment system overseers of the Euroclear group countries with a number of challenges in terms of effective co-operative regulation and oversight of the group and its various operating entities (see Chapter 4). Regulators and overseers are close to signing an MoU establishing a framework for co-operation between themselves.

C. LCH.CLEARNET LTD

LCH.Clearnet Ltd operates a payment mechanism to effect transfers of funds to and from its members in the currencies in which it incurs exposures. This is known as the Protected Payments System (PPS). The PPS consists of a network of commercial banks, which provide a settlement bank service to LCH.Clearnet Ltd and its members, processing payment transfers between them. LCH.Clearnet Ltd holds an account at each PPS bank and each member must have an account at a PPS bank. The PPS is the mechanism by which LCH.Clearnet Ltd discharges obligations relating to cash-settled transactions, collects initial margin and transfers variation margin.[1] In each currency, one of the PPS banks acts as a 'concentration bank' for LCH.Clearnet Ltd: the net amounts due from members in that currency are gathered on LCH.Clearnet Ltd's account at the concentration bank and the surplus is invested in the money market. A second PPS operates in the United States, which is used to collect intraday margin calls made late in the day after the UK payment systems have closed.

I. The system should have a well-founded legal basis under all relevant jurisdictions.

The arrangements for transfer of payments between LCH.Clearnet Ltd and its members through the PPS are governed by English law. The PPS is covered by LCH.Clearnet Ltd's designation under the regulations implementing the EU *Settlement Finality Directive* in the United Kingdom (the 'UK settlement finality regulations'). Under these regulations, payment transfer orders through the PPS are protected from the potentially disruptive effects of insolvency proceedings against participants in the system. Separate *Settlement Finality Regulations* form part of LCH.Clearnet Ltd's *General Regulations, Default Rules and Procedures*. PPS banks that are not members of LCH.Clearnet Ltd are also signatories to the same *Settlement Finality Regulations*. In addition, LCH.Clearnet Ltd has obtained legal opinions to confirm that members who are not resident in the United Kingdom are able to commit to governance of their relationship with LCH.Clearnet Ltd under English law. **The Bank assesses the PPS in the United Kingdom to observe Core Principle I**.

II. The system's rules and procedures should enable participants to have a clear understanding of the system's impact on each of the financial risks they incur through participation in it.

The participants in the PPS comprise LCH.Clearnet Ltd, its members and the PPS banks. LCH.Clearnet Ltd's *General Regulations, Default Rules and Procedures* contain a section (*Settlement Finality Regulations*) setting out how the PPS operates and the obligations of the various parties. The *Settlement Finality Regulations* also define when payment transfers are considered to have entered into the system, and the point at which they become irrevocable.

Members of LCH.Clearnet Ltd are required to sign a PPS mandate, which grants permission for the PPS bank to debit the member's account according to instructions received from LCH.Clearnet Ltd. This mandate states the actions the PPS banks are able to take without seeking further authority from the member. Members are able to choose which PPS bank to use for a particular currency according to their understanding of the risks, costs and benefits involved.

PPS banks sign a *PPS Agreement* with LCH.Clearnet Ltd, which explains the obligations of each PPS bank in the system. LCH.Clearnet Ltd is considering the introduction of a more detailed document, however, which will resemble a set of 'business requirements'. The agreement of this document would improve the transparency for PPS banks of the financial risks they incur in the PPS. **The Bank assesses the PPS broadly to observe Core Principle II**.

1: 'Initial margin' is a returnable deposit required from a member for each open position, designed to offset the costs to LCH.Clearnet Ltd of settling open positions in the event of member default. 'Variation margin' is funds paid by (or received by) members to (or from) LCH.Clearnet Ltd to settle any losses (or gains) resulting from marking open positions to market.

III. The system should have clearly defined procedures for the management of credit risks and liquidity risks, which specify the respective responsibilities of the system operator and the participants and which provide appropriate incentives to manage and contain those risks.

The nature of a central counterparty is that rather than bilateral credit and liquidity exposures between members, credit exposures are between members and LCH.Clearnet Ltd as the central counterparty. Since payments to and from LCH.Clearnet Ltd are made through the PPS banks, credit and liquidity exposures can also arise between a PPS bank and members, and between LCH.Clearnet Ltd and the PPS banks. However, because all the exposures are bilateral, the failure to pay by one of the PPS banks or by an individual LCH.Clearnet Ltd member would not disrupt the PPS arrangements more broadly, unless the amounts were enough to affect LCH.Clearnet Ltd's ability to meet its own obligations in a timely manner. The failure of the 'concentration bank' in any currency would be likely to cause more severe disruption to LCH.Clearnet Ltd, since the net funds held by LCH.Clearnet Ltd are gathered on an account at this bank before they are invested in the money market.

There is currently no formal structure of incentives to ensure PPS banks make payments to the concentration bank promptly after they are requested by LCH.Clearnet Ltd. Although these amounts are already held in the name of LCH.Clearnet Ltd on accounts at the PPS banks, the transfer of funds to the concentration bank allows LCH.Clearnet Ltd to offset the outgoing payments resulting from other obligations and to invest excess funds in the money market. Hence, if PPS banks made these transfers earlier in the day, the credit and liquidity pressures on LCH.Clearnet Ltd would be reduced, and it would be able to reduce its need for an intraday overdraft at the concentration bank. LCH.Clearnet Ltd would benefit from the introduction of formalised arrangements with the PPS banks to encourage prompt transfer of funds to the concentration bank and should regularly monitor the PPS banks' compliance with this requirement. The 'business requirements' document mentioned under Core Principle II should address this issue by introducing a deadline for the concentration bank transfers. Until this is resolved, **the Bank assesses the PPS partly to observe Core Principle III**.

IV. The system should provide prompt final settlement on the day of value, preferably during the day and at a minimum at the end of the day.

PPS banks are required by 09.00 UK time on the day of receipt of the payment instruction to confirm to LCH.Clearnet Ltd that they will meet the required payments on behalf of the clearing members. At this point, the PPS banks have made an irrevocable commitment to pay the amount owed to LCH.Clearnet Ltd. However, final settlement of these transfers between the members and LCH.Clearnet Ltd takes place when the relevant individual debit and credit entries are made across the accounts of the PPS banks. In some currencies this will not take place until the following day, which will be the next value date for that currency.

In sterling and euro, the net amount due between LCH.Clearnet Ltd and the relevant PPS bank is then transferred between accounts in the name of LCH.Clearnet Ltd at the PPS bank and at HSBC, which acts as concentration bank for LCH.Clearnet Ltd in those currencies. These latter transfers are made via CHAPS and thus are settled with intraday finality. As noted above, prompt payment of these amounts by the PPS banks reduces the intraday risk to LCH.Clearnet Ltd and should be encouraged.

US dollar transfers take place in both the UK and the US PPS systems. The arrangements for US dollar transfers in the UK PPS system are the same as those for sterling and euro, except that the transfers to and from the concentration bank (Citibank in this case) take place across *nostro* accounts, rather than via CHAPS. The US PPS system is used for intraday calls after 16.00 UK time. Again, PPS banks are required to confirm their commitment to pay LCH.Clearnet Ltd. Concentration bank transfers are made via Fedwire, which is a US RTGS system, so these concentration payments are also final on the same day.

While sterling, euro, US dollar and Canadian dollar transactions are processed with same-day value in the PPS, for Australian dollar, Swiss franc, Danish krone, Hong Kong dollar, Japanese yen, Norwegian krone, New Zealand dollar and Swedish krona transactions, the nostro arrangements in place only allow for final settlement on the day after the payment instructions are sent. However, as LCH.Clearnet Ltd makes calls in these currencies for next day value, final settlement still occurs on the day of value. In addition, LCH.Clearnet Ltd receives an irrevocable commitment on the same day as instructions are sent out, and the amounts transferred in these currencies are currently small relative to those processed with same-day value, representing about 5% (£86 million on average per day) of the total amount transferred on average through the PPS. For some of the above currencies, time-zone constraints will prevent same-day finality. **The Bank assesses the PPS to observe Core Principle IV**.

V. A system in which multilateral netting takes place should, at a minimum, be capable of ensuring the timely completion of daily settlements in the event of an inability to settle by the participant with the largest single settlement obligation.

There is no multilateral netting of payments in the PPS. This Core Principle is not applicable to the PPS.

VI. Assets used for settlement should preferably be a claim on the central bank; where other assets are used, they should carry little or no credit risk and little or no liquidity risk.

The first stage of the two-leg transfer of funds from members to LCH.Clearnet Ltd occurs via a book-entry transfer in commercial bank money on the books of the PPS banks. This transfer occurs if the member has sufficient funds on its account, or has in place credit lines with its PPS bank sufficient to allow the payment to take place. The credit risk at this stage for LCH.Clearnet Ltd is on the PPS banks, while for the PPS banks there may be a credit exposure to the members for which they provide PPS services. Credit risks also occur in the opposite direction when LCH.Clearnet Ltd is due to make payments to members. PPS banks must have a minimum long-term rating of A-minus by Fitch Ratings or the equivalent by Moody's or Standard & Poor's.

The concentration process in sterling and euro occurs by transfers from the other PPS banks to HSBC across settlement accounts at the Bank of England via CHAPS. Not all of the PPS banks are direct members of CHAPS, which results in the possibility of credit or liquidity risks between the indirect members and the CHAPS banks that process their payments. However, there is no evidence that those PPS banks that do not have direct access to CHAPS experience delays in making transfers to the concentration bank.

In the remaining currencies, the concentration bank transfers are made across *nostro* accounts at commercial banks. The amounts transferred in these currencies are small, with the exception of transfers in US dollars in the UK PPS system. These amounts, though small by comparison with other UK payment systems are, on average, the largest made through the PPS system. It would therefore be beneficial to the overall risk in the PPS if LCH.Clearnet Ltd were able to establish an arrangement in US dollars so that funds were held in the form of central bank account balances free of credit risk.

The net amount transferred between LCH.Clearnet Ltd and its members is gathered on to an account in the name of LCH.Clearnet Ltd at the concentration bank. Currently, that bank is HSBC for sterling and euro and Citibank for US dollars. All transfers of funds to and from LCH.Clearnet Ltd and its members, as well as the transfers resulting from LCH.Clearnet Ltd's investment of cash in the money markets, pass across these accounts. So the concentration bank plays a key role in the PPS arrangements. It is intended that the Bank of England will take on this role for sterling and euro in the PPS in future. This will remove any risk of a failure of the concentration bank. As with the mechanism for the concentration process in sterling and euro, risks in the PPS would be further reduced if it were possible to find a means to remove the equivalent risk in US dollars. **The Bank assesses the PPS broadly to observe Core Principle VI for transfers in sterling and euro and partly to observe Core Principle VI for transfers in US dollars**.

VII. The system should ensure a high degree of security and operational reliability and should have contingency arrangements for timely completion of daily processing.

The PPS arrangements rely on SWIFT and the CHAPS system, as well as on the operational reliability of the individual PPS banks, the concentration banks and LCH.Clearnet Ltd's Treasury Operations department. LCH.Clearnet Ltd has an alternative data centre, so that primary facilities do not represent a potential single point of failure in the event of a major disruption. The exact recovery times for processing to switch to the secondary data centre would depend on the nature of the disruption, but plans allow for recovery of 'business critical' functions (including treasury operations) within two hours. In the event of a SWIFT outage, LCH.Clearnet Ltd would communicate with the PPS banks by fax. SWIFT and CHAPS have taken measures to ensure continuity of core services, as noted elsewhere in this *Report*. In addition, LCH.Clearnet Ltd can make calls in the PPS system in the United States, which uses the Fedwire system.

The operational reliability and resilience of the systems used across the LCH.Clearnet Group is important for the functioning of the PPS. The PPS itself is an arrangement to transfer amounts owing between LCH.Clearnet Ltd and its members, but the calculation of these amounts is undertaken in other systems within LCH.Clearnet Ltd. These systems are also part of the 'business critical' functions under the business continuity plans mentioned above. **The Bank assesses the PPS to observe Core Principle VII**.

VIII. The system should provide a means of making payments which is practical for its users and efficient for the economy.

Each LCH.Clearnet Ltd member is required to hold an account in each currency in which it incurs settlement obligations. There are currently 14 banks in the UK PPS arrangements, and a further 12 in the US PPS. Although not all the UK PPS banks provide accounts in all currencies, there is ample competition between PPS banks to ensure that members receive an adequate level of service and costs. **The Bank assesses the PPS to observe Core Principle VIII**.

IX. The system should have objective and publicly disclosed criteria for participation, which permit fair and open access.

All members of LCH.Clearnet Ltd are required to hold an account with at least one PPS bank. This requirement to participate forms part of the *General Regulations* of LCH.Clearnet Ltd, which are publicly disclosed. Members sign an LCH.Clearnet Ltd standard account mandate at the opening of an account, but all other aspects of the arrangement between the PPS banks and the members for whom they provide PPS services are part of a general banking relationship. Members are free to choose which PPS bank to use and may use a different bank for each currency.

Banks that approach LCH.Clearnet Ltd to become a PPS bank receive information on the requirements. There are 26 banks currently providing a PPS service in the United Kingdom and United States. However, there are currently no publicly available criteria for the selection of PPS banks, beyond a requirement for a minimum credit rating. As mentioned above, LCH.Clearnet Ltd is considering the introduction of a more detailed set of criteria for PPS banks, which would meet the requirement for fair and open access. These criteria, once developed, should also be made available to interested parties on request. **The Bank assesses the PPS broadly to observe Core Principle IX.**

X. The system's governance arrangements should be effective, accountable and transparent.

Since the PPS is the embedded payment arrangement that serves the LCH.Clearnet Ltd system as a whole, it does not have clearly distinct governance arrangements. However, LCH.Clearnet Ltd is subject to regulation by the FSA and its governance arrangements include the presence of independent non-executive directors (both on the Board of LCH.Clearnet Ltd and its parent), as well as User Consultative Committees to take account of members' interests. In addition, LCH.Clearnet Ltd holds a meeting with the group of PPS banks in the United Kingdom four times a year and annually in the United States. The Bank has not identified any weaknesses in the effectiveness, accountability or transparency of the governance arrangements for the PPS. **The Bank assesses the PPS to observe Core Principle X**.

Implications of the merger of LCH and Clearnet. This assessment focuses on the embedded payment arrangements in LCH.Clearnet Ltd, which are not directly affected by the merger of LCH and Clearnet. However, it is possible that new payment arrangements could be proposed as part of the implementation of the merger. If this were to happen, or if there were changes to other systems in the LCH.Clearnet Group affecting the PPS, the Bank would wish to assess the new arrangements against these Core Principles. The LCH.Clearnet Group management have recognised that the programme of IT projects necessary to integrate and update the full set of IT systems across the LCH.Clearnet Group represents a significant operational risk challenge.

The merger also creates a responsibility for the Bank, as overseer of the embedded payment arrangement, to co-operate with other central banks and foreign authorities in promoting the safety and efficiency of LCH.Clearnet Group. To this end, the authorities involved in the supervision and oversight of the two central counterparties have agreed an MoU, which sets out a mechanism for information sharing, co-operation and co-ordination in discharging their responsibilities.

D. BACS

The BACS payment system provides processing of bulk electronic payments (Direct Debits, Direct Credits and standing orders) and is owned by BACS Payment Schemes Ltd (BPSL).[1]

I. The system should have a well-founded legal basis under all relevant jurisdictions.

One area of law that has direct relevance for payment systems is that governing the insolvency of a member. Under certain circumstances, it is possible that the system's arrangements for dealing with the insolvency of a member – in particular the netting of payments to and from each member – could be subject to legal challenge. In June 2003, members of BACS therefore signed formal contracts (the *Settlement Agreement*) governing the settlement of inter-member obligations, which aimed to remove legal uncertainties concerning whether the netting arrangements would be upheld following the insolvency of a member. As with the C&CC, additional assurance of the enforceability of the system's default arrangements could be obtained if BACS were designated under the *Financial Markets and Insolvency (Settlement Finality) Regulations* (1999), which implemented the EU *Settlement Finality Directive* (1998) in the United Kingdom. Members are currently considering whether to apply for designation.

The Bank assesses BACS broadly to observe Core Principle I. A successful application for designation under the UK settlement finality regulations would strengthen observance.

II. The system's rules and procedures should enable participants to have a clear understanding of the system's impact on each of the financial risks they incur through participation in it.

Through work on the *Settlement Agreements* and work in progress on the *Liquidity Funding and Collateralisation Agreement* (see also Core Principle V), members have examined, clarified and reduced the financial risks related to the settlement of multilateral net positions. **The Bank assesses BACS to observe Core Principle II.**

III. The system should have clearly defined procedures for the management of credit risks and liquidity risks, which specify the respective responsibilities of the system operator and the participants and which provide appropriate incentives to manage and contain those risks.

The basic obligation to settle net amounts is clear and, following the implementation of the *Settlement Agreement*, should be enforceable. Although there is currently no agreed procedure for managing the credit and liquidity risks that would arise in the event of a failure to settle, the proposed *Liquidity Funding and Collateralisation Agreement* (see Core Principle V), which members aim to have ready for signature by the end of the first quarter of 2005, should address this. The completion of work on debit caps and 'regression' (the removal of payments involving a failed member input on the day of default but for value two days later) are other elements which would contribute to managing and containing credit risks (Box 5).

BACS does not currently observe Core Principle III. Completion of a number of the work strands described above could help bring BACS into full observance.

IV. The system should provide prompt final settlement on the day of value, preferably during the day and at a minimum at the end of the day.

Although the point of finality of interbank settlement is not specified in the BACS rules, it seems likely that settlement would be considered final once postings of net positions had been made to members' settlement accounts at the Bank of England (on day 3 of the interbank clearing cycle), which is when settlement members receive value.

Since there are no agreed procedures for ensuring timely settlement in the event of the failure of a settlement member in a net debit position to make its pay-in, there is a risk that final settlement might not take place until after day 3. Under normal circumstances, however, final settlement occurs on the day of value, so this risk is not sufficient to prevent BACS from observing this

1: The 14 members of BPSL outsource the provision of core processing services to a single third-party – Voca (formerly BACS Ltd) – which provides the central infrastructure for BACS.

Core Principle. **The Bank therefore assesses BACS to observe Core Principle IV.**

V. A system in which multilateral netting takes place should, at a minimum, be capable of ensuring the timely completion of daily settlements in the event of an inability to settle by the participant with the largest single settlement obligation.

BACS has no procedures to ensure timely settlement in the event of the default of a settlement member in a net debit position. Members are currently working to agree a *Liquidity Funding and Collateralisation Agreement* covering BACS, as well as the C&CC, that would establish such procedures (see Chapter 3).

In the event of a failure to pay, collateral pledged by the defaulter would be available to reimburse surviving members. They would be obliged collectively to provide liquidity to cover the failed member's position up to a limit set at the largest aggregate open debit position of any member in all the clearings covered by the Agreement in the previous twelve months. Since neither BACS nor the C&CC has the ability to cap exposures at this level, a small risk would remain that a member could default on a larger amount than surviving members would be committed to provide.

The Bank assesses BACS not to observe Core Principle V. The implementation of the *Liquidity Funding and Collateralisation Agreement* would bring it into broad observance.

VI. Assets used for settlement should preferably be a claim on the central bank; where other assets are used, they should carry little or no credit risk and little or no liquidity risk.

Settlement between members takes place across accounts held at the Bank of England. **The Bank assesses BACS to observe Core Principle VI**.

VII. The system should ensure a high degree of security and operational reliability and should have contingency arrangements for timely completion of daily processing.

The systems and controls set out by BPSL for controlling operational risk are wide ranging and are generally well documented. Policies and procedures, which are reviewed regularly, have been put in place to identify and address potential weaknesses. Contingency arrangements for both BPSL and members' processing provider, Voca, are in place and appear extensive. BPSL plans to investigate further ways in which these arrangements could be clarified or strengthened to deal with potential weaknesses when handling a backlog of payments, in the unlikely event that contingency arrangements prove inadequate and processing has to be delayed for 24 hours or more.

BPSL has little centralised infrastructure: members are responsible for their own processing arrangements. All BPSL members have established contracts with a single third party (Voca) for the provision of core processing services. Service Level Agreements (SLAs) setting out the responsibilities of the supplier are in place. Notwithstanding occasional delays and errors, details of which are reported to BPSL and its members, the overall record of reliability is high. The key SLAs for delivering 'output' to members were missed on three occasions in the twelve months ending October 2004.

Voca's infrastructure renewal programme offers potential benefits for members and their customers in terms of security and functionality. It is, however, a major IT project requiring careful management of the risks which such projects entail. In the meantime, it must be the highest priority of BPSL, its members and Voca to ensure the continuing reliability, resilience and integrity of core payment services through every stage of the project, given the importance of BACS payments to the wider economy.

The Bank assesses BACS broadly to observe Core Principle VII.

VIII. The system should provide a means of making payments which is practical for its users and efficient for the economy.

The use of Direct Debits and Direct Credits has increased significantly in recent years, indicating that these payment instruments, provided by BPSL, offer members a practical and efficient means of making their customers' payments.

It is not straightforward to assess the efficiency of a payment system. It is possible, however, that a system that takes undue time to clear and settle payments may cause end-users to incur certain costs, such that the system's design may not be optimal for the economy as a whole. There is no 'float' cost for end-users when debits to customers' accounts are made simultaneously with the corresponding credits. This is the case for Direct Debits and the majority of Direct Credits. However, there may be other disadvantages of a slow cycle (for example, if goods are not released until payment is received). Although improvements to the central infrastructure have facilitated increased automation of Direct Debits, the three-day clearing cycle appears slow in comparison with similar systems in other developed countries. On completion, Voca's infrastructure renewal programme is expected to deliver central processing technology that has most of the features required to support faster clearing cycles (development would also be necessary within member banks' systems to support shorter end-to-end clearing). Under the aegis of the OFT Payment Systems Task Force, the level of demand for faster clearing of retail payments and the potential benefits this may bring to the economy are being investigated. BPSL is participating in the OFT Payment Systems Task Force. Though BACS is not the only way of satisfying potential demand (CHAPS already offers same-day payments), BPSL and its members will consider the potential costs and benefits of a shorter clearing cycle. These include potential benefits for BPSL member banks in terms of reduced settlement risk (Box 5).

While BACS provides a popular means of making a large number of payments, until work to assess potential benefits of a faster clearing cycle is complete **there is insufficient evidence for the Bank to assess whether BACS observes Core Principle VIII**. The Bank intends to consider further the outcome of the OFT's and members' work in this area during 2005.

IX. The system should have objective and publicly disclosed criteria for participation, which permit fair and open access.

BPSL restricts settlement membership to credit institutions subject to prudential capital and liquidity regulation, thereby limiting the risk that the multilateral settlement could fail to complete due to a settlement member's failure to meet its settlement obligations in a timely manner. The Bank considers this a prudent step in order to avoid the disruption to the wider economy and public that a failure to settle, and consequent interruption to BACS processing, could cause.

This does not, however, preclude extending some of the benefits of BACS membership – including representation on the BPSL Board and access to the wholesale payment tariff – to institutions that do not currently meet the criteria for settlement membership. Recent work by BPSL suggests that it may be feasible to create a new class of 'clearing members', embracing a wider range of institutions, including non-financial firms, which would have access to some membership benefits, but would not be directly responsible for the multilateral settlement. This is currently being discussed in the OFT Payment Systems Task Force, and the Bank considers that, potentially, it could satisfy the Core Principle IX requirement for fair and open access. Pending adoption of this model, **the Bank assesses BACS partly to observe Core Principle IX**.

X. The system's governance arrangements should be effective, accountable and transparent.

BPSL has a clear governance structure, with ultimate responsibility for management of the system resting with the Board. The Bank considers the BPSL Board to exercise effective control over the company's executive. In turn, BPSL and its members have established clear contractual arrangements for the supply of infrastructure services by Voca. The arrangements provide a structure through which objectives and performance targets can be set and monitored. Effective operation of this governance structure is crucial to meet the considerable practical challenge of governing the major NewBACS infrastructure renewal project. There is an ongoing need for transparency and appropriate scrutiny – independent of the infrastructure provider – of all phases of this important project.

The Core Principles state that effective governance provides proper incentives for management to pursue objectives in the interests of the system, its participants, and the public more generally. The BPSL Board is composed of one director appointed from each of the settlement members, and BPSL's Managing Director. The CEO of APACS is also entitled to attend the Board. The Board has both the incentives and tools to pursue the interests of the system and its settlement members. Incentives to pursue the interests of the public more generally are less clear. The Bank appoints one of the twelve member-appointed directors, which to some degree helps ensure the public interest is represented. In light of the important role BACS plays in the smooth functioning of the economy, however, there may be a case for considering independent or further public interest representation on the BPSL Board.

One indication of the strength of a payment system's governance arrangements is the level of compliance with other appropriate Core Principles. In the case of BACS, work is in hand that would strengthen compliance with many of the Core Principles where it is not already compliant. In some cases, this work has taken a significant amount of time to progress to a satisfactory conclusion. This may reflect the possible weaknesses of a governance model that requires consensus among members on significant changes. These issues are discussed further in Chapter 4.

The Bank assesses BACS broadly to observe Core Principle X.

E. CHEQUE AND CREDIT CLEARINGS

The Cheque and Credit Clearings (C&CC) consist of three separate clearings, which provide clearing and settlement for sterling debits (cheques); euro debits; and sterling credits respectively. While these instruments are processed separately and in slightly different ways (in particular, the degree of automation of processing is much higher for the majority of sterling cheques than for other payment instruments) they are part of a single payment scheme. The following assessment covers all three clearings. Where the Bank assesses observance with the Core Principles to vary between the different clearings, this is identified.

I. The system should have a well-founded legal basis under all relevant jurisdictions.

Unlike other payment instruments, there is a substantial body of English law pertaining to cheques. One of the most important statutes for the operation of the C&CC is the *Bills of Exchange Act* (1882), which *inter alia* required 'presentment' by the payee (or his bank acting on his behalf) of a cheque or other bill of exchange at the branch on which it was drawn to obtain payment; and the later amendments in the *Deregulation (Bills of Exchange) Order* (1996), which made electronic presentment of cheques sufficient to obtain payment.

Under certain circumstances, it is possible that the system's arrangements for dealing with the insolvency of a member – in particular the netting of payments to and from each member – could be subject to legal challenge. In June 2003, members of the clearings signed formal contracts – the *Settlement Agreements* – governing the settlement of inter-member obligations. These aim to remove legal uncertainties about whether the netting arrangements would be upheld following the insolvency of a member. Additional assurance of the enforceability of the system's default arrangements could be obtained if the C&CC were designated under the *Financial Markets and Insolvency (Settlement Finality) Regulations* (1999), which implemented the EU *Settlement Finality Directive* (1998) in the United Kingdom; it is not currently designated.

The rules and procedures of the C&CC cover the main aspects of the system's operations and seem to provide an adequate basis for its operation. Notwithstanding the *Settlement Agreement* signed in 2003, there is currently a possibility that a liquidator could seek to return all cheques drawn on a failed member and its customers. This could cause difficulties for members in handling a large volume of unpaid cheques, and impose exposures on surviving members in respect of dishonoured cheques already credited to their customers' accounts. Members are currently working to agree a *Cheque and Debit Recall Agreement* that would aim to prevent this. The Company expects this Agreement to be implemented shortly after the *Liquidity Funding and Collateralisation Agreement*, which is expected to be ready for signature by the end of the first quarter of 2005 (see Core Principle V).

One further concern is that members do not sign formal contracts committing them to abide by the rules and decisions of the company Board. It is possible that a court would conclude that members had implicitly agreed to abide by the rules of the system by conduct. But this risk is likely to be mitigated as it is aimed to agree such a contract in March 2005.

The Bank assesses the C&CC partly to observe Core Principle I, but completion of work already under way on the *Cheque and Debit Recall Agreement* and implementation of a formal membership agreement should strengthen observance with the Core Principle.

II. The system's rules and procedures should enable participants to have a clear understanding of the system's impact on each of the financial risks they incur through participation in it.

Through work on the *Settlement Agreement* and work in progress on the *Liquidity Funding and Collateralisation Agreement* (see also Core Principle V), members have examined, clarified and reduced the financial risks related to the settlement of multilateral net positions. Work is in hand to implement a 'high-value adjustment' process to mitigate the risk caused by significant errors in settlement figures. This latter process should be live by the end of the first quarter of 2005. The work on the *Cheque and Debit Recall Agreement* described under Core Principle I is a further strand of the programme to mitigate a risk that has been identified and made clear to members. **The Bank assesses the C&CC to observe Core Principle II**.

III. The system should have clearly defined procedures for the management of credit risks and liquidity risks, which specify the respective responsibilities of the system operator and the participants and which provide appropriate incentives to manage and contain those risks.

The basic obligation to settle net amounts is clear and, following the implementation of the *Settlement Agreement*, should be enforceable. But there are currently no agreed procedures for managing the credit and liquidity risks that would arise from a failure to settle. The proposed *Liquidity Funding and Collateralisation Agreement* should address this (see Core Principle V). The completion of work on immediate adjustments, default procedures and the *Cheque and Debit Recall Agreement* are the other elements that will establish clear procedures, responsibilities and appropriate incentives. Pending the completion of this work, **the Bank assesses the C&CC not to observe Core Principle III**.

IV. The system should provide prompt final settlement on the day of value, preferably during the day and at a minimum at the end of the day.

Although the point of finality of interbank settlement is not specified in the C&CC rules, it seems likely that settlement would be considered final once postings of net positions had been made to members' settlement accounts at the Bank of England (on day 3 of the interbank clearing cycle), which is when settlement members receive value.

Since there are no agreed procedures for ensuring timely settlement in the event of the failure of a settlement member in a net debit position to make its pay-in, there is a risk that final settlement might not take place until after day 3. Under normal circumstances, however, final settlement occurs on the day of value, so this risk is not sufficient to prevent the C&CC from observing this Core Principle. **The Bank therefore assesses the C&CC to observe Core Principle IV**.

V. A system in which multilateral netting takes place should, at a minimum, be capable of ensuring the timely completion of daily settlements in the event of an inability to settle by the participant with the largest single settlement obligation.

There are no procedures to ensure timely settlement if a settlement member fails in a net debit position. However, members are currently working to agree a *Liquidity Funding and Collateralisation Agreement* covering the C&CC, as well as BACS, that would establish such procedures (see Chapter 3). Members of the scheme aim to have an Agreement ready for signature by the end of the first quarter of 2005. The Company is also working on the procedures to be followed in the event a member fails.

If the current draft of the Agreement is implemented, collateral pledged by the defaulter would, in the event of a failure to pay, be available to reimburse surviving members. Survivors would be obliged collectively to provide liquidity to cover the failed member's position up to a limit set at the largest aggregate open debit position of any member in all the clearings covered by the Agreement in the previous twelve months. Since neither BACS nor the C&CC has the ability to cap exposures at this level, a small risk would remain that a member could default on a larger amount than surviving members would be committed to provide (the Bank recognises that there may be significant practical obstacles to capping members' multilateral net positions in a paper-based system). At present **the Bank assesses the C&CC not to observe Core Principle V**, but implementation of the *Liquidity Funding and Collateralisation Agreement* could bring the C&CC into broad observance.

VI. Assets used for settlement should preferably be a claim on the central bank; where other assets are used, they should carry little or no credit risk and little or no liquidity risk.

Settlement between members of the payment system takes place across accounts held at the Bank of England. **The Bank assesses the C&CC to observe Core Principle VI**.

VII. The system should ensure a high degree of security and operational reliability and should have contingency arrangements for timely completion of daily processing.

The systems and controls set out by the Cheque and Credit Clearing Company (C&CCC) for controlling operational risk are wide-ranging and are generally well documented. Policies and procedures, which are reviewed regularly, are in place to identify and address potential weaknesses. Contingency arrangements appear to be extensive, with the exception of two potential shortcomings that are being addressed.

Unlike some payment systems, there is relatively little central infrastructure in the C&CC: members are responsible for processing their own cheques, and the majority of members outsource this to one of three service providers. These outsourcing relationships are governed by bilateral contracts between the member and the service provider. There is no direct formal relationship between the processing providers and the C&CCC (although the Company has established an Infrastructure Advisory Forum so that the Company, members and suppliers have a forum in which to discuss relevant issues). The C&CCC has looked at ways of strengthening the assurance of compliance with the various controls that govern cheque processing. Members should continue to consider whether the existing level of assurance is sufficient. Another possible source of operational risk is the high volume of changes to members' processing arrangements which are currently in progress. **The Bank therefore assesses the C&CC broadly to observe Core Principle VII**.

VIII. The system should provide a means of making payments which is practical for its users and efficient for the economy.

Cheques remain a popular payment instrument in the United Kingdom, and the C&CCC offers its members and their customers a generally reliable service. Unit processing costs are, however, relatively high in comparison with other payment instruments and are predicted to rise further as the number of cheques processed declines.

Unlike in other developed countries where cheques have traditionally been a common payment instrument, the C&CCC and its members have not chosen to seek the potential product enhancements and cost savings that could be derived from replacing the current exchange of physical cheques with electronic data (for example, electronic images of cheques), although there is on-going consolidation of the infrastructure used for processing cheques.

It is not straightforward to assess the efficiency of a payment system. It is possible, however, that a system that takes undue time to clear and settle payments may cause end-users to incur significant costs, such that the system's design may not be optimal for the economy as a whole (even if it seems optimal for the members of the system). The three-day interbank clearing cycle and the process for returning unpaid cheques is slow in comparison with other developed countries. The C&CCC and its members are, however, investigating ways of accelerating and improving the process for returning unpaid cheques.

The decline in volumes weakens the business case for investing in improvements to clearing cycles. The argument that costs are likely to exceed benefits may be particularly powerful for the non-automated parts of the cheque clearing (including paper credits and euro-denominated paper), where volumes and values processed are considerably lower than for sterling cheques.

For sterling cheques, the clearing process is, however, already highly automated. While this may reduce the additional benefits that might be gained from investment in the imaging technology introduced in other countries, it may make it easier to accelerate the cheque clearing cycle. Data on cheque settlement positions are already available almost a day in advance of settlement. The Bank has encouraged the C&CCC to investigate the costs and benefits of bringing forward the interbank settlement for cheques from day 3 to day 2 and to ensure that these are transparent and understood by all relevant stakeholders. The benefits would include reduced settlement risk for the banks (Box 5).

The OFT also intends to look at these clearing cycle issues further as part of its Payment Systems

Task Force. The Bank will consider the outcome of work in the Task Force and by C&CC members. Pending completion of that work, **there is insufficient evidence for the Bank to assess whether the C&CC observes Core Principle VIII**.

IX. The system should have objective and publicly disclosed criteria for participation, which permit fair and open access.

The criteria for settlement membership seem suitable for controlling the risks that arise in the system. In particular, the restriction of settlement membership to credit institutions subject to prudential capital and liquidity regulation provides some assurance that members can meet their settlement obligations in a timely manner, and so prevent the possible disruption to the wider system and public that a failure to settle could cause. One current gap in the membership criteria is a procedure to deal with a settlement member whose credit quality deteriorates to an extent that brings a high level of risk to the multilateral settlement. The Bank has encouraged the C&CCC to address this risk, and the C&CCC will be considering how best to do so.

The Bank is not aware of any significant demand for membership of the C&CC from institutions that are not already members. Financial institutions that are not members can access the system via bilateral agency relationships with settlement members. The Bank understands that there is a competitive market for agency services and that agency banks can compete on a reasonably level playing field with direct members. **The Bank assesses the C&CC broadly to observe Core Principle IX**.

X. The system's governance arrangements should be effective, accountable and transparent.

The C&CCC has a clear governance structure, with ultimate responsibility for management of the clearings resting with the Board. The Bank considers the Board to exercise effective control over the company's executive. The Core Principles state that effective governance entails proper incentives for management to pursue objectives in the interests of the system, its participants, and the public more generally. The Company Board is composed entirely of settlement member banks (the Company Manager and the CEO of APACS also attend but do not have a vote). The Board has both the incentives and tools to pursue the interests of the system and its settlement members. Incentives to pursue the interests of the public more generally are less clear. The Bank of England appoints one of the eleven member-appointed directors. There may be a case for the C&CCC to consider the case for independent or further public interest representation on the Board, though this is not as pressing a concern as for some of the more systemically important systems.

Another potential weakness in the system's governance arrangements is that there is no formal relationship between the C&CCC and the third-party service providers that process the majority of cheques. Members of the C&CC do, however, enter bilateral contracts with their service providers, and must certify annually that processing is conducted in accordance with the C&CCC's various risk controls. The assurance provided by these member self-certifications could be strengthened if the C&CCC exercised existing rights to audit members' service providers. These have not been exercised in the past. The C&CCC has agreed to consider such a move. **The Bank assesses the C&CC broadly to observe Core Principle X**.

Abbreviations

ACH	automated clearing house
APACS	Association for Payment Clearing Services
ATM	automated teller machine
BCBS	Basel Committee on Banking Supervision
BPSL	BACS Payment Schemes Ltd
BIS	Bank for International Settlements
C&CC	Cheque and Credit Clearings
C&CCC	Cheque and Credit Clearing Company Ltd
CCBM	Correspondent Central Banking Model
CCP	central counterparty
CHAPS	Clearing House Automated Payments System
CHAPSCo	CHAPS Clearing Company Ltd
CLS	Continuous Linked Settlement
CMA	Cash Memorandum Account
CMO	Central Moneymarkets Office
CPSS	Committee for Payment and Settlement Systems
CRESTCo	CREST Company Ltd
CSD	Central Securities Depository
DvP	Delivery versus Payment
ECB	European Central Bank
FSA	Financial Services Authority
FSAP	Financial Sector Assessment Programme
IMF	International Monetary Fund
IOSCO	International Organisation of Securities Commissions
I/O swap	inside/outside swap
MERLIN	Markets and Exchanges Regulatory Liaison and Information Network
MMI	money market instrument
MoU	memorandum of understanding
OECD	Organisation for Economic Co-operation and Development
OFT	Office of Fair Trading
OMO	open market operation
PPS	Protected Payments System
PvP	Payment versus Payment
RCH	Recognised Clearing House
RSSS	Recommendations for Securities Settlement Systems
RTGS	Real-Time Gross Settlement
SAS 70	Statement on Auditing Standards number 70
SLA	service level agreement
SWIFT	Society for Worldwide Interbank Financial Telecommunication
TARGET	Trans-European Automated Real-Time Gross Express Transfer System

Other Bank of England publications

Listed below are some of the main Bank publications. For a full list, please refer to the Bank's website: www.bankofengland.co.uk/publications.

Financial Stability Review

The *Financial Stability Review* is published twice a year, in June and December. Its purpose is to encourage informed debate on financial stability; survey potential risks to financial stability; and analyse ways to promote and maintain a stable financial system. The Bank intends this publication to be read by those who are responsible for, or have interest in, maintaining and promoting financial stability at a national or international level. It is of special interest to policymakers in the United Kingdom and abroad; international financial institutions; academics; journalists; market infrastructure providers; and financial market participants. It is available from: Financial Stability Review, Bank of England HO-3, Threadneedle Street, London, EC2R 8AH and on the Bank's website at: www.bankofengland.co.uk/fsr/index.htm.

Quarterly Bulletin

The *Quarterly Bulletin* provides regular commentary on market developments and UK monetary policy operations. It also contains research and analysis and reports on a wide range of topical economic and financial issues, both domestic and international. Back issues of the *Quarterly Bulletin* from 1981 are available for sale. Summary pages of the *Bulletin* from February 1994, giving a brief description of each of the articles, are available on the Bank's website at: www.bankofengland.co.uk/bulletin/index.html.

Inflation Report

The Bank's quarterly *Inflation Report* sets out the detailed economic analysis and inflation projections on which the Bank's Monetary Policy Committee bases its interest rate decisions, and presents an assessment of the prospects for UK inflation over the following two years.

The *Report* starts with an overview of economic developments; this is followed by six sections:

- analysis of money and asset prices;
- analysis of demand;
- analysis of output and supply;
- analysis of costs and prices;
- summary of monetary policy during the quarter; and
- assessment of the medium-term inflation prospects and risks.

The *Minutes* of the meetings of the Bank's Monetary Policy Committee (previously published as part of the *Inflation Report*) now appear as a separate publication on the same day as the *Report*.

Publication dates for the *Quarterly Bulletin* and *Inflation Report*

Copies of the *Quarterly Bulletin* and *Inflation Report* can be bought separately, or as a combined package for a discounted rate. Publication dates are as follows:

Quarterly Bulletin	
Spring 2005	14 March
Summer 2005	20 June
Autumn 2005	26 September
Winter 2005	12 December

Inflation Report	
February 2005	16 February
May 2005	11 May
August 2005	10 August
November 2005	16 November

These two publications are available from: Publications Group, Bank of England, Threadneedle Street, London, EC2R 8AH; telephone 020 7601 4030; fax 020 7601 3298; e-mail mapublications@bankofengland.co.uk.

General enquiries about the Bank of England should be made to 020 7601 4444. The Bank of England's website is at: www.bankofengland.co.uk.

Working papers

Working papers are free of charge; a complete list is available from the address below. An up-to-date list of working papers is also maintained on the Bank's website at: www.bankofengland.co.uk/wp/index.html, where abstracts of all papers may be found. Papers published since January 1997 are available in full, in pdf format.

External MPC Unit discussion papers

The MPC Unit discussion paper series reports on research carried out by, or under supervision of, the external members of the Monetary Policy Committee. Papers are available from the Bank's website at: www.bankofengland.co.uk/mpc/extmpcpaper0000n.pdf (where n refers to the paper number).

Monetary and Financial Statistics

Monetary and Financial Statistics (Bankstats) contains detailed information on money and lending, monetary and financial institutions' balance sheets, banks' income and expenditure, analyses of bank deposits and lending, external business of banks, public sector debt, money markets, issues of securities, financial derivatives, interest and exchange rates, explanatory notes to tables and occasional related articles.

From 2004 *Bankstats* continues to be published monthly on the Internet but paper copies are available on a twice-yearly basis. Paper copies will be published for the January and July editions in hard copy on Wednesday 2 February 2005 and Monday 1 August 2005 respectively. The price per annum in the United Kingdom is £40, or £20 per copy. *Bankstats* is available on a monthly basis free of charge from the Bank's website at: www.bankofengland.co.uk/mfsd/latest.htm.

Practical issues arising from the euro

This is a series of booklets providing a London perspective on the development of euro-denominated financial markets and the supporting financial infrastructure, and describing the planning and preparation for possible future UK entry. The most recent editions focused on the completion of the transition from the former national currencies to the euro in early 2002, and the lessons that may be drawn from it. Copies are available from: Public Enquiries Group, Bank of England, Threadneedle Street, London, EC2R 8AH and on the Bank's website at: www.bankofengland.co.uk/euro/piq.htm.

The Bank of England Quarterly Model

The *Bank of England Quarterly Model*, published in January 2005, contains details of the new macroeconomic model developed for use in preparing the Monetary Policy Committee's quarterly economic projections, together with a commentary on the motivation for the new model and the economic modelling approaches underlying it. The price of the book is £10.

Opportunities at the Bank of England Payment Systems: Oversight, Policy and Research

The Bank of England is at the heart of the UK financial system. And at the heart of the Bank of England are payment systems – the mechanism by which financial obligations are discharged between financial institutions, companies and households.

The Bank is currently seeking to recruit economists and analysts to support its work on payment system issues. This area is one of the Bank's key strategic priorities for coming years. The aim is to take the Bank to the frontier of international best practices on:

- the oversight of payment systems, domestic and international;
- the design of payment systems;
- research into payment systems theory and practice.

These issues are among the least explored of the core areas of central banking. They bridge both monetary theory and financial theory; and they span the space from day-to-day operational to longer-term theoretical issues. For the right individuals, they offer an opportunity to make their mark in a lasting way on public policy, not just in the UK but internationally.

If you are interested in exploring possibilities to work in this exciting area of the Bank, please contact, attaching a cv:

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International Conference on "The Future of Payments" Organised by the Bank of England

The Bank of England is hosting a conference on "The Future of Payments" on 19–20 May 2005 in London. The aim is to broach some forward-looking issues on how payment systems might evolve in the future – and, as importantly, to explore the implications of these developments for public policy in general and central banks in particular.

The conference will comprise a set of invited papers and comments on the following topics:

- monetary theory and policy and payment systems;
- regulatory challenges in payment systems;
- innovation in payment systems;
- payments and the future of central banking.

Contributors will include Neil Wallace, John Moore, Ed Green, Jean-Charles Rochet, Charles Kahn, William Roberts, Xavier Freixas, Randall Wright, Stefan Schmitz, Nobu Kiyotaki, Douglas Gale, George Selgin, V V Chari, Jeffrey Lacker, Charles Freedman and John Mohr.

Places will be limited, but those interested should contact:

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