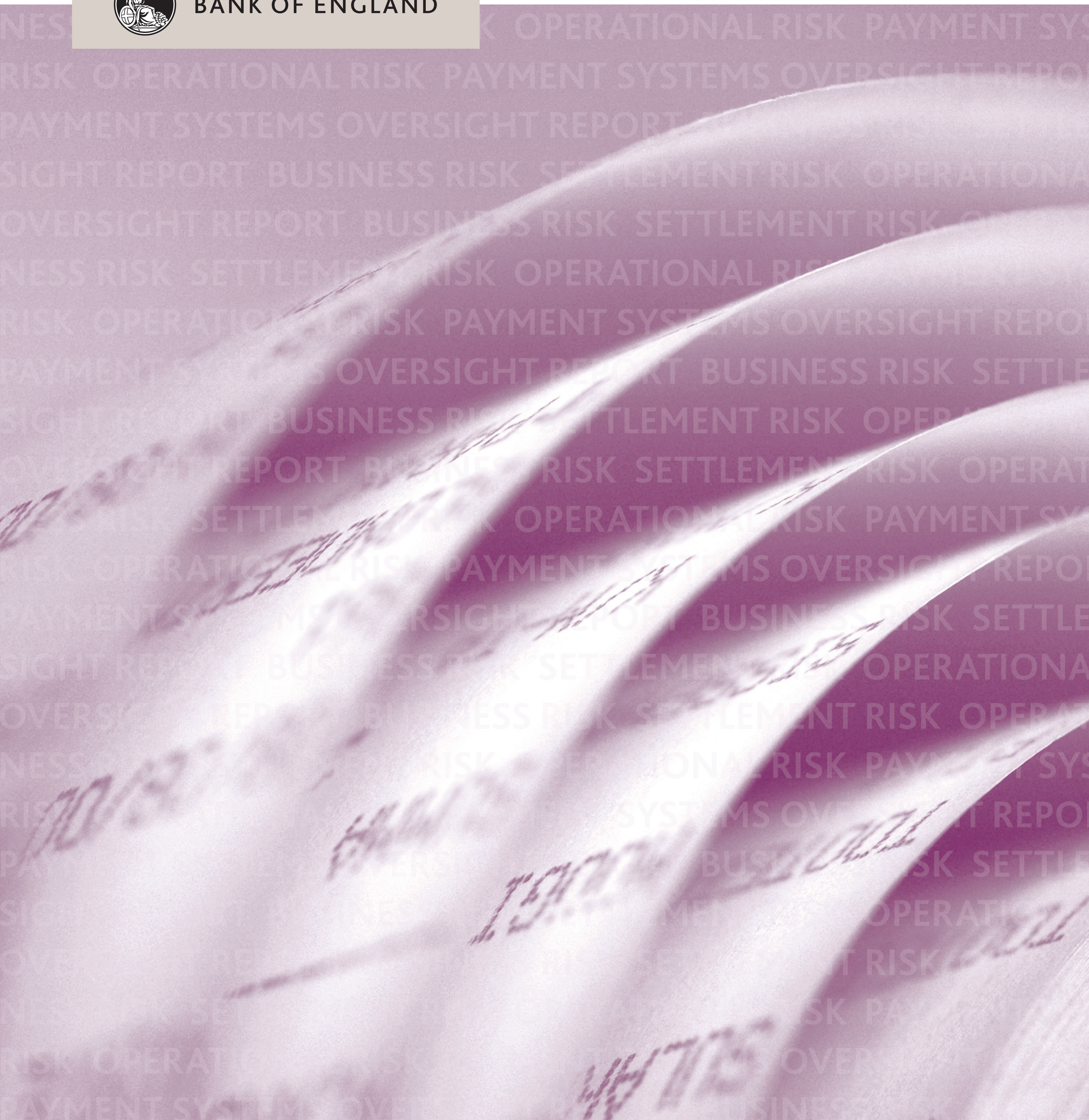
Payment Systems Oversight Report 2006

February 2007 | Issue No. 3

BANK OF ENGLAND



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Executive summary

Payment systems are fundamental to the functioning of the economy. This *Oversight Report* summarises the developments in the key UK payment systems over the past year and explains the focus of the Bank's work in this field.

In common with the two previous *Oversight Reports*, the overall message is encouraging: the main UK payment systems continue to exhibit a high level of robustness by international standards. In particular, the high-value payment systems come close to observing fully the internationally recognised standard of the Core Principles for Systemically Important Payment Systems.

The Bank's oversight activity in the past year has aimed at further addressing systemic risk in UK payment systems. Progress has been made in a number of the areas identified in previous *Oversight Reports*, including:

- initiatives across a number of overseen payment systems to strengthen resilience to major operational disruption and to improve and test business continuity procedures;
- legal work by CHAPSCo relating to members incorporated overseas;
- the establishment of the CREST Settlement Bank Committee to act as a dedicated forum to review issues relating to CREST's interbank payment arrangements;
- implementation of NewBACS which provides functionality which could deliver greater observance of the Core Principles in the future;
- contractual separation of the LINK ATM Scheme and the LINK infrastructure company, and enhancements to LINK's Scheme Rules relating to default; and
- significant progress towards the implementation of *Cheque and Debit Recall Agreements*.

Following a number of operational problems, the Bank has changed its assessment of CREST's sterling, euro and US dollar payment arrangements against Core Principle VII — security and operational reliability — to broadly observed.

These developments are described in the main body of the *Report*, along with the highlights of the Bank's assessments of UK payment systems against the Core Principles.

As the *Report* describes, the Bank has developed a risk-based framework to guide its oversight activities — the 'Oversight Risk Framework'. This acts as a complementary tool to the Core Principles, helping the Bank to focus attention where the risks to financial stability are greatest. In the light of the dynamic risk environment in which Payment Systems operate, it is important that risk controls evolve over time. For UK and relevant international systems, the Bank continues to encourage progress where its assessment suggests improvement to be desirable and proportionate to the risk in question.

The structure of this *Oversight Report* is as follows. By way of introduction, Chapter 1 outlines recent work by the Bank to develop a risk-based framework to guide its oversight activities. Developments in individual UK payment systems and summaries of the Bank's updated Core Principles assessments are presented in Chapter 2. Finally, Chapter 3 outlines some of the cross-system issues that have arisen in applying the Oversight Risk Framework. The Bank's detailed assessments of the individual systems against the Core Principles are contained in a separate document ('Detailed assessments of payment systems'), available on the Bank's website (www.bankofengland.co.uk/publications/psor/psorannex2006.pdf).

Contents

Chapter 1: An introduction to payment systems oversight

As this is the third report in the series it focuses on key changes during 2006, rather than covering the issues from first principles. Readers who are less familiar with payment systems might wish to refer to the previous *Oversight Reports* for background information. The role of central banks in the oversight of payment systems was set out in the first and second editions of the *Payment Systems Oversight Report*(1) and in the Bank of England's Spring 2005 *Quarterly Bulletin*.(2) By way of introduction, this year's *Oversight Report* outlines the recent work by the Bank to develop and implement a quantitative, risk-based framework to guide its oversight activities. It then provides a summary of the main developments in the key UK payment systems, through which an estimated total value of around £200 trillion passed in 2006 (**Table A**).

1.1 A risk-based framework for oversight

As described in the 2005 *Oversight Report* the Bank has designed a risk-based approach to oversight to help direct its attention and resources to where the level of risk is greatest. During 2006 the Bank focused on implementing this framework, and using it to identify areas where further improvements are needed. **Box 1** provides further details of how the framework has been designed to meet these objectives.

The risk framework acts as a complementary tool to the Committee on Payment and Settlement Systems Core Principles for Systemically Important Payment Systems. It helps to provide an understanding of: which aspects of non-observance with the Core Principles are most important; how to apply the Core Principles proportionately to systems which are less systemic; and where there is a case to pursue further improvements even when payment systems fully observe the Core Principles.

The Core Principles have provided an excellent starting point for oversight of payment systems and are useful in comparing systems internationally. But there is scope to go further, particularly in a large and complex financial system. Even where systems fully observe the Core Principles, the Bank will continue to be interested in ways of reducing risk further in response to the changing environment, particularly for the most systemic systems, while being mindful of the associated costs.

With a focus on risks and their potential impacts, rather than controls, it is hoped that the systems will participate more actively in the management of systemic risks identified by the Bank. With a clearer understanding of these risks, the overseen systems should be better placed to engage more fully in discussions relating to the most effective controls and developing a proportional response.

In terms of the Better Regulation Commission (BRC)(3) the framework also assists the Bank in meeting the principles of proportionality and consistency in its oversight.

Progress

Since the last *Oversight Report*, settlement risk, operational risk and business risk have been assessed in all the major UK payment systems that the Bank oversees. The results of the framework have been used internally to discuss and agree oversight priorities with Bank senior management.

Results and way forward

The initial results of applying the risk-based framework, which are highlighted in Chapter 3, fit well with the Bank's understanding of the relative risks in the payment systems and have been endorsed by senior management. It is recognised that the framework will need to evolve over time, particularly to adapt to the changing payment system landscape. But even in the first year, the oversight risk framework is adding value in prioritising the Bank's work, in identifying new themes to pursue and in communicating our priorities; both to senior management within the Bank and within the overseen payment systems.

(1) Bank of England (2004 and 2005), *Payment Systems Oversight Report*, available at: www.bankofengland.co.uk/publications/psor/.
(2) Haldane, A and Latter, E (2005), 'The role of central banks in payment systems oversight', *Bank of England Quarterly Bulletin*, Spring, pages 66–71, available at: www.bankofengland.co.uk/publications/quarterlybulletin/qb050106.pdf.
(3) Better Regulation Commission can be found at www.brc.gov.uk.

Table A Volumes, values and main payment types (daily averages)[a]

	Volume	Value (£ millions)[b]	Important payment types	Most likely short-term substitutes
PAYMENT SYSTEMS				
CHAPS				
Sterling	131,045	231,434	• Settlement of financial market transactions	• CHAPS Sterling bypass mode
Euro[c]	30,008	196,820	• House purchases	• Manual procedures for making a small number of payments
			• Other time-critical payments	• Possible use of correspondent banking arrangements for some other payments
			• CLS pay-ins and pay-outs	
BACS	21,193,559	13,555	• Salary and benefit payments • Bill payments by Direct Debit • Telephone and internet banking	• Perhaps limited scope for switching to other instruments in the short term — eg cheques or cash
C&CC[d]	6,985,014	4,877	• 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)[e]	19,532,000	1106	• Payments for goods and services by consumers and businesses	• Cheques • Other card networks • Cash
MasterCard[f] (credit and debit cards)[e]	13,912,000	720	• Payments for goods and services by consumers and businesses	• Cheques • Other card networks • Cash
LINK	7,161,644	281	• Withdrawal of cash using an ATM not operated by the customer's own bank	• Own bank's ATMs • Other cash withdrawal channels
CREST (payment arrangements supporting CREST)[g]				
Sterling		339,349	• Settlement of gilts, equities and money market instruments (including in respect of OMOs and repo market transactions more generally)	• Increased free-of-payment transfers could be accommodatedwithin CREST but with increased principal risk
US dollar		5,220		
Euro		1,014		
Total CREST	291,373	345,583		
LCH.Clearnet Ltd (Protected Payment System)[h]				
Sterling	152	581	• Settlement in respect of cash margin payments	• If disruption does not prevent calculation of settlement obligations, contingency payment procedures may be invoked
US dollar	140	1,123	• Payments for commodity deliveries	
Euro	124	627	• Cash settlements	
Other	207	123	• Default fund contributions	• Contingency algorithms can be used to calculate obligations if usual mechanisms are unavailable
Total LCH	623	2,454		
Foreign exchange settlement system				
CLS[i]				
All currencies	118,000	731,000	• Settlement of foreign exchange trades	• Correspondent banking arrangements in the relevant countries but with increased principal risk
Sterling[j]	19,000	108,000		

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

(a) Except where indicated.
(b) US dollar, euro and 'other' figures are shown as sterling equivalent.
(c) Comprises domestic and cross-border euro payments (including both inward to and outward from the United Kingdom).
(d) Volumes include items drawn on other branches of the same bank. Values only include those drawn on other banks.
(e) Figures for 2005 are shown.
(f) Includes UK Maestro and Solo transactions.
(g) 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 volume figure refers to all transactions processed with CREST, of which not all involve cash movements.
(h) Figures for the LCH.Clearnet Ltd Protected Payment System refer to the sum of all (net) payments between LCH.Clearnet Ltd and its members through the PPS. Volume figures are for the period 2 February 2007 to 14 February 2007.
(i) Each transaction has two 'sides'. Only one side is counted in the volume and value figures.
(j) Trades in which one leg is denominated in sterling.

Box 1 The Oversight Risk Framework

Taking as starting point the Bank's financial stability responsibilities, the framework specifies two channels through which risks in payment systems may adversely impact upon the wider economy:

- **Contagion**, where the crystallisation of risks in payment systems causes the financial difficulties of one institution to be transmitted to other institutions; and

- **Disruption to transactions**, where the crystallisation of risks in payment systems could delay, or even prevent, payments being made by financial institutions, businesses and/or consumers.

  To organise the landscape of risks into a format which lends itself to consistent assessment, the framework places risks into three distinct categories through which these channels could be triggered:

- *Settlement risk*: the risk that a participant in a system cannot or does not meet its financial obligations when, under the rules of the system, they fall due, or that another institution that facilitates the settlement of those obligations — such as the settlement agent — becomes insolvent;

- *Operational risk*: the risk that a system operator or core infrastructure provider to the system is operationally unable to process or settle payments as intended; and

- *Business risk*: the risk that the payment system or any of its components — eg an infrastructure provider serving it — cannot be maintained as a going concern in the face of adverse financial shocks, which may disrupt or terminate its capacity to deliver processing services.

The risks are assessed both in terms of the likelihood of the event occurring and the range of potential impacts should such an event occur. Given the paucity of appropriate data on systemic events in payment systems, some intuitive approximations about the shape of a loss distribution are made. When looking at certain aspects of settlement risk within the framework, the Bank infers the shape of the loss distribution from the current credit quality and exposures of participants. Within other risk-types more limited assumptions are made — for example, that moderate impacts are more likely than extremely large ones. For this type of loss-inducing event, overseers use their expertise to determine plausible scenarios for both a typical and an extreme impact. The results of these assessments are recorded internally in a risk register.

The risk scores take into account the environmental factors affecting the system and the particular controls in place within the system.

It is a key aim of the framework to facilitate consistent comparison both of different risk-types within a system and different risks across systems. Such comparisons require controls and risks to be rated consistently, and all risks to be scored in the same unit of measurement.

A decision was taken at the outset that all impacts should be counted in financial terms, ie in sterling. For contagion impacts, money is a natural unit of measurement but disruption is more naturally measured in time or volume. The solution to this is to consider the costs to the economy of disruption; overseers estimate the cost of transactions being denied, delayed or performed by some substitute means following a disruption to a payment system.
There are two components aimed at ensuring systems are scored in a consistent fashion. The first component is the design of the framework itself which outlines a standard approach. For example, within operational risk, overseers are asked to score risk in at least seven event dimensions (eg utilities failure). The second component is the appointment of a co-ordinator for the framework to take a central view on overseers' risk assessments, mediating the different views and opinions.

The consistency of both the units of measurement and the scoring method were intended to allow for the aggregation of data to provide further management information. Aggregating across risk-types or systems has enabled the Bank to focus on more thematic work.

Table B Summary assessment of the main UK payment systems against the Core Principles

Observed
Broadly observed
Partly observed
Not observed
Not applicable
Under review
Not rated
2005 rating

Core Principles	CHAPS £ & €	CREST £ & €	CREST US$	LCH. Clearnet Ltd PPS(a)	BACS	C&CC	LINK	UK Maestro
I Legal basis	Observed (2005: Broadly observed)	Observed (2005: Observed)	Broadly observed (2005: Broadly observed)	Observed (2005: Observed)	Observed (2005: Observed)	Partly observed (2005: Partly observed)	Broadly observed (2005: Partly observed)	Partly observed (2005: Partly observed)
II Understanding financial risks	Observed (2005: Observed)	Observed (2005: Observed)	Observed (2005: Observed)	Observed (2005: Observed)	Observed (2005: Observed)	Observed (2005: Observed)	Observed (2005: Broadly observed)	Broadly observed (2005: Broadly observed)
III Management of financial risks	Observed (2005: Observed)	Observed (2005: Observed)	Partly observed (2005: Partly observed)	Broadly observed (2005: Broadly observed)	Broadly observed (2005: Broadly observed)	Broadly observed (2005: Broadly observed)	Broadly observed (2005: Partly observed)	Broadly observed (2005: Broadly observed)
IV Prompt final settlement	Observed (2005: Observed)	Observed (2005: Observed)	Partly observed (2005: Partly observed)	Observed (2005: Observed)	Observed (2005: Observed)	Observed (2005: Observed)	Broadly observed (2005: Broadly observed)	Not rated (2005: Not rated)
V Settlement in multilateral netting systems	Not applicable (2005: Not applicable)	Not applicable (2005: Not applicable)	Not applicable (2005: Not applicable)	Not applicable (2005: Not applicable)	Broadly observed (2005: Broadly observed)	Broadly observed (2005: Broadly observed)	Observed (2005: Broadly observed)	Observed (2005: Observed)
VI Settlement asset	Observed (2005: Observed)	Observed (2005: Observed)	Partly observed (2005: Partly observed)	Observed (2005: Observed)	Observed (2005: Observed)	Observed (2005: Observed)	Observed (2005: Observed)	Broadly observed (2005: Broadly observed)
VII Security and operational reliability	Observed (2005: Observed)	Broadly observed (2005: Observed)	Broadly observed (2005: Observed)	Observed (2005: Observed)	Broadly observed (2005: Broadly observed)	Broadly observed (2005: Broadly observed)	Observed (2005: Observed)	Observed (2005: Observed)
VIII Efficiency	Observed (2005: Observed)	Observed (2005: Observed)	Observed (2005: Observed)	Observed (2005: Observed)	Partly observed (2005: Partly observed)	Partly observed (2005: Under review)	Observed (2005: Observed)	Observed (2005: Observed)
IX Access criteria	Broadly observed (2005: Broadly observed)	Partly observed (2005: Partly observed)	Partly observed (2005: Partly observed)	Observed (2005: Observed)	Broadly observed (2005: Broadly observed)	Broadly observed (2005: Broadly observed)	Observed (2005: Observed)	Broadly observed (2005: Broadly observed)
X Governance	Broadly observed (2005: Broadly observed)	Partly observed (2005: Partly observed)	Partly observed (2005: Partly observed)	Observed (2005: Observed)	Broadly observed (2005: Broadly observed)	Broadly observed (2005: Broadly observed)	Observed (2005: Broadly observed)	Broadly observed (2005: Broadly observed)

(a) The LCH.Clearnet Ltd Protected Payments System (PPS) enables settlement of obligations between LCH.Clearnet Ltd and its members in twelve currencies. The assessment shown in **Table B** relates to the three main currencies settled, namely sterling, euro and US dollar. One exception to the assessment shown in **Table B** is that the Bank continues to assess the UK PPS's arrangements for US dollar settlement partly to observe Core Principle VI, and for the US PPS's arrangements for US dollar settlement broadly to observe Core Principle VI (Annex C).

Chapter 2: Key developments in the main UK payment systems

This chapter discusses the main developments in individual UK payment systems during 2006. It draws on updated Core Principles assessments, which are available on the Bank's website. **Table B** summarises the assessments for CHAPS, the payment systems supporting CREST and LCH.Clearnet Ltd, BACS, the Cheque and Credit Clearings, the LINK (ATM) network and the UK Maestro card system. This chapter also reviews the main developments in CLS and SWIFT — two international infrastructures for which the Bank is part of a co-operative oversight process. Risks associated with the main UK debit and credit card systems are also reviewed.

As in the previous *Oversight Reports*, the overall messages are encouraging: high standards are being maintained across the UK payment systems and, over the past year, additional risk-reducing initiatives have been completed. Some Core Principle assessments have been updated to reflect greater compliance and there are a number of actions being taken that will result in the most systemically important systems achieving levels of robustness in excess of those required by the Core Principles but in proportion to their importance to the financial system. At the same time, there are still areas where further risk-reducing measures could usefully be undertaken by each of the operators of UK payment systems. This chapter highlights the main areas where further improvements may be warranted.

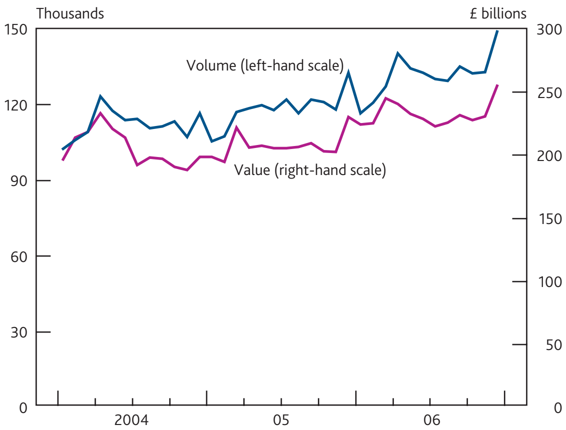
2.1 CHAPS

CHAPS is the United Kingdom's high-value payment system, providing Real-Time Gross Settlement (RTGS) of credit transfers. It consists of two systems: CHAPS Sterling and CHAPS Euro, providing settlement for sterling and euro payments respectively. Provision of RTGS infrastructure is outsourced by CHAPS members to the Bank of England. That relationship is governed by a Memorandum of Understanding (MoU) between the Bank and the CHAPS Clearing Company (CHAPS Co).

There are 14 CHAPS Sterling members (excluding the Bank) and 18 CHAPS Euro members (excluding the Bank). The membership of CHAPS was unchanged during 2006. UBS is expected to join CHAPS Sterling in 2007. CHAPS Euro will be decommissioned in 2008, following implementation of TARGET 2 (discussed in Section 2.2).

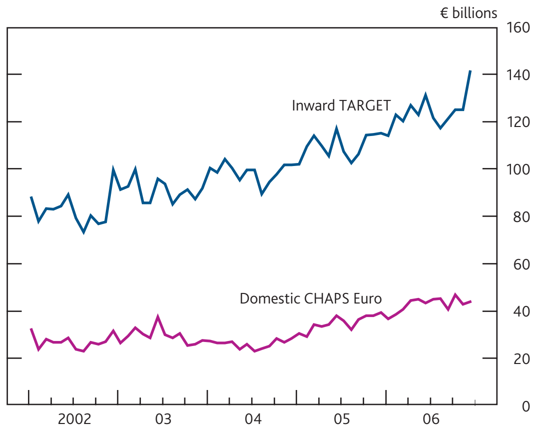
Having levelled out during 2004 and 2005, the aggregate volume and value of payments processed by CHAPS Sterling increased slightly during 2006 (**Chart 1**), as did the value of domestic CHAPS Euro payments and TARGET payments (**Chart 2**).

Chart 1 Average daily volume and value of payments processed in CHAPS Sterling



Source: Bank of England.

Chart 2 Average daily value of CHAPS Euro payments and payments sent to the United Kingdom via TARGET(a)



Source: Bank of England.

(a) The value of payments sent to the United Kingdom via TARGET is approximately equal to the value of payments sent out of the United Kingdom via TARGET.

Combined, these systems continue to process, on a daily basis, payments with an aggregate value of approximately one third of annual nominal UK GDP. It is on that basis, and on account of the critical role CHAPS payments play in distributing liquidity within the United Kingdom's financial sector, that the Bank attaches particular importance to mitigation of risks within CHAPS.

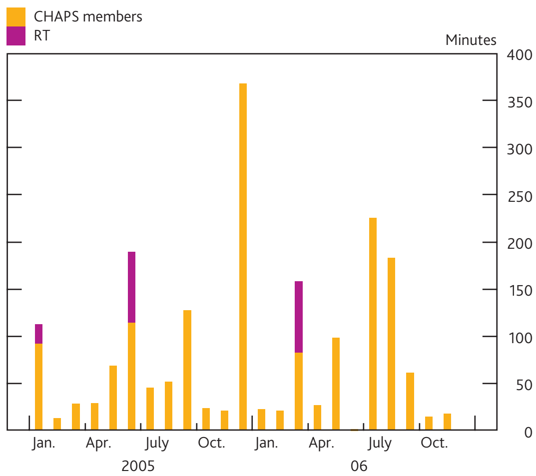
The previous *Oversight Report* assessed CHAPS to fully observe six Core Principles and broadly observe the remaining three. In this *Oversight Report*, the Bank has revised its assessment of CHAPS against Core Principle I to full observance, reflecting completion of legal work by CHAPS Co to confirm the enforceability of system rules under the jurisdictions of members incorporated overseas. This change also brings CHAPS' assessment against Core Principle I into line with those of other payment systems which have been designated under the UK settlement finality regulations. Elsewhere, the Bank's assessment of CHAPS against the Core Principles is unchanged.

CHAPS remains an inherently robust payment system, commensurate with its systemic significance. In normal circumstances CHAPS operates on a RTGS basis, eliminating settlement risk. But because CHAPS member banks rely on the RTGS infrastructure to manage their liquidity on a continuous basis, this brings management of operational risks to the fore, both within the infrastructure and at a member level. As operational risks have become better managed and, in some instances, removed from the system, the focus of the Bank's oversight dialogue with CHAPS Co and the resources of the scheme company have moved to the mitigation of low likelihood risk events, the impact of which could potentially be large and extend beyond the users of CHAPS. That focus on low likelihood events has meant it has become important for both the scheme company and the Bank, as overseer, to consider whether the cost of proposed mitigants is proportionate to the materiality of the risk in question. When it can be demonstrated that such costs are proportionate, action should be taken.

Operational risk (Core Principle VII)

The reliability of the CHAPS central infrastructure improved during 2006. The operational performance of the RTGS infrastructure was particularly strong, there being only one month in 2006 when the MoU requirement for 99.95% availability was breached, compared with two in 2005. In all other months, the RTGS infrastructure recorded 100% availability. The limited operational disruption that did occur typically arose at the member level (**Chart 3**). As per 2005, CHAPS experienced no down time due to SWIFT being unavailable. More recently, on 12 February 2007, connectivity problems affected the RTGS infrastructure, preventing members from submitting settlement instructions to RTGS via SWIFT. This was caused by localised problems affecting software supporting RTGS, rather than the wider SWIFT network. The impact of the incident was limited by successful operation of contingency arrangements for certain payments before connectivity was restored. Following restoration of RTGS' SWIFT connection, all outstanding payments were settled the same day.

Chart 3 Monthly downtime of RT and CHAPS Sterling members[(a)]



Source: Bank of England and CHAPS Co.

(a) Weighted by value of payments. RT weighted at 100%.

The deterioration in member throughput performance described in the previous *Oversight Report* continued during 2006, with a handful of CHAPS members consistently breaching agreed throughput requirements.[(1)] Because this appears to reflect structural changes in the distribution of payment submission times rather than liquidity constraints, CHAPS Co's procedures now enable members to demonstrate the amount of liquidity available is sufficient to meet throughput requirements, even in the absence of actual payment throughput. This approach will be reviewed in 2007, to determine whether deeper changes to throughput requirements are needed. The Bank continues to view the requirements as a key control for liquidity risk within the system.

During 2006 the frequency and aggregate duration of cut-off extensions to the daily CHAPS timetable requested by members decreased compared to 2005. The average duration of those extensions was also shorter. CREST Co was the source of a number of CHAPS extensions during 2006, as that system experienced operational problems following migration to a new settlement engine (Section 2.3). That system-level problems within CREST gave rise to extensions in CHAPS, requiring RTGS to remain open longer, reflects both systems' reliance on that infrastructure. Notably, those extensions were longer in aggregate and average duration than those requested by CHAPS members. They also fall outside of CHAPS' peer pressure approach to member discipline. The Bank continues to view such an approach as an effective one, which could usefully be adopted by other UK payment systems.

(1) During each CHAPS day, members are required to have settled 50% of all payments (by value) by 12:00 and 75% by 14:30.

Improving member-level resilience

Disruption to members' ability to make CHAPS payments can arise from a number of sources. One potential source is loss of SWIFT connectivity, which would severely impair the ability of a member to make both proprietary and customer payments. The Bank has therefore welcomed and encouraged work by CHAPS Co in 2006 which has considered how the likelihood of a member losing its SWIFT connection could be further reduced. Correctly implemented, tougher requirements to ensure diversity of network partners used by members to connect to SWIFT will enhance the resilience of members' ability to make payments in CHAPS and, potentially, other SWIFT-dependent payment systems.

In extremis, problems affecting the ability of CHAPS members to connect to SWIFT could require fax-based contingency arrangements to be invoked. Whilst testing of payment schedule contingency arrangements has indicated participating members have the operational capacity to exchange payment information bilaterally, there remains a need for CHAPS Co to ensure thorough testing of corresponding procedures for the submission of settlement instructions (to the Bank) via fax. Such testing should determine members' ability to prioritise certain payments (ie those with systemic characteristics, discussed below) for settlement via contingency arrangements. Although the response to recent problems with RTGS' connection to SWIFT suggested members have the operational capacity to prioritise certain time-critical payments, such as CLS pay-ins, testing of fax-based arrangements for settlement of potentially systemic CHAPS payments (eg interbank loans, used for liquidity management purposes) is an issue the Bank expects CHAPS Co to progress during the coming year. Insofar as other UK payment systems have SWIFT dependencies, there may be scope for taking this forward as part of a broader work-stream with other systemically significant payment systems.

Business continuity planning (Core Principle VII)

As described above, during 2006 the risk mitigation work of CHAPS Co has increasingly focused on reducing the impact arising from crystallisation of low likelihood events which might require business continuity plans to be invoked. Positively, initiatives such as the Tripartite Resilience Benchmarking Project have shown recovery processes supporting the RTGS infrastructure used by CHAPS to be close to best practice. The Bank noted in the July 2006 *Financial Stability Report* that testing of business continuity plans by market infrastructures should involve the user community.[1] For CHAPS Co that means continuing to orchestrate its rigorous, co-ordinated testing of business continuity arrangements across the central infrastructure and CHAPS members; testing should not only be conducted by members in isolation.

More broadly, the interdependence of UK and international payments infrastructure means that a problem in one part of that infrastructure or one participant can be quickly transmitted to and affect other infrastructure and participants. As already noted, problems in CREST during August and September resulted in numerous extensions to the CHAPS processing day, adversely impacting on members despite the problem originating outside of that system. This highlights the importance of good communication between systems reliant on common infrastructure. It also points to the need for CHAPS, along with the wider payments industry, to ensure testing of contingency procedures is conducted on a cross-system basis wherever feasible, factoring in key interdependencies. Section 3.2 reviews the case for such testing, over and above that conducted already through, for example, Market Wide Exercises organised by the Tripartite authorities.

Third operating site

The previous *Oversight Report* noted how the benchmark for resilience of the most important parts of the financial infrastructure continues to rise. For CHAPS, a significant degree of resilience is provided by the RTGS infrastructure operating across two sites, both offering full operational capacity and the ability to quickly move processing between sites on an intraday basis. However, given CHAPS' systemic significance, it remains important that due consideration continues to be given to further strengthening that resilience, for example by reviewing the case for establishing a third site.

Liquidity and settlement risk (Core Principles III, V and IX)

Impact of Money Market Reform

In May 2006 the Bank implemented reforms to the sterling money markets — Money Market Reform (MMR). MMR, in particular the introduction of target balances held at the Bank (the reserves scheme) and standing facilities, have reduced liquidity risk in CHAPS Sterling by offering a greater range of sources of liquidity with which to fund payments. **Box 2** explores the implications of MMR for the risk profile of CHAPS Sterling.

Bypass mode

The previous two *Oversight Reports* highlighted how operating RTGS in bypass mode — where settlement takes place on an end-of-day multilateral net basis — introduces settlement risk into CHAPS.[2] Bypass mode has not, to date, ever been invoked. But whilst the likelihood of a member default being coincident with RTGS operating in bypass mode is very low, the impact of any such default, in terms of outstanding exposures, could be large. And whilst net sender caps can limit

(1) Bank of England *Financial Stability Report*, July 2006, pages 60–61.
(2) CHAPS would be required to operate in bypass mode in the very unlikely event of operational problems preventing the operation of RTGS infrastructure at both sites. There is no bypass mode for CHAPS Euro.

Box 2 CHAPS Sterling and Money Market Reform

Background

Changes to the sterling money markets — Money Market Reform (MMR) — were implemented by the Bank in May 2006. The new framework, described in the Red Book,[1] has altered the way in which the Bank's monetary operations influence liquidity risks within CHAPS Sterling. They may also reduce risks associated with the tiered nature of CHAPS Sterling membership.

Reserves as intraday liquidity

Because CHAPS Sterling operates on a RTGS basis, this places higher liquidity demands on member banks than if the system operated on a deferred net settlement basis. Prior to MMR, balances held at the Bank were unremunerated. CHAPS Sterling members thus sought to hold only very small balances with the Bank overnight. Liquidity demands were met by the Bank providing intraday credit to members through same-day sale-and-repurchase transactions — ie extension of central bank credit against eligible collateral purchased from the member (a reverse repo).

Following MMR, the introduction of reserves (balances held at the Bank and remunerated at the Bank Rate) has provided member banks with an additional source of liquidity with which to fund payments in CHAPS Sterling. All CHAPS Sterling banks are members of the reserves scheme also, therefore MMR has enabled members to substitute reserves for eligible collateral sold to the Bank. For UK banks, this flexibility of approach to funding payments is supported by both reserves and collateral eligible for repo to the Bank being recognised as liquid assets under the FSA's Sterling Stock Liqudity Regime (SSLR), which requires UK banks to maintain a stock of such assets on their balance sheets for prudential purposes (ie to meet possible liquidity demands).[2]

But despite their equivalence in terms of funding CHAPS Sterling payments and treatment under the SSLR, reserves and eligible collateral are not perfect substitutes. A key design feature of the reserves scheme is that a bank's reserve balances can fluctuate from day to day, provided that the average level is within a range of +/– 1% around a target balance, set by the bank itself over the course of a maintenance period running from one MPC decision date until the next. This 'averaging' component of the reserves scheme removes the need for CHAPS Sterling members to square-up end-of-day positions with the Bank, except on the final day of a maintenance period. Members must avoid overnight overdrafts. But because balances can be varied freely to meet day-to-day liquidity needs, including CHAPS Sterling payments, reserves can be used by members as a liquidity buffer to accommodate unexpected payment in/outflows late in the day.[3]

Initial analysis by the Bank has suggested that in aggregate, the value of reserve balances has not been fully offset by a reduction in the value of eligible collateral posted. The amount of liquidity available to fund payments has therefore increased. In isolation, this represents a reduction in liquidity risk in CHAPS Sterling. Whether this effect of MMR is a permanent one remains unclear: the liqudity buffer benefits offered by reserves and reserve averaging could potentially enable CHAPS Sterling members to reduce any precautionary component of eligible collateral repoed to the Bank. The Bank will continue to monitor liquidity management behaviour in CHAPS Sterling.

Tiering

A further innovation introduced by MMR has been the establishment of standing lending facilities. These provide access (at a penal rate)[4] to liquidity via overnight reverse repo for banks, including those which are not CHAPS Sterling members.

Standing lending facilities could reduce the risks associated with the degree of tiering observed in CHAPS Sterling. Specifically, they can help mitigate the impact on non-members of operational problems affecting their CHAPS correspondent bank which might preclude that bank from extending liquidity to its customers. By having access to standing lending facilities, a bank which is not a CHAPS Sterling member will be able to access liquidity during stressed market conditions, when CHAPS members may be less willing to extend intraday credit to customers. In this sense, standing lending facilities provide a form of liquidity insurance to the banking system against unexpected payment flows and idiosyncratic stresses. Chapter 3 considers this issue in further detail.

(1) *The Framework for the Bank of England's Operations in the Sterling Money Markets*, February 2007. Available at: www.bankofengland.co.uk/markets/money/publications/redbookfeb07.pdf.
(2) Use of eligible collateral and reserves is facilitated by SSLR requirements applying only at the end of the day. Previous analysis by the Bank has explored the role of the requirements in determining collateral posting decisions in CHAPS Sterling. See *Financial Stability Review*, December 2004 (pages 99–104).
(3) The capacity of reserves to act as a liquidity buffer will diminish over the course of a maintenance period, as members seek to ensure they can meet their target balance on average. Interest penalties are applied if, at the end of the maintenance period, scheme members fail to achieve their reserves target by holding an average level of reserves higher or lower than the specified range.
(4) On the final day of the maintenance period, the interest rate on the standing lending facility is 25 basis points above the Bank's official rate. At other times during the maintenance period the interest rate is 100 basis points above the Bank's official rate.

those exposures, they could also distort payment flows. Consequently, CHAPS Co is investigating the extent to which an increase in the number of settlement cycles in bypass mode might reduce the magnitude of exposures without significantly impeding such flows. Successful completion, which the Bank views as a priority for 2007, would represent a further reduction in the already low risk profile of CHAPS.

Strategic challenges (Core Principle VIII)

The cost of implementing changes to improve the resilience of the infrastructure supporting CHAPS payments is borne by system members through an annual fixed fee and the per debit item tariff established by the Bank, which seeks to fully recover operating costs. Increases in that per payment tariff could dull the incentive for members to invest in further risk-reducing functionality.

Faster Payments

In October CHAPS Co was selected as scheme management company for the new Faster Payments service, which the industry is working to launch in late 2007. The immediate challenge concerns CHAPS Co's ability to fulfil its critical role in the Faster Payments project — most obviously through establishing appropriate rules and default arrangements — whilst continuing to prioritise the robust processing of CHAPS payments. The Bank has encouraged CHAPS Co to co-operate closely with other scheme companies — most obviously BPSL — to meet the resource challenge from managing two (quite different) payment schemes.

In the short to medium term, a successful Faster Payments service will present CHAPS Co and its members with the challenge of an increase in the unit cost of making CHAPS payments, as volume migrates to the new service. Because around 90% of CHAPS Sterling payment volumes are for amounts of less than £1 million, the scale of any migration could, over time, be large. There will remain a subset of payments requiring immediate settlement finality which should continue to settle on a RTGS basis, reflecting their potentially systemic characteristics. These payments are typically of large absolute value and exhibit either a high degree of system interdependence (eg CLS pay-ins) or market interdependence (eg interbank loans for liquidity management purposes). But migration of other payments — eg house purchases — is unlikely to increase systemic risk, both because of their characteristics and the design of the Faster Payments system. **Box 3** explores these design aspects further. A challenge for CHAPS Co (and the Bank) will be to ensure that using RTGS for large-value time-critical payments remains economically attractive, despite Faster Payments causing a reduction in the demand for CHAPS payments.

Consolidation of payment infrastructure

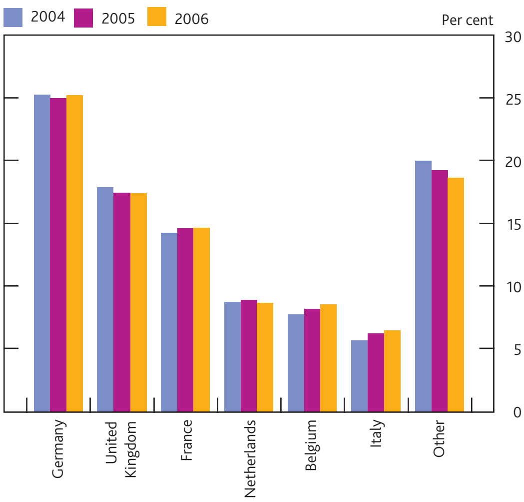
To the extent that a successful Faster Payments service drives the cost of making CHAPS payments upwards by attracting volumes from that system, one response could be for banks to seek convergence of the RTGS and Faster Payments infrastructures. CHAPS Co and the member banks are well placed, along with the Bank, to shape that debate and advance the industry's thinking through its emerging strategy for future needs from and use of a RTGS infrastructure. The extent to which this may result in demand for consolidation of infrastructures, and its impact upon the Bank's oversight objectives, are considered in Section 3.5.

2.2 TARGET

The TARGET (Trans-European Automated Real-time Gross settlement Express Transfer) system is a network of national euro RTGS components, which includes CHAPS Euro. The UK component is, along with all other TARGET components, subject to the collective oversight arrangements of the European System of Central Banks. Such oversight is discharged through application of the *TARGET Oversight Guide*.(1)

CHAPS Euro is the second largest component of TARGET by both value and volume of cross-border payments (**Chart 4**). Moreover, the robustness of CHAPS Euro within TARGET compares well to other national components. During 2006 the United Kingdom recorded aggregate down time of 60 minutes and average availability of 99.96%, compared to 99.90% average availability for TARGET as a whole.

Chart 4 Share of cross-border TARGET payments by component(a)



Source: European Central Bank.

(a) Value of outward cross-border TARGET payments.

The existing TARGET system will be superseded, from November 2007, by TARGET 2, which will replace the existing network of national RTGS components with a single shared

(1) Ahead of implementation of the TARGET Oversight Guide, CHAPS Euro was assessed against the Core Principles, alongside other TARGET components. A summary of the assessments was published in May 2004 — see: www.ecb.int/pub/pdf/other/assessmenteurolargevaluepayments2004en.pdf. This report updates the Bank's assessment of CHAPS Euro.

Box 3 Faster electronic payments

Background

As described in the previous *Oversight Report*, the UK payments industry is, in response to findings of the OFT-led Payment Systems Task Force, working to deliver a new Faster Payments service by November 2007.

The design of Faster Payments

The main innovation offered by the Faster Payments service will be enabling users (customers) to initiate electronic payments spontaneously, via internet or telephone banking, for execution on a near real time basis. Additionally, standing order payments (where the customer is not present but the instruction has been lodged with their bank) will be executed through the new service on a same-day basis, eliminating float on these payments.(1) Settlement of all payments processed by the new service will occur through one of three same-day settlement cycles. This will represent a significant reduction in the three-day settlement cycle which standing order payments currently operate to in BACS.

A new central infrastructure will process payment information to enable members of the new service to update the accounts of customers using Faster Payments in near real time or on a same-day basis, depending on the payment instrument used. The central infrastructure will also calculate multilateral net positions of members as they develop over the course of each cycle, at the end of which positions are forwarded to the Bank, to be extinguished across settlement accounts held there. A new settlement cycle will be immediately initiated once a cut-off time for the preceding cycle has been reached, rather than waiting for settlement of the latter. The system operator will also be able to request an *ad-hoc* settlement cycle, should the need arise (for example, in the event of operational problems within the central infrastructure preventing the completion of a scheduled settlement cycle).

The central infrastructure supporting Faster Payments will be provided by Immediate Payments Limited (IPL), a joint venture between Voca (currently infrastructure provider to BACS) and the LINK Interchange Network. The CHAPS Clearing Company will take on scheme management responsibilities for the new service at the point of go-live, with the relationship between the scheme and its infrastructure provider governed by a Managed Services Agreement and supported by service level agreements. The scheme company will also enforce the rules of the new service and be responsible for the implementation of, for example, default arrangements and incident escalation procedures. These are currently being drawn up.

Oversight issues

The Bank will have an oversight interest in the new service. As for other payment systems in the United Kingdom, this interest will in no way be a substitute for proper risk management by CHAPS Co and IPL.

The introduction of Faster Payments will prompt migration of standing order payments from the BACS payment system and migration of lower value payments from CHAPS. For the first group, settlement risk will be significantly reduced by the design of Faster Payments, ie through compression of the current three-day cycle. For the second group, settlement risk will increase due to the move from a real time gross settlement model. However, initial work by the Bank has indicated that, on the basis of preliminary volume forecasts, Faster Payments should reduce aggregate settlement risk within the UK payments industry.

This is a welcome development, which partly reflects the risk controls which will be enforced within the central infrastructure. Net sender caps will limit exposures building up between members during each settlement cycle. If these caps are reached, settlement of some payments will be deferred until the next cycle. Additionally, individual transaction limits will mitigate settlement risk and help to control fraud. Initially, transaction limits will be set at £10,000 (more for standing order payments), restricting migration of payments from CHAPS Sterling. Both net sender caps and individual transaction limits will be reviewed after service go live and periodically thereafter. This will help to ensure they remain at a level sufficient to control risks (ie not so high as to attract systemic payments from CHAPS Sterling) but not at the expense of materially distorting payment flows (ie not so low that lower-value, non systemic payments remain in CHAPS Sterling).

The introduction of Faster Payments has prompted the payments industry to consider the strategic case for future consolidation of payments infrastructure in the United Kingdom. This poses interesting questions in terms of systemic risk. In particular, whilst convergence and, prospectively, consolidation could deliver efficiency gains to users, this could be at the expense of introducing single points of failure which if affected by some operational disruption could *ceteris paribus* generate larger adverse impacts. It then becomes important for the payments industry to ensure sufficient resiliency is incorporated into the design of future UK payment infrastructure exhibiting a higher degree of interdependency. This topic is considered in greater detail in Section 3.2.

(1) When a user executes a standing order payment, the payment value can be debited from the payer's account prior to the day on which interbank settlement occurs. In such circumstances, the paying bank may be able to earn interest on those funds for the period prior to interbank settlement. It can also be the case that the payee's bank receives funds through interbank settlement one or more days before giving value to the payee and earns interest in the interim. In both cases, interest earned is referred to as float.

platform. Following the Bank's decision not to join TARGET 2 and ahead of the subsequent closure of CHAPS Euro (expected in 2008), members will need to review their arrangements for effecting cross-border and domestic large value euro payments from the United Kingdom. Similarly, it will be important for CHAPS Co, in close co-operation with its members and the Bank, to manage the closure of CHAPS euro in a smooth fashion.

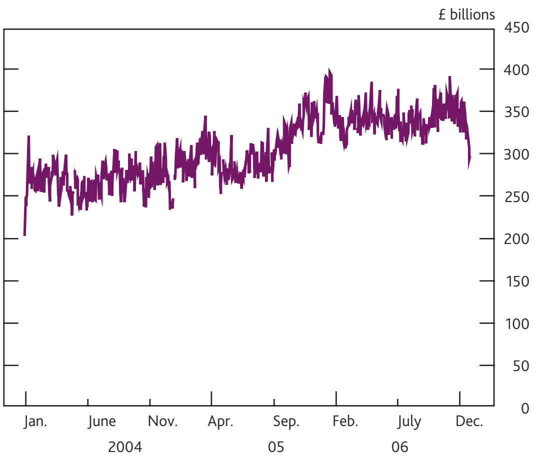
One feature of the existing CHAPS Euro system is the ability of members to use euro cash balances to support intraday borrowings in CHAPS Sterling. The Bank is currently working with CHAPS Co to design an equivalent facility for use post-TARGET 2. As overseer, the Bank has placed particular value on retaining such a facility, because it will ensure CHAPS Sterling members will have access to a similar range of contingency liquidity sources as they do at present.

2.3 CREST

CREST is the United Kingdom's securities settlement system, providing a Delivery versus Payment (DvP) settlement service for gilts, equities and money market instruments. CRESTCo, a wholly-owned subsidiary of Euroclear SA/NV, is incorporated in the United Kingdom and subject to supervision by the FSA as a Recognised Body. The Bank has responsibility for oversight of the payment arrangements supporting CREST settlement.

CREST provides RTGS in central bank money for transactions in sterling and euro. **Chart 5** shows the daily value of sterling DvP transactions. Averaging approximately £340 billion per day in 2006, these values are larger than those processed in any other payment system overseen by the Bank.(1) In comparison, euro values are small, averaging only €1.5 billion per day (£1.0 billion sterling equivalent).

Chart 5 Daily value of sterling DvP transactions in CREST



Source: CRESTCo.

CREST also provides for transactions to be settled in US dollars. This is supported by bilateral net settlement through correspondents in the United States. In 2006, dollar settlement values averaged approximately $9.5 billion per day (roughly £5.2 billion sterling equivalent).

Cash settlement is provided by 15 settlement banks(2) to over 2,600 corporate institutions and over 41,000 personal members.

The previous *Oversight Report* assessed CREST's sterling and euro payment arrangements to observe fully seven of the nine relevant Core Principles. The US dollar payment arrangements — and most notably, the interbank settlement of those payments — fell short of full observance in a number of areas (just three of the nine relevant Core Principles were fully observed).

In this *Oversight Report*, the Bank has changed its assessments of CREST's sterling, euro and US dollar payment arrangements against Core Principle VII (from fully to broadly observed). This change reflects weaknesses revealed by recent operational problems following a major system implementation. These are discussed in more detail below.

Assessments against other Core Principles are unchanged from those in the previous *Oversight Report*. However, over the last year, progress has been made in a number of areas. In particular, a working group has been considering possible improvements to the interbank payment arrangements for US dollars and a more formal governance framework for CREST's interbank payment arrangements has been established. Work is also under way to ensure that all access criteria which apply to CREST settlement banks are publicly disclosed. Once fully implemented, these changes will help to address remaining weaknesses highlighted in the previous *Oversight Report*.

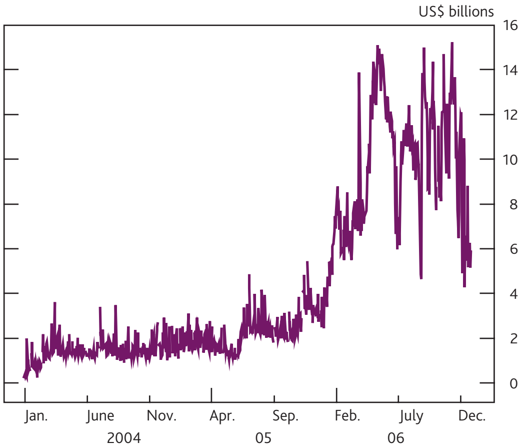
Together with the FSA, the Bank carried out an updated assessment of CREST against the CPSS-IOSCO Recommendations for Securities Settlement Systems. This assessment, available on the Bank's website,(3) covered a wider range of a securities settlement system's activities than the Core Principles. In the Bank and the FSA's view, CRESTCo fully observed all the applicable recommendations. This assessment pre-dated CREST's migration to the Single Settlement Engine and subsequent operational problems.

Settlement risk (Core Principles II,IV,V,VI)

Although US dollar settlement values remain small relative to those for sterling settlement, they have risen significantly during the past twelve months (**Chart 6**).

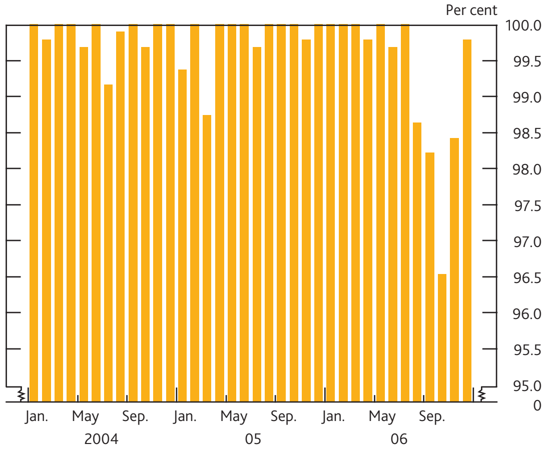
(1) This figure does not include liquidity flows generated by the Self-Collateralised Repo mechanism. This mechanism enables settlement banks to use certain categories of security as collateral for raising additional central bank liquidity on the platform.
(2) In one, two, or all three of the CREST settlement banks currencies.
(3) www.bankofengland.co.uk/publications/other/financialstability/fsap/crestassess.pdf.

Chart 6 Daily value of US dollar transactions in CREST



Source: CRESTCo.

Chart 7 CREST system availability for settlement



Source: CRESTCo.

Interbank obligations arising from CREST US dollar transactions are settled on an end-of-US day bilateral net basis, through settlement banks' correspondents in the United States. The arrangements between each CREST member and their settlement bank are a matter for them to agree bilaterally. However, in general, these contracts specify that credits to a client are conditional upon the settlement bank's actual receipt of funds from the debtor's settlement bank.(1) Assuming such arrangements are enforceable, members are exposed to the risk that, having delivered a security, they fail to receive payment (or payment is clawed back) because their counterparty's settlement bank has failed to deliver. As values have risen, the size of these intraday exposures has increased.

In October 2006, CRESTCo established a small working group (involving the major US dollar settlement banks, the Bank and APACS) to identify a solution which would significantly and permanently reduce these risks. Work is ongoing.

Operational risk (Core Principle VII)

CREST linked to Euroclear's Single Settlement Engine (the SSE) in August 2006. The SSE will bring the settlement systems of the Euroclear Group together onto a single processing engine; an important milestone in Euroclear's long-term business plan.

CREST experienced a number of operational problems directly and indirectly related to the SSE implementation. In the period August to October 2006, settlement outages totalled nearly 900 minutes, including seven settlement days on which outages lasted over one hour. Operational difficulties continued into November. **Chart 7** shows CREST system availability for settlement.

On 29 August, the first day of sterling settlement on the SSE, a software bug affecting communication between the SSE and the CREST system resulted in a three hour outage. As a result, CHAPS processing had to be extended, sterling deadlines were pushed back to around 19:15, and major banks were only able to close their systems and process client accounts after 20:00.

Further operational incidents occurred in September, October and November. Although not as serious as those immediately following the launch, these caused considerable inconvenience for some members and necessitated extensions to CREST settlement with knock-on extensions in CHAPS. There were a further three settlement outages in December and January.

The Bank has discussed, and continues to follow up, these operational problems in detail with CRESTCo and Euroclear, focusing particularly on the lessons for change management, testing and trialling, incident management and crisis communication. Euroclear have undertaken a Post Implementation Review, drawing together the lessons learnt from the recent CREST problems. In addition to a number of more specific mitigating actions, Euroclear intend to build a permanent performance test environment which would provide for rigorous application testing — including client interaction — alongside normal operations. In particular, the recent CREST problems highlight the need for more rigorous testing of the processes close to critical deadlines and of software fixes and patches. Euroclear's Post Implementation Review also proposes improvements to communication with stakeholders and clients.

Some of these issues have been pursued in conjunction with the FSA. In addition, the Euroclear Regulatory College (the co-operative oversight arrangement for the Euroclear group) has reviewed these findings and is working with Euroclear to ensure that the lessons are taken on board ahead of future software launches and system changes.

In light of the weaknesses highlighted by the operational incidents described above, the Bank assesses CREST broadly to observe Core Principle VII. The Bank will review this assessment once changes arising from the Post Implementation Review have had time to bed down.

(1) Commonly, the contracts enable settlement banks to claw-back funds they have paid to their clients if they themselves fail to receive payment.

Business continuity planning (Core Principle VII)

As part of Euroclear's Data Centre Strategy, CREST's systems will have migrated to new data centres in Continental Europe by mid 2007. Euroclear Bank, Euroclear France and Euroclear Netherlands migrated to these data centres in 2006.

Because of the greater geographical distance between the two new sites, CREST's migration will reduce the risk of an incident at the primary data centre also impacting business at the back-up site. CRESTCo and Euroclear are working to ensure that the migration is adequately managed and that operational risk controls following migration are at least as resilient as current arrangements. In the light of the concentration of several markets' settlement activity onto a single processing platform and common data centres, the Bank is working with other authorities in the regulatory college to ensure that robust business continuity arrangements are in place following migration.

Governance (Core Principles X)

The previous *Oversight Reports* highlighted shortcomings in the governance of the interbank settlement arrangements supporting CREST settlement. The operational problems following the SSE launch underlined the need to consider the form and quality of CRESTCo's interaction with settlement banks, both when CREST is operating as normal and in the management of operational incidents.

To address this, CRESTCo has, in consultation with the Bank and APACS, established a new Settlement Bank Committee. This Committee, which met for the first time in February 2007, is expected to act as a dedicated forum for discussion of issues relating to the interbank payment arrangements supporting CREST settlement. This should strengthen observance of Core Principle X.

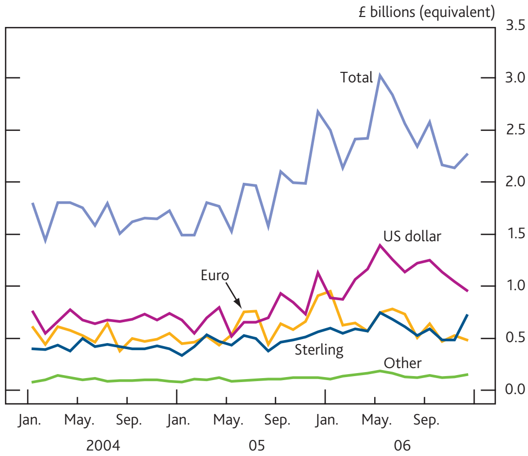
2.4 LCH.Clearnet Ltd

LCH.Clearnet Ltd is the main central counterparty (CCP) in the United Kingdom. It is incorporated in the United Kingdom as a private limited company, and is regulated by the FSA as a Recognised Clearing House (RCH) under the Financial Services and Markets Act (FSMA). The Bank oversees LCH.Clearnet Ltd's operation of its embedded payment arrangements, the Protected Payments System (PPS).

LCH.Clearnet Ltd transfers margin and other cash to and from its members through the PPS. A network of commercial banks, known as PPS banks, provide accounts to both LCH.Clearnet Ltd and its members in one or more of the currencies in which liabilities are incurred.

Chart 8 shows the average value of payments made between LCH.Clearnet Ltd and its members through the UK PPS. While the amounts are relatively small in comparison with those made through some other systems overseen by the Bank, the flows are primarily margin, and so reflect only a small percentage of the value of the contracts that LCH.Clearnet Ltd clears. Problems with the PPS could potentially cause wide disruption to financial markets and institutions, since LCH.Clearnet Ltd operates as CCP, taking on the credit risk of both counterparties in a single trade, in a number of key markets, and the PPS is crucial to the practical implementation of LCH.Clearnet Ltd's management of its counterparty risk.

Chart 8 Average daily flows over the UK PPS,[a] by currency



Sources: LCH.Clearnet Ltd and Bank calculations.

(a) LCH.Clearnet Ltd Protected Payments System.

The Bank assesses the UK PPS to fully observe eight of the nine relevant Core Principles for sterling and euro payments. The US dollar payment arrangements fully observe seven of the relevant Core Principles, as the US PPS continues to fall short of full observance of Core Principle VI.

Together with the FSA, the Bank carried out an updated assessment of LCH.Clearnet Ltd against the CPSS-IOSCO recommendations for CCPs. This assessment, available on the Bank's website,[1] covers a range of CCP activities which are beyond the scope of the assessment of the Core Principles. In the Bank and the FSA's view, LCH.Clearnet Ltd fully observes fourteen of the fifteen CPSS-IOSCO Recommendations for CCPs, and broadly observes Recommendation 9 on money settlement arrangements.

Settlement risk (Core Principles III and VI)

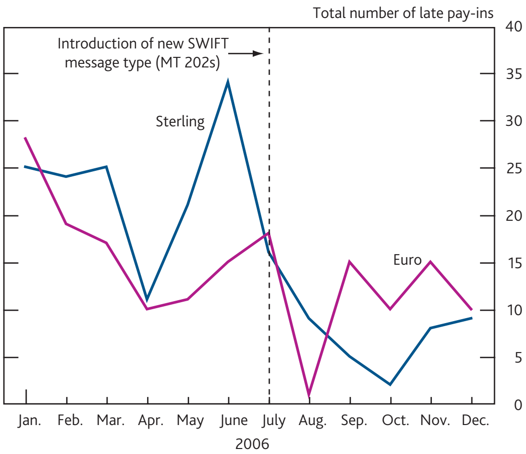
The previous *Oversight Report* recommended further observance by the PPS banks in meeting the two-hour deadline for the transfer of funds to the concentration bank. It noted that if the performance of PPS banks in meeting the deadline improved, this would reduce credit and liquidity pressures on LCH.Clearnet Ltd, and strengthen the PPS's observance of Core Principle III.

In July 2006, LCH.Clearnet Ltd introduced a new SWIFT messaging type which allowed the straight-through processing

(1) www.bankofengland.co.uk/publications/other/financialstability/fsap/lchassess.pdf.

of transfers from the PPS banks to the concentration bank. **Chart 9** shows that, since the introduction of the new message type, there has been a reduction in the number of banks that miss the deadline for sterling pay-ins. However, a number of banks continue to miss the deadline, particularly for euro pay-ins. Given this, the Bank continues to assess the PPS as falling short of full observance of Core Principle III.

Chart 9 Number of late sterling and euro pay-ins per month



Sources: LCH.Clearnet Ltd and Bank calculations.

LCH.Clearnet Ltd has used the Bank of England as its concentration bank for sterling and euro since September 2005, a move which eliminated the credit and liquidity risks posed by using a commercial bank settlement asset for these currencies. The 2005 *Oversight Report* recommended improvements to the US PPS, which uses a commercial bank as its concentration bank. LCH.Clearnet Ltd has been investigating ways to reduce settlement risk in the US PPS, for example, by holding US dollar funds in the form of central bank balances but a solution has yet to be identified. The Bank therefore continues to assess the US PPS as falling short of full compliance of Core Principle VI.

Strategy

In 2006, there were changes in the senior management teams at both LCH.Clearnet Ltd and LCH.Clearnet Group Ltd (the holding company of LCH.Clearnet Ltd and LCH.Clearnet SA). LCH.Clearnet Ltd appointed a new CEO and LCH.Clearnet Group Ltd a new Chairman and Group CEO, following the resignations earlier in the year of the previous holders of these positions.

The new senior management teams have already taken a number of decisions including — at LCH.Clearnet Ltd — the closure of two IT projects, a number of staff changes and some reductions in fees. The Bank, in conjunction with the other central banks and supervisors involved in the regulation and oversight of the Group, will continue to assess the effect of these and other changes.

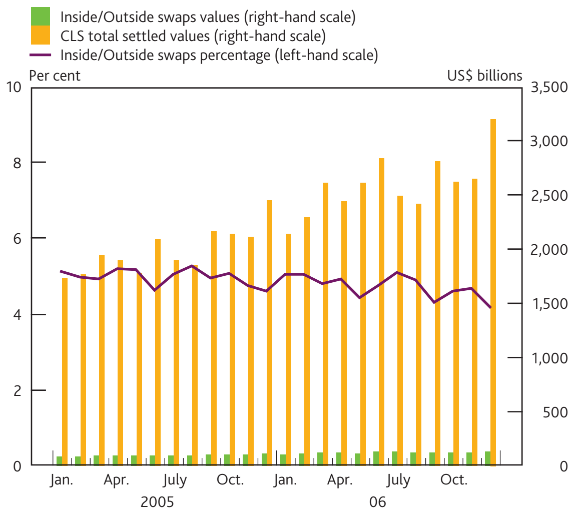
2.5 CLS

Continuous Linked Settlement (CLS) is designed to eliminate principal risk in the settlement of foreign exchange transactions. The US Federal Reserve authorised the establishment, and is the primary supervisor and lead overseer of, CLS Bank International, the institution that provides the CLS service. Together with the other central banks (including the Bank of England) participating in the co-operative oversight of CLS, the Federal Reserve formally assesses the system against the Core Principles.

Settlement and liquidity risk (Core Principle III)

Central bank overseers seek to ensure that CLS Bank's risk management and operational procedures are effective and are consistent with the Core Principles. As noted in the previous *Oversight Report*, one focus of oversight has been the use of the CLS Inside/Outside (I/O) swap mechanism. The mechanism is used by many settlement members to reduce the liquidity pressures generated by their pay-in requirements, but reintroduces principal risk outside the system.[1] **Chart 10** shows that the share of I/O swaps as a proportion of the total principal risk eliminated by the system remained relatively small in 2006, averaging around 5%. The liquidity/principal risk trade-off in CLS therefore remains acceptable.

Chart 10 Inside/Outside swaps[a]



Source: CLS Bank International.

(a) The chart compares the average daily value of Inside/Outside swaps with the average daily total values settled in CLS. It also shows the percentage of prinicpal risk reintroduced outside the system by the Inside/Outside swap mechanism.

CLS Bank continues to work with members to develop new ways of expanding the scope of the risk-reduction and cost-saving benefits that it offers. In September 2005, it announced plans to offer services for the settlement of cash

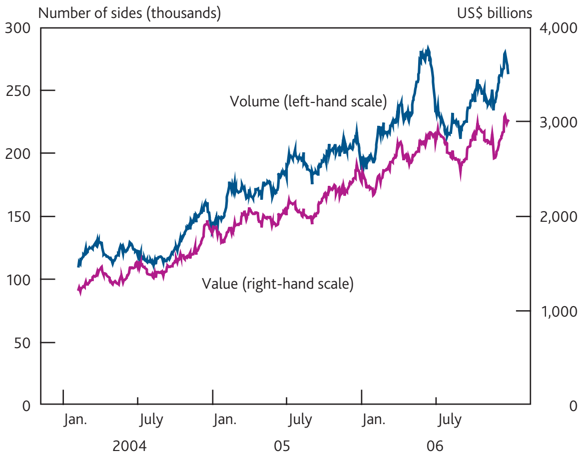
(1) Continuous Linked Settlement (CLS) and foreign exchange settlement risk, Bank of England *Financial Stability Review*, December 2004, pages 86–92. This article also gives more information on the Inside/Outside swap mechanism, as well as setting out more broadly issues relating to the contribution by CLS to reducing foreign exchange settlement risk.

flow positions for non-deliverable forwards and foreign exchange option premiums. The initial timetable has been lengthened and those services are now scheduled to be introduced in a phased approach. Non-deliverable forwards are targeted to go live in summer 2007, and foreign exchange option premiums afterwards. CLS Bank also plans a service to settle payments arising from credit derivative contracts, in conjunction with DTCC. Consideration is being given to the introduction of other new services, including the settlement of additional currencies. Overseers will be working with CLS to satisfy themselves that the proposed new services are introduced without adding undue risks to the system or its members. Future developments to the CLS service could also include the introduction of additional (later) settlement sessions, which could be used to settle same-day foreign exchange trades.(1) Such trades are agreed too late for settlement in the existing main settlement window, and can therefore not currently benefit from the reduction in principal risk provided by CLS.

Foreign exchange settlement risk

The central banks that oversee CLS also look more broadly and monitor the long-term progress of the G10 strategy to reduce foreign exchange settlement risk. **Chart 11** shows that values and volumes of trades settled in CLS, and hence for which principal risk is eliminated, continued to increase in 2006. Factors responsible for the growth included a further increase in the number of third-party users (from 660 at the end of 2005 to 900 at the end of 2006) and existing members settling a larger share of their trades in CLS.

Chart 11 Daily volumes and values settled in CLS (30-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.

New currencies may be introduced into the system in the future if they satisfy CLS's eligibility criteria and the system with the new currencies observes the Core Principles. The next two currencies CLS Bank plans to introduce are the Mexican peso and the Israeli shekel.

CLS Bank appears to have captured a significant share of the foreign exchange transactions of the largest banks active in the foreign exchange market. For instance, in the United Kingdom, the four major banks operating in the foreign exchange market (Barclays, HSBC, RBS and Standard Chartered) have been settlement members since CLS went live (although not all their transactions are eligible for CLS). A number of other UK banks active in the foreign exchange market participate in CLS as third-party users, as do two UK building societies. But only a small number of non-bank UK institutions are currently third-party users.

Overall, however, estimates suggest that a substantial share of global foreign exchange settlement may still be taking place outside CLS.(2) Central banks continue to assess what further action is necessary to ensure the success of the G10 strategy to reduce foreign exchange settlement risk. As part of this process, they have undertaken a major survey to assess how banks and other financial institutions currently settle their foreign exchange transactions, and how well the ensuing risks are managed and controlled. The survey, which included a number of key UK players, was conducted during 2006 and the results are currently being analysed. It is expected to be published by the BIS during the course of 2007.

Operational risk (Core Principle VII)

Management of operational risk is given a high priority by CLS Bank and the overseeing central banks, in particular to minimise the potential cross-border impact of an operational failure affecting any of its settled currencies. During 2006 CLS experienced a few incidents of mainly low severity that had little or no adverse impact on settlement and pay-out target deadlines. There were no instances of the system failing to settle all the transactions submitted to it at the start of its settlement day.

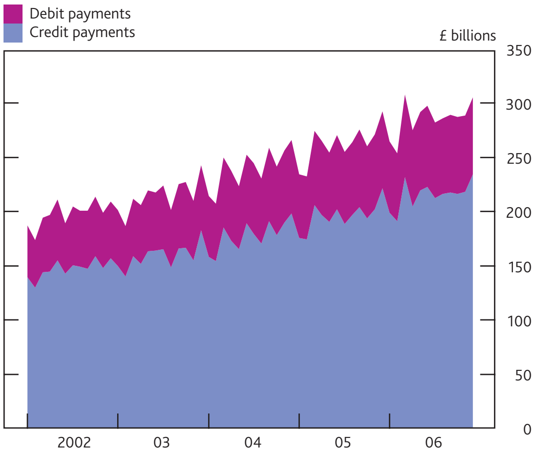
CLS Bank has undertaken a number of initiatives to strengthen further its resilience to a major operational disruption. The work in 2006 fell into two broad categories: physical resilience, and education. The former includes the completion of a new operational centre, and progress towards creating an out of region data centre. CLS Bank has initiated an education programme to enhance members' understanding of the processes and issues that will arise in a crisis. A walk through of a hypothetical crisis situation with members of the United Kingdom's FX Joint Standing Committee was a very useful initiative in this area. Such initiatives are important in ensuring preparedness for a crisis and further work should be encouraged.

(1) This might include settling some of the current out legs of Inside/Outside swap transactions.
(2) The four UK CLS settlement members reported in 2005 Q3 that they were settling on average between 40% and 65% of the total value of their foreign exchange trades through CLS.

2.6 BACS

BACS is the United Kingdom's largest retail payment system by volume, processing on average 21 million electronic payments (Direct Debits, Direct Credits and Standing Orders) with a value of £13.6 billion each day during 2006.(1) In 2006 the total value of BACS payments processed grew by around 10% year on year (**Chart 12**), while the aggregate volume of those payments grew by almost 5% year on year.

Chart 12 Monthly values processed in BACS by payment instrument



Sources: APACS and Voca Ltd calculations.

Danske Bank joined BACS in May 2006: the first bank to join in about ten years and the first overseas domiciled member to be admitted. There are now 15 BACS members and approximately 700 BACS Approved Bureaux (BABs),(2) plus 29 Affiliates, a class introduced in December 2005 as a representative body.(3)

The previous *Oversight Report* assessed BACS to observe fully four Core Principles and to observe broadly a further five. In relation to Core Principle VIII, concerning practicality and efficiency, the Bank assessed BACS to be partly observant.

The Bank's assessment of BACS remains unchanged this year, although good progress has been made in a number of areas, most notably the implementation of NewBACS Phase I.

NewBACS

Phase I of the NewBACS project was successfully implemented in July 2006 and has proved to be operationally robust. This large and complex programme of work involved the upgrade of Voca's systems and networks and its success was due to the mutual co-operation between BPSL (as scheme management company), its members and Voca.

The key deliverable of NewBACS was the new processing platform, required mainly to ensure sufficient processing capacity for future forecast payment volumes. It also offers the ability to provide risk-reducing functionality such as debit caps and regression. From a user perspective, NewBACS also provides a new payment submission channel — BACSTEL-IP — offering users greater security and faster payment confirmation; all users have been migrated to BACSTEL-IP since March 2006.

Phase II, including the move of the REMIT application onto a more modern architecture was completed in December 2006. The final step in the technology renewal at Voca is the migration of members from the legacy High Speed Transmission (HST) channel to either Voca's IP based channel (ETS — Enhanced Transmission Service) or SWIFTNet Transmission Service (STS). This is of far smaller scale and complexity than Phase I, nevertheless it still requires strong co-ordinated project management and clear plans to ensure successful delivery. BPSL, Voca and the members will need to continue to work closely to ensure this milestone is achieved.

Settlement risk (Core Principles III and V)

In the previous *Oversight Report* the Bank assessed BACS to observe broadly Core Principles III and V following the implementation of the Liquidity Funding and Collateralisation Agreement (LFCA) in May 2005.

Whilst the LFCA has significantly reduced settlement risk in BACS (and the C&CC) it has not eliminated it completely, because the obligations to the system of an affected member could still exceed the amount of liquidity committed by other members. Functionality to address this risk by capping debit positions within BACS is now available through the NewBACS processing platform and work has commenced to investigate the practical issues around the introduction of debit caps.

NewBACS also provides the functionality to remove the payments of an affected member from the start of the processing day (so-called 'regression'). System exclusion functionality is also in place to remove payments from a specific point in time, or from the start of the next processing day. Removing the affected member's intraday exposures on the day of default would reduce further the probability of the affected member's settlement obligations being larger than the liquidity committed under the LFCA.

The successful implementation of debit caps and regression functionality would reduce or cap the potential size of the obligation to the system of a defaulting member in BACS, potentially delivering greater observance of Core Principles III and V.

(1) BACS Payment Schemes Ltd (BPSL) is responsible for the Direct Credit, Direct Debit and standing order payment products. The core processing of these transactions is outsourced to a single third party — Voca Ltd.
(2) A BAB is any organisation that wishes to submit financial transactions through the BACS clearing system on behalf of external third party legal entities. Under current regulations, they must apply to BPSL to register as a BACS Commercial Bureau.
(3) The Affiliates Interest Group acts as the main vehicle for communications and decision making amongst BACS affiliates. Anyone can become a BACS affiliate, but is specifically aimed at current account providers, originators of high volumes of Direct Debit/Direct Cedit, BACS bureau service providers, trade bodies etc.

Investigations have begun into whether the current three-day BACS settlement cycle could be shortened; however there is not a strong business case for a great deal of work to be undertaken on this at present as more clarity is sought following the introduction of the Payment Services Directive (PSD), which is due to be adopted in 2007. The PSD is expected to introduce a requirement that direct credits and direct debits are credited to the payee's payment account by the end of the next working day after the point in time of receipt, which would require BPSL to deliver T+1 processing for all BACS payments that have not migrated to Faster Payments.

Faster Payments

The introduction of Faster Payments (see **Box 3**) will significantly reduce settlement risk for some current BACS payments, by offering an alternative service with a reduced timescale. It is expected that most standing order payments will migrate to Faster Payments and analysis is under way by BPSL to estimate the potential effect to BACS of the migration of these payments. Both BACS and Faster Payments will share some of the same central infrastructure, hence increasing system interdependencies. CHAPSCo, the Faster Payments scheme management company and BPSL will need to work closely over the coming year to investigate and mitigate the potential impact of any failure of either Voca's settlement infrastructure or a member-specific problem.

In the absence of a two-day cycle in BACS, the Bank has assessed BACS partly to observe Core Principle VIII. Although beyond BPSL's control, successful delivery of the Faster Payments service should help BACS achieve greater observance of Core Principle VIII because some payments will migrate to the new service and those payments remaining within BACS will be made through a payment system with a clearing cycle of appropriate duration for users.

Operational risk (Core Principle VII)

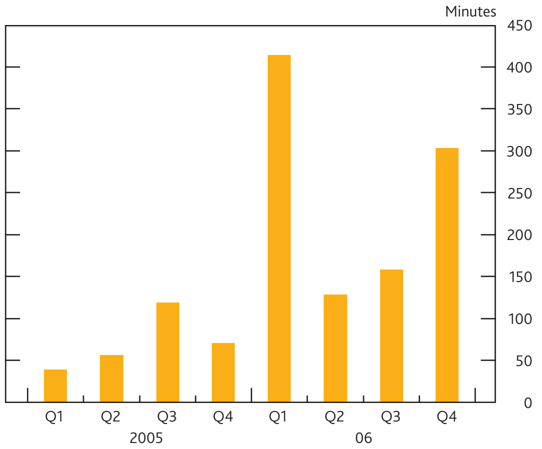
Voca Limited is a key third-party supplier of the central infrastructure required to process BACS payments on behalf of BPSL. Therefore the impact of operational risk to BACS of Voca failing for any reason is high. Voca has been working hard to improve its financial robustness during 2006, reaching agreement with shareholders on specific methods of raising the additional capital.

Since the implementation of NewBACS operational robustness has been sound with all Service Level Agreements (SLAs) having been attained. Performance against these SLAs is monitored by BPSL on a monthly basis and the existing SLAs are currently being reviewed with Voca and the members to reflect several months of live operation of NewBACS.

The current SLA requirement for BACSTEL-IP to exhibit 99.5% availability each month has been attained and regularly surpassed. Given the SLA of 99.5% is set at a lower level than some other payment systems, where SLA's can range from 99.95% to 99.9999%, the Bank has encouraged BPSL to assess whether there is merit in increasing the requirement when it reviews the other aspects of the SLA. Should tighter operational controls be introduced this would deliver greater observance of CP VII.

Cumulative delays to settlement caused by members were significantly higher during 2006 than 2005 although each incident remained generally of short duration (**Chart 13**).

Chart 13 Cumulative settlement delays in BACS



Source: Bank of England.

Business continuity planning (Core Principles V, VII)

It is important for member banks to understand the potential implications should, for example, operational/system problems arise at Voca causing a significant delay to output. If a delay of more than one processing day occurred, members could be required to process two or more days output in a single day. Agreed procedures for handling such a backlog of payments are being devised and are expected to be implemented within 2007. This work stream is important to mitigate any operational problems arising, particularly at a member level or at the central infrastructure. These procedures would help improve the operational robustness of BACS and would enable member banks to have greater certainty regarding the impact of a significant processing outage on their customers.

Access and governance (Core Principles IX and X)

The Bank assesses BACS broadly to observe Core Principles IX and X. Since the previous *Oversight Report* BPSL has continued to work to improve access and governance arrangements and encourage membership.

Following the OFT *Payment Systems Task Force Report* a new membership category has been introduced, the BACS Affiliates Group. This was formally launched in December 2005 and it acts as the main vehicle for communications and decision making among the BACS affiliates,(1) volunteering attendees to assist BPSL with investigating potential innovations and

(1) BACS Affiliates consists of corporate users, consumer representative bodies etc.

educational opportunities relating to BACS. Membership has increased steadily over the year to 29, and is expected to grow in 2007.

BPSL (and C&CCC) have also been considering how to deal with a settlement member whose credit quality deteriorates to an extent that it brings a high level of financial risk to the multilateral settlement. The review is expected to complete in 2007.

Strategic challenges

The Single Euro Payments Area (SEPA) plans to establish a single area for electronic payments in euros throughout the European Union, integrating the methods for making these payments. The industry timelines state that SEPA schemes will be available to customers by 1 January 2008 and by end 2010 most euro payment traffic will flow through the pan-European schemes.

Both BPSL and Voca are actively involved in developing internal standards in order to ensure SEPA compliance. Adopting SEPA standards could enable them to exploit a wider range of infrastructure options in the future, one example of which would be a more contestable market at a European level.

Box 4 Governance of the UK payments industry

Background

Following his *Pre-Budget Report* in 2003, the Chancellor of the Exchequer asked the OFT to establish a Payment Systems Task Force (PSTF) to consider competition, efficiency and incentive issues relating to payment systems.(1) During 2006, the Task Force recommended the approval of the payments industry's suggested reform to the governance arrangements in the UK payments industry and the establishment of an industry-wide body, recently named the Payments Council.

Core Principle X highlights the importance of good governance for payment systems. The Bank recognises good governance as a key principle of well-functioning financial infrastructure because it can help to reduce operational, credit, liquidity and business risk. Good governance arrangements may well involve the direct representation of external stakeholders on the payment system operators' decision-making bodies.(2)

The Payments Council

The Payments Council will play the role of a strategic governance body for the payments industry in the United Kingdom. Its objectives are to deliver innovation; ensure that payment systems are open and accountable; and maintain the integrity of the payment systems. Payment schemes remain responsible for the day-to-day management of their payment systems, including risk management.

External stakeholders will be able to influence the Payments Council's decision-making in a variety of ways. Most importantly, the Payments Council's board will include an independent chairman and four independent directors (alongside eleven bank-appointed directors). The Bank will have observer status. The independent directors can collectively block a Payments Council decision if they fear that external stakeholders' interests are not given sufficient weight.

As chairs of fora for key groups of users of payment systems, the independent directors will also have a role in channelling the views of external stakeholders to the Payments Council's board. As Payments Council board members, they will participate in the evaluation of proposals for innovation in payment systems, including with respect to their impact on financial stability. More generally, it is intended that the independent directors and the independent chairman broaden the expertise of the Payments Council board.

The Payments Council will enter into contracts with the scheme companies, under the terms of which schemes agree to comply with directions given by the Payments Council board.(3) Individual payment service providers can become members of the Payments Council; as members, they would become bound by the Payments Council board's decisions.

Transparency of the decision-making process will be achieved through broad consultation of stakeholders ahead of decisions, and the publication of the Payments Council *Annual Report*, which will include a section written by the independent directors. In addition, records of the Payments Council's proceedings will be publicly available.

Next steps

The Payments Council will be implemented in 2007 and will monitor schemes' progress with the workstreams initiated by the PSTF. The OFT will review the Payments Council against its objectives after two years.

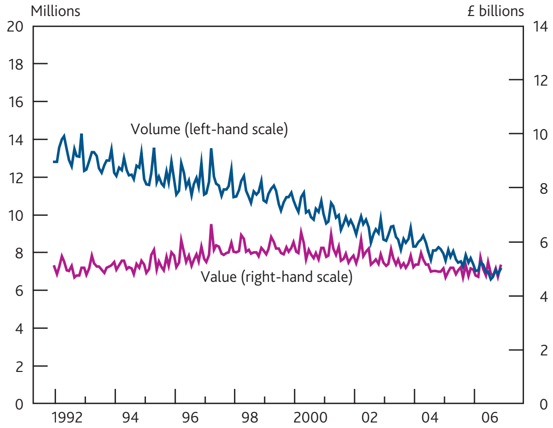
The Bank will continue its oversight relationship with the individual schemes. The Bank will also continue to explore the implications of industry-wide developments in payment systems on monetary and financial stability and develop a relationship with the Payments Council to this purpose.

(1) The Task Force included representatives from consumer and business associations, as well as the operators of UK payment systems. The Bank and HM Treasury participated as observers.
(2) Bank of England (2004), *Payment Systems Oversight Report*, page 51, and Bank of England (2005), *Payment Systems Oversight Report*, page 46, available at: www.bankofengland.co.uk/publications/psor/index.htm.
(3) Major UK schemes (CHAPS, BACS and Cheque and Credit and LINK) intend to enter such contracts at the outset; others are considering an alternative form of association with the Payments Council.

2.7 The Cheque and Credit Clearings

The Cheque and Credit Clearings (C&CC) enable instructions given in paper form (cheques and paper credits) to be processed, exchanged and settled between banks. The C&CC are managed by the Cheque and Credit Clearing Company (C&CCC). The paper clearings process an average of around 7.0 million payments each day, with a total value of around £4.9 billion. The number of C&CC payments processed continues to decline year on year, and by around 49% since 1992, although the nominal value of payments processed has remained relatively constant over this period (**Chart 14**).

Chart 14 Average daily volume and value of payments processed in the C&CC[(a)]



Sources: APACS and Bank calculations.

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

In the previous *Oversight Report*, the Bank assessed the C&CC to observe eight of the Core Principles either fully or broadly. No assessment was made against Core Principle VIII. This year, the Bank assesses the C&CC partly to observe this Core Principle. The other assessments remain unchanged, although significant progress has been made to strengthen observance of Core Principles I, IX and X.

Legal risk (Core Principle I) and settlement risk (Core Principles III and V)

During 2006, significant progress has been made in relation to the implementation of *Cheque and Debit Recall Agreements* and these are due to be signed by the members by the end of 2007 Q1. The implementation of these agreements will further strengthen the C&CC's observance of Core Principle I.

The C&CCC Board have decided to apply for designation under the UK Settlement Finality Directive (SFD) regulations and the application was received in 2007 Q1. Designation under the SFD will provide additional assurance of the enforceability of the system's default arrangements.

All members have agreed to sign up to a Cheque and Debit Recall Agreement, which aims to prevent a liquidator seeking to return via the unpaids process all cheques drawn on a failed member and its customers.[(1)] This agreement will reduce legal, credit and operational risk within the system, strengthening the system's observance of Core Principles I, II, III and VII.

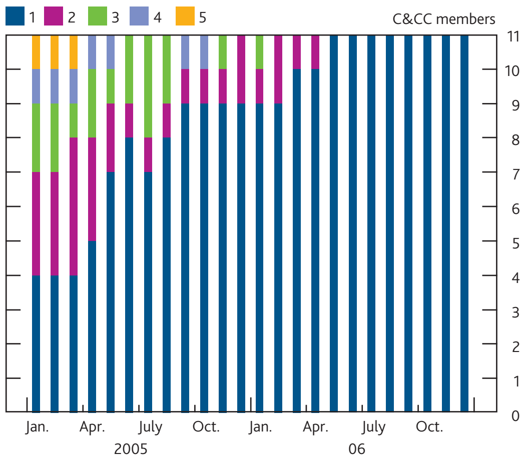
In the previous *Oversight Report*, C&CCC were encouraged to seek legal advice on the existence and extent of conversion risk.[(2)] Counsel opined that, in the event of collecting bank insolvency, it was highly unlikely that the payee would have a claim against the paying bank for any monies lost as a result of the failure of the collecting bank ie that the paying bank would not be subject to conversion risk. There could be merit in explaining in customer 'Terms and Conditions' that payment and collection of cheques would be carried out in accordance with the rules of the system.

The C&CC have developed a high-value settlement adjustment process to deal with significant errors in settlement figures. This process has been in place in all non-automated[(3)] clearings since June 2006, thereby mitigating the risk of significant errors in settlement figures increasing settlement risk in the system. This enhancement further strengthens observance of Core Principles II and III.

Operational risk (Core Principle VII)

A core piece of infrastructure for the sterling cheque clearing — by far the largest clearing within the C&CC by both value and volume — is the Interbank Data Exchange (IBDE) network, across which details of each cheque are sent to members. During the course of 2006 the IBDE upgrade was completed successfully.

Chart 15 Operational performance against Service Level Codes[(a)]



Sources: C&CCC and Bank calculations.

(a) Performance is categorised from 1 to 5, with 1 being the best performance.

(1) There are instances in which a cheque could not be paid by the paying member bank. For example, if the payer had insufficient funds in its account to cover the full value of the cheque. The unpaids process is used to return to the collecting member bank those cheques that cannot be paid by the paying member bank.
(2) Conversion risk is the theoretical risk that a member (acting in its capacity as a paying bank) might face claims in the tort of conversion from customers of another failed member (acting in its capacity as a collecting bank) if it settled its obligations to the failed member instead of returning the cheque as unpaid.
(3) Sterling credit, euro debit and non-standard paper (NSP).

Operational performance has gradually improved since March 2005. As reported in last year's *Oversight Report*, problems had emerged with delays and rescheduling of the infrastructure consolidation which caused temporary deterioration in members' operational performance. The C&CC is a highly decentralised system and C&CC members are individually responsible for the processing of their paper, with most having chosen to outsource this function to third-party suppliers. The Bank has encouraged the C&CCC to consider the relationship between the Company, the scheme, and third-party suppliers, including perhaps a co-ordinating role in industry-wide projects, or those involving multiple members.

Over time, if the processing model changed, a different relationship structure might be optimal. For example, if further consolidation led to the creation of a single infrastructure provider, a contractual model similar to BACS might be preferred, where the infrastructure provider entered into a service level agreement with both the scheme and also its individual members. This would allow for greater leverage on the supplier, and more transparency between members, the supplier and the scheme as a whole.

Defining more clearly the relationship between the Company, the scheme and third-party suppliers, and ensuring that the C&CCC receives adequate assurance of compliance with the system's audit controls would strengthen the system's compliance with CPVII.

Efficiency and practicality (Core Principle VIII)

The C&CC were not assessed against Core Principle VIII in last year's *Oversight Report* as discussions into what improvements could be made to the current cheque and credit clearings had commenced in October 2005, with establishment of the Cheque Working Group (CWG). Key recommendations of a 'T plus 2-4-6' (see **Box 5**) proposition have now been agreed and are expected to be implemented by November 2007. The Bank assesses the C&CC partly to observe Core Principle VIII. Greater observance may be achieved once these proposals have been implemented in 2007.

Access and governance (Core Principles IX and X)

Last year the Bank assessed the C&CCC broadly to observe Core Principles IX and X. That assessment remains unchanged, although progress has been made in improving the system rules and Governance process.

The Scheme Governance Steering Committee has been reviewing the system rules to address any gaps in the membership criteria, including how to deal with a settlement member whose credit quality deteriorated to an extent that brought a high level of financial risk to the multilateral settlement. The review is expected to be completed during 2007. The implementation of the updated system rules will further strengthen observance of Core Principle IX.
The C&CCC Board has now introduced an independent chairman, to pursue actively incentives and tools for the benefit of the system and its settlement members.

Box 5 Cheque and Credit Clearings

Over the past year significant progress has been made in assessing the current cheque and credit clearings by the Cheque Working Group (CWG), established in October 2005 to investigate whether greater efficiency could be introduced to the clearings. The key recommendations have been agreed and are expected to be implemented by November 2007. The key change will be a 'T plus 2-4-6' proposition offered by the banking industry.(1) The '2-4-6' proposition sets maximum clearing times for value (T plus two), withdrawal (T plus four), and certainty of fate (T plus six) on cheques deposited in the United Kingdom.(2) The maximum times on value and fate will apply to all current, savings and basic bank accounts. The '2-4-6' proposition represents a core offering: financial institutions will, as now, be able to compete to offer shorter timescales.

The CWG considered the costs of shortening the core clearing cycle, but concluded that the costs of such a change far outweighed the benefits. The declining use of cheques, which was likely to accelerate with the introduction of the new Faster Payments service, further weakened any business case for change.

Implementation of the '2-4-6' proposition is scheduled for November 2007, to coincide with the launch of the new Faster Payments service. The '2-4-6' proposition will not require changes to the core interbank clearing cycle. It will, however, require a number of changes to the current arrangements for processing physical cheques. The delivery of cheques to and from Scotland and Northern Ireland will need to be accelerated to fall into line with the English cheque clearing cycle. The current process for returning cheques as unpaid will also have to be improved. APACS estimates the cost of these changes to be in the region of £30 million, with an additional ongoing operational cost of £1.5 million per annum.

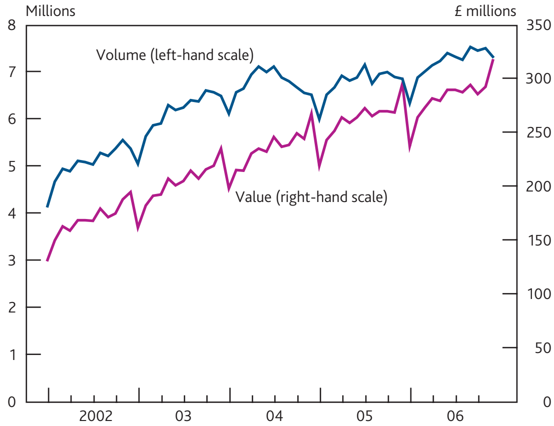
Whilst the '2-4-6' proposition will not reduce the length of the core clearing cycle, it does represent an improvement on the current cheque offering for cheque users. Greater observance of Core Principle VIII may be achieved once these proposals have been implemented in 2007 and maximum clearing times are standardised.

(1) T is defined as the day of deposit of the cheque.
(2) At present customers do not receive value without recourse ('certainty of fate') on cheques, as no point is defined after which a cheque cannot be returned as fraudulent.

2.8 LINK

LINK is the United Kingdom's largest automated teller machine (ATM) network, which enables its members' customers to withdraw cash from most of the United Kingdom's ATMs, irrespective of the bank at which they hold their account. The LINK Interchange Network Ltd consists of the LINK ATM Scheme (the Scheme) and the LINK infrastructure company (the Company). In the year to December 2006, LINK processed a daily average of 7.2 million transactions (mainly cash withdrawals and balance enquiries) with an aggregate value of around £281 million.

Chart 16 Average daily volume and value of payments processed in LINK[(a)]



Source: LINK Interchange Network Ltd and Bank calculations.

(a) Volumes include non-cash withdrawal transactions (such as balance enquiries).

The 2005 *Oversight Report* assessed LINK to fully or broadly observe eight of the Core Principles, and partly observe the other two. Following changes made by LINK during 2006 the Bank has revised the assessment and LINK either fully or broadly observes all ten of the Core Principles.

Legal risk (Core Principle I)

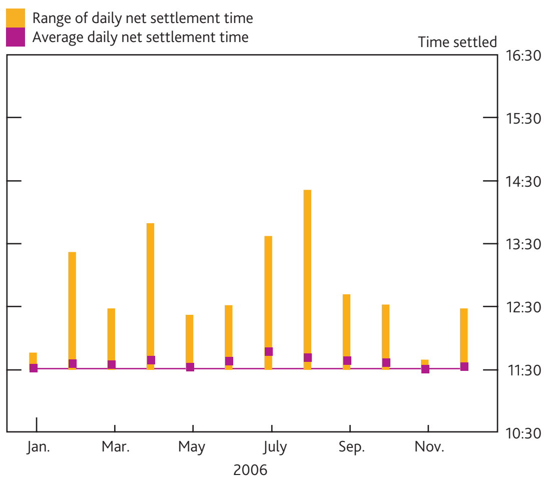
Operating rules were enhanced in 2006, making their legal basis more robust. The rules now state what would happen to aggregate settlement figures in the event of a settlement member default, such that the obligations of members in all circumstances are clearly defined. Consequently, the assessment of LINK against Core Principle I increased to broadly observed.

The 2005 *Oversight Report* noted that additional assurance on the enforceability of the system's default arrangements might be obtained if the Scheme was designated under the UK settlement finality regulations. Designation could enable the scheme to be assessed fully observant of Core Principle I.

Settlement risk (Core Principles II, III and V)

The 2005 *Oversight Report* noted that credit and liquidity risk could be reduced if settlement positions that accumulated over weekends and bank holidays were netted and settled as part of a single aggregate file. A process to do this was introduced in October 2006, improving the assessment of LINK against Core Principle III from partly to broadly observed. During 2006 LINK implemented a number of measures to improve settlement performance, such as formally identifying at the Network Members Council (NMC) any members responsible for a delay to settlement and asking them to report on their plans for preventing any repeat delays, and encouraging settlement members to migrate from banking accounts to reserve accounts at the Bank. These appear to have reduced overall the number of settlement delays caused by members failing to fund their settlement accounts in a timely manner. Almost all of the settlement delays in the second half of 2006 were the result of late funding by Funds Transfer Sharing (FTS) which operates a sub-settlement to the main LINK settlement. FTS and its members are taking action to address this potential weak point in the LINK settlement procedures. Enforcement of the rules agreed in December 2005 to require compulsory minimum balances on accounts held at the Bank from those who delay settlement through late funding could mitigate the risk to timely settlement if this action is unsuccessful in preventing further delays.

Chart 17 Time of LINK daily multilateral net settlement[(a)]



Source: Bank of England.

(a) LINK daily settlement should take place by 11:30.

In the last *Oversight Report*, it was recommended that LINK's system rules should define more clearly the obligation of members in all circumstances, including default. LINK amended the Rules, which now set out how a defaulter's unpaid multilateral net debit amount would be allocated. These changes mean that the default procedures are less likely to be challenged in the event of a settlement member default, and participants' obligations in the system should be clear both under normal circumstances and in the event of default. These changes have strengthened the assessment of LINK against Core Principles II, III and V.

The Company is also developing a new settlement system capable of monitoring participants' settlement positions intraday. This would enable the system to impose debit caps. LINK aims to have this in place for the ATM Scheme in 2008 Q1. This will further strengthen LINK's observance of Core Principle III.

Operational risk (Core Principle VII)

In 2006, LINK implemented a number of changes to improve business continuity planning (BCP). These changes have spanned the four broad areas of expertise, documentation, planning and testing. Developments have included initiatives such as the establishment of an Avian Flu Action Team, the introduction of a new crisis management framework, and desktop exercises testing different crisis scenarios. LINK currently maintains a 'warm' back-up site, and plans to replace this with a 'live' site to allow continuous processing of transactions over two sites. LINK hopes to implement this for the Scheme in 2008 Q1.

Governance (Core Principle X)

The 2005 *Oversight Report* suggested that LINK's observance of Core Principle X would be strengthened if its governance arrangements were enhanced to increase accountability and transparency.

In August 2006, LINK completed work to separate the two entities that the LINK Interchange Network Ltd encompasses, such that the LINK ATM Scheme is now contractually separate from the LINK infrastructure company. Contractual separation involved the implementation of a variety of new documentation, overarching all of which is a Network Members Agreement. Service level agreements are now in place to contractualise the Company's service obligations to the Scheme. In 2006 LINK also introduced a Standing Committee on Consumer Issues, chaired by the independent Non-Executive Chairman of the NMC, to represent the interest of consumers and advise the NMC on consumer issues that relate to the LINK ATM Scheme Rules. The changes to governance arrangements have made reporting lines clearer, and the Scheme Director now reports to the NMC instead of the CEO of the Company as previously.

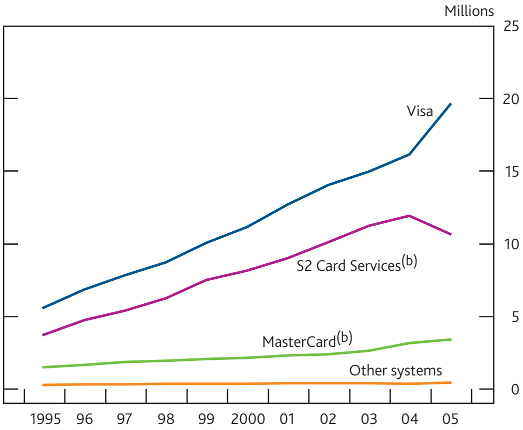
As a result of these changes, the assessment of LINK against Core Principle X has improved from broadly to fully observed.

2.9 Debit and credit cards

The main credit and debit card systems in the United Kingdom are operated by Visa Europe and MasterCard Europe. These systems process an average of 33 million electronic payments worth around £1.8 billion per working day (**Charts 18** and **19**).

In 2005, the migration of authorisation, clearing and settlement processing of UK Maestro and Solo transactions onto the MasterCard Europe platforms was successfully completed. No significant issues arose during 2006 as a result

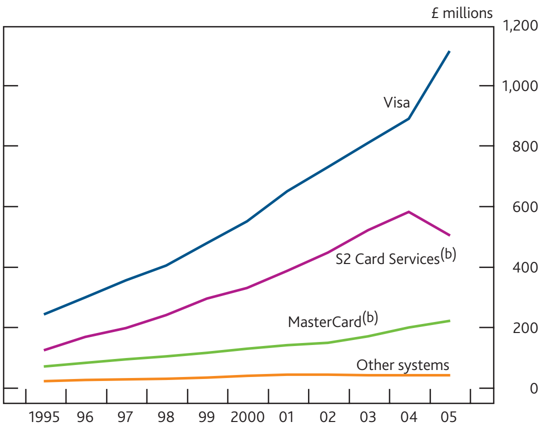
Chart 18 Average daily volume of payments through the debit and credit card systems[(a)]



Sources: APACS and Bank calculations.

(a) Data includes 'on-us' transactions (where the merchant and cardholder use the same member/licensee). 'On-us' transactions are processed internally by the member/licensee.
(b) Since 2004 S2 Card Services' transactions have been processed by MasterCard. Average daily volume of transactions processed by MasterCard in 2005: 13.9 million.

Chart 19 Average daily value of payments through the debit and credit card systems[(a)]



Sources: APACS and Bank calculations.

(a) Data includes 'on-us' transactions (where the merchant and cardholder use the same member/licensee). 'On-us' transactions are processed internally by the member/licensee.
(b) Since 2004 S2 Card Services' transactions have been processed by MasterCard. Average daily value of transactions processed by MasterCard in 2005: £720 million.

of this initiative and the UK Domestic Maestro and Solo schemes are now operated on a day-to-day basis by MasterCard Europe, although legal responsibility for the schemes remains with S2 Services Limited (S2).

The UK Domestic Maestro scheme meets fully or broadly eight of the Core Principles. In 2006, the level of compliance did not change compared to 2005, as no improvement had been made to the definition of the point of final settlement. Further information on this can be found in the full assessment.

The Bank has not assessed the Visa credit, Visa debit or MasterCard credit schemes against the Core Principles, but continues to liaise with both Visa Europe and MasterCard Europe over their sterling settlement arrangements and business continuity planning.

Management of the MasterCard credit and Visa credit and debit schemes is conducted on an international basis, and the Bank discusses with other central banks how they can best co-operate to oversee these schemes. In particular, the Bank involves the European Central Bank (ECB) in the oversight of Visa Europe, as although located in London, Visa Europe is a significant operator in the Euro area credit card market. As an overseer of Visa Europe, the Bank has been participating in an ECB initiative to develop Oversight Requirements for Card Payment Schemes offering services in Euro inside the Euro area.

2.10 SWIFT

SWIFT provides secure messaging services to financial institutions and market infrastructures covering nearly 8,000 users in over 200 countries. Five market infrastructures of importance to the financial stability of the United Kingdom (CHAPS, CLS, CREST, LCH.Clearnet Ltd and TARGET) all use SWIFT. For this reason, even though SWIFT is not a payment or settlement system itself, its services are of systemic importance to the United Kingdom.

The Bank participates with other G10 central banks in the co-operative oversight of SWIFT, with the National Bank of Belgium as lead overseer (SWIFT's headquarters are in Belgium). The objective of overseers is to seek satisfaction that SWIFT appropriately manages risks to its operations that could otherwise threaten the smooth functioning of the international financial system.

Over the past year, further improvements have been made to the arrangements for co-operative oversight. Collective work by overseers to establish a more structured framework for the oversight and assessment of SWIFT's operational risk management has resulted in agreement on a set of High Level Expectations (HLEs). The National Bank of Belgium is due to publish more information on the HLEs in its June 2007 *Financial Stability Review*. Demonstrating compliance with the HLEs may prove an effective and efficient means for SWIFT to satisfy the interests of overseers.

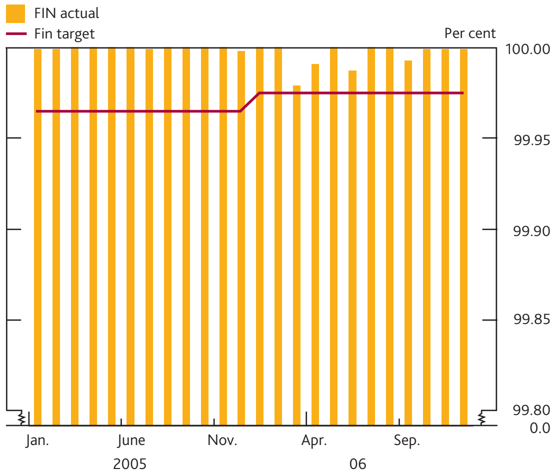
While the HLEs have been under development, the Bank has continued to base its oversight approach to SWIFT on Core Principles VII (operational risk) and X (governance).

Operational risk (Core Principle VII)

Availability of central infrastructure

SWIFT has continued to maintain strong availability of its critically important FIN messaging service (**Chart 20**). Although performance has been a little less strong than last year, the very high target availability (increased for 2006) of 99.974% has consistently been achieved and there have been no major incidents in UK payment systems resulting from SWIFT outages.[1]

Chart 20 Weighted availability of SWIFT FIN[a]



Source: SWIFT.

(a) Weighted availability is calculated by SWIFT. It takes into account the percentage of SWIFT users without access to SWIFT services and the length of time they are without this access.

Member connectivity

While the availability of SWIFT's central infrastructure is high, individual SWIFT users will experience lower SWIFT availability if they are unable to connect to SWIFT. As discussed in Section 2.1 (CHAPS) the Bank encourages users to consider the resilience of their connection to SWIFT. SWIFT guidelines set out the advantage of using two network providers to connect to SWIFT (**Table C**).

Table C Availability of member connections to SWIFT[a]

Dual-P availablility by number of providers (2006 Q4)

Dual providers?	Dual-P connections	Down time minutes	Availability
No	241	5742.03	99.9813%
Yes	226	512.10	99.9982%
Total	**467**	**6254**	**99.9895%**

Source: SWIFT. Table reproduced from: www.swift.com/index.cfm?item_id=5509.

(a) 'Dual-P connections' represents those customers that have two physical lines providing connectivity to SWIFT. 'Dual providers' is indicated as 'Yes' where the two lines are provided by different network providers and 'No' where both are provided by the same network provider.

Business continuity

SWIFT's 2006 test of its disaster recovery capability was significantly more effective than in 2005, indicating that past lessons had been learnt. SWIFT staff participating in the test were able to bring up the service and the majority of participating users were able to connect. The previous *Oversight Report* emphasised the importance of SWIFT improving communication with its users on the implications of its contingency plans for those users. SWIFT have since updated the *SWIFT User Handbook* emphasising the need for users to consider planning for message reconciliation following the (very unlikely) occurrence of a cold start. SWIFT has also

(1) This is a 'weighted availability' target calculated by SWIFT on the basis of the volume of traffic affected. Individual SWIFT users may experience lower availability.

announced that it will be facilitating tests of message reconciliation. The Bank welcomes such user testing and communication on business continuity issues, themes raised in the July 2006 F*inancial Stability Report* and Section 3.2 of this *Oversight Report*.

Information Security and Technology Risk
In addition to their focus on availability and business continuity, overseers have continued to investigate the management of Technology and Information Security risks by SWIFT. The SAS70 commissioned by SWIFT (which is available to all SWIFT users) is one means by which overseers have sought to understand whether Information Security risks are managed appropriately.

Projects
The SWIFTNet FIN Phase 2 project is progressing with pilot testing underway. One lesson learnt from problems with the earlier SWIFTNet FIN Phase 1 project is that SWIFT is making greater efforts to ensure non-SWIFT vendors that customers rely upon are ready. SWIFT publishes the status of each vendor on their website.

Governance (Core Principle X)
SWIFT appointed a new chairman in June. At the SWIFT annual conference, SIBOS, in October, he set out his challenges for SWIFT, including the need for SWIFT to better understand the needs of its users and for users to engage in the strategic and commercial decisions faced by SWIFT.

The Bank is supportive of this drive to enhance the engagement between SWIFT and its users. Effective governance provides incentives for management to pursue objectives in the interest of the system, its participants and the public more generally. Enhanced engagement between SWIFT and its users can only help in this regard.

SWIFT's 2010 strategy pursues further expansion. It is vital that investment in resilience continues to reflect its increasing systemic importance.

Chapter 3: Issues and priorities for future work

As illustrated here and in previous *Oversight Reports*, the Bank has found the Core Principles to be a useful device for organising oversight, motivating overseen payment systems to improve risk management and communicating the results of that work in a coherent fashion.

That the Bank has now published three *Oversight Reports*, all built around assessments against the Core Principles, illustrates their central role in ensuring a transparent approach to oversight. Such transparency plays an important role in promoting financial stability and, as described in Section 3.1, is an area where progress is being made. However, the Core Principles are static in content and this can create a gap between the benchmark which they represent and the risk environment facing payment systems, as well as advances in best practice and structural changes in the payments industry. Moreover, the Core Principles do not take account of interlinkages between payment systems and the risks they give rise to.

Considerable progress has been made in the United Kingdom in meeting the Core Principles and there is a growing incidence of full observance. This is encouraging but raises the question of whether there is more that needs to be done, in particular in relation to the most systemically significant systems.

To help answer that question the Bank has developed the Oversight Risk Framework described in Chapter 1. The Framework complements the Core Principles. And where costs can be shown to be proportionate, it also provides scope to push for implementation of controls and a degree of resiliency which goes beyond that required by the Core Principles. It enables the Bank to focus on areas of the payments landscape where risks to the Bank's oversight and financial stability objectives are greatest and warrant mitigation. And because of the consistency of methodology provided, the Framework also enables risks to be considered on a thematic basis through time, moving the Bank away from a system by system approach and allowing more cross system analysis.

This chapter focuses on some of the thematic work that has arisen as a result of applying the Oversight Risk Framework. A particular focus has been on the growing importance of business continuity planning and testing of contingency arrangements. This area, where the Bank would like to see further action by the industry, is explored in Section 3.2.

Through its consistency of methodology, the Framework enables interlinkages between payment systems to be assessed in terms of their risks to financial stability. These interlinkages, which can arise domestically and internationally, magnify the impact of risk events and hence need to be captured in testing of contingency arrangements, in particular through better cross-system testing (Section 3.2).

Equally, the trend towards consolidation in the financial sector and emergence of large complex financial institutions has blurred the boundaries between these institutions and infrastructure, making it harder to manage risks to financial stability by focusing solely on the latter. It also means member-level operational problems within one payment system can be propagated to a range of other payment systems. These aspects of banks as users of payment systems, and the risks to financial stability that gives rise to, are explored in Section 3.3.

A further area where the content of the Core Principles falls short is in relation to the structural trend towards separation of payment schemes from infrastructure providers. As noted in the previous *Oversight Report* such separation gives rise to business risk, an aspect of the risk environment which the Bank has been careful to include within the Oversight Risk Framework. The Bank's assessment of business risk within UK payment systems is discussed in Section 3.4.

Section 3.5 looks forward to the potential implications of future consolidation between payment systems and strengthening interlinkages.

3.1 Transparency

The previous *Oversight Report* acknowledged the importance of transparency as a tool for promoting financial stability. It was suggested that an extension to or revision of the Core Principles might enhance good transparency practices: (i) by recommending that a central bank should consider disclosing its Core Principles assessments of systemically important payment systems; and (ii) by recommending that a system operator should disclose information on the degree of their systems' compliance with the Core Principles. While no such changes to the Core Principles have been proposed, recent progress has been made by central banks in enhancing transparency practices. These developments are discussed below.

Public disclosure by central banks

On 30 November 2006 the Banque de France published its first report on 'Oversight of Payment and Transfer Systems',[1] containing its assessment of the compliance with the relevant Core Principles and CPSS-IOSCO recommendations of the five major domestic payment, clearing and settlement systems it oversees.[2] This is a welcome development which is likely to promote awareness and understanding among users of potential risks arising in French payment systems, improving market discipline. Ultimately this move has the potential to strengthen public confidence in the payment systems covered in the report. In addition, the enhanced transparency improves central bank accountability by providing a public benchmark. It is to be hoped that publication of oversight assessments will be adopted by other central banks in future.

Public disclosure by payment systems

The Board of Governors of the Federal Reserve System (the Board) recently revised its Policy on Payments System Risk[3] to, among other things, establish an expectation that operators of systemically important payment and settlement systems subject to the Board's authority disclose publicly their self-assessments against relevant standards.[4] These self-assessments should be reviewed and approved by a system's senior management and board of directors prior to publication. The Board expects initial self-assessments to be published by 31 December 2007 and updated where necessary following material changes to a system or its environment, with systems being expected to review their self-assessment every two years at a minimum to ensure continued accuracy.

Importantly the Board intends to review the published self-assessments of systems under their authority and, where necessary, provide feedback on them to system operators.[5] Where it materially disagrees with the content of a self-assessment its concerns will, where appropriate, be communicated to the system's senior management and possibly the system's board of directors, as appropriate. The Federal Reserve may also discuss any concerns with other relevant authorities.

The enhanced disclosure that will result from this policy change is greatly to be welcomed as a measure that will assist users, potential users and the public in evaluating the risks arising from the payment systems involved. In addition the Board's statement that where it does not have exclusive authority over a systemically important system it will encourage the relevant authorities to promote self-assessments by systemically important systems, gives hope that in future disclosure of self-assessments by systemically important payment systems of international relevance will become more widespread.

Both examples of enhanced disclosure highlighted in this section can be expected to have a positive impact on UK financial stability by enabling financial institutions operating in the United Kingdom to more effectively manage risks arising from their participation in the payment systems in question.

3.2 Business continuity

The broad message to emerge from Chapter 2 is one of UK payment systems remaining inherently robust. This is apparent if payment systems in the United Kingdom are assessed against the Core Principles or through the Bank's Oversight Risk Framework. It is also a continuation of the themes identified in the previous two *Oversight Reports*. As a result, oversight has increasingly focused on mitigation of low likelihood, high impact risk events, which give rise to scenarios in which contingency arrangements will be invoked.

Those low likelihoods reflect the nature of the risk events themselves. They also reflect the quality of risk controls and contingency arrangements established by payment systems to ensure continued smooth processing during stressed conditions. To have confidence in the quality of those controls and arrangements, they need to be shown to be comprehensive with respect to a dynamic risk environment, commensurate with the systemic significance of the payment system in question and, perhaps most importantly, tested regularly in order to provide assurances that they will operate as expected in a stressed scenario.

A useful method of ensuring the set of risk controls and procedures employed remains commensurate to the role of payment systems in the wider economy and to the risk environment is to benchmark controls against recognised best practice. In the United Kingdom, the 2005 Tripartite Resilience Benchmarking Project showed that most UK payment systems compared favourably to best practice within the wider financial services industry. This was a positive finding. The results also highlighted the importance of ensuring that business continuity plans and contingency arrangements do not conflict between systems and do not make unrealistic assumptions regarding the responses of critical suppliers. This is something which the Bank has encouraged payment system operators to review during 2006. One way in which the industry has met this challenge has been

(1) The report (in English) can be found at: www.banquedefrance.fr/gb/sys_mone_fin/telechar/rapports/2006/rs2006.pdf.
(2) The five systems are TBF, PNS, SIT, RGV2 and LCH.Clearnet SA.
(3) For full details see: www.federalreserve.gov/boarddocs/press/other/2007/20070112/default.htm.
(4) The Core Principles are the relevant standards against which payment systems should conduct their self-assessment. For CCPs and SSSs the relevant CPSS-IOSCO Recommendations should be used.
(5) As indicated in the Board's policy, any review of an assessment by the Federal Reserve should not be viewed as an approval or guarantee of the accuracy of a system's self-assessment, and the contents of any review would be subject to the Board's rules regarding disclosure of confidential supervisory information.

through clearer articulation of targeted service resumption times in the event of a major operational disruption.

Testing is another essential element in enhancing the systems' ability to operate effectively in a crisis, and the Bank has placed considerable emphasis on the importance of regular and well-planned testing. The Bank welcomed participation of a number of payment systems, alongside their users, in the FSA-led Tripartite Market Wide Exercise (MWE), which ran over a period of six weeks in late 2006 and was based around a scenario of increasing staff absenteeism caused by a flu pandemic.

The results of the MWE, which involved participants from across the financial services industry, suggested UK payment systems could accommodate significant staff absences without adversely impacting on core payment processing and settlement services. Given their importance to the financial services industry and the wider economy, this was again a positive finding.

Interlinkages

The MWE also highlighted the need to ensure clear cross-system co-ordination and communication of responses to an infrastructure shock, because of the way a shock can affect a range of different systems.

Dependence of different systems on common service providers, including SWIFT, is one way in which a shock can impact across systems. But individual systems are also directly linked. For example, in the United Kingdom:

- LCH depends on CHAPS for members to make their margin payments;
- LCH also depends on CREST to settle equity and gilt trades for which it acts as central counterparty; and
- CREST and CHAPS members use a single 'pot' of liquidity to fund payments in the two systems.

It was because of the liquidity pot shared between CREST and CHAPS (via RTGS) that problems encountered following CREST's migration to a new settlement engine during 2006 disrupted operation of CHAPS, manifest in a number of payment cut-off extensions. On 29 August the delayed settlement of DBV transactions in CREST took CHAPS member banks very close to the latest time at which the system could close and still leave a sufficient period of time for members to complete their bulk reconciliation and accounting processes. Failure to complete these processes could have disrupted the distribution of liquidity across the financial system the following day.

Interlinkages can also exist between systems operating in different currency areas, including via CLS. And banks can trade with each other, exchanging cash or liquid assets denominated in one currency for liquidity in another. Such activity is core to how banks manage their liquidity. By disrupting such transfers, disruption to the infrastructure supporting systems in one currency could have knock-on effects on systems in other currencies.

Cross-system testing

Over the coming year, the Bank intends to assess more thoroughly the risks from domestic and international interlinkages. It also expects the payments industry to address the co-ordination and communication issues needed to mitigate cross-system disruptions. This can be achieved most obviously through comprehensive cross-system testing, incorporating scenarios based on disruption to interlinkages arising through shared infrastructure. For example, as noted in Chapter 2, the Bank is keen for CHAPS Co to work with its members to undertake testing of contingency arrangements to be used in the event of a member suffering a SWIFT connectivity problem. But further benefit could be derived from extending that testing to capture other payment systems with dependencies on SWIFT, such as CREST and CLS. Similarly, cross-system testing based around scenarios where RTGS is unavailable for a prolonged period of time or the processing day is severely curtailed would provide valuable information on the ability of the industry to minimise the impact arising from a large common operational shock. As noted previously by the Bank, any such testing should be conducted with the full involvement of users of the systems involved.(1)

3.3 Banks as users of payment systems

Operational problems are not an issue only at the level of systems. Operational problems within member firms may spill over and potentially impact on other members of the systems which the bank participates in. Through their own risk management practices, shaped by the rules and codes of conduct governing payment systems, members can act to minimise the likelihood of problems which may arise within their own internal systems spilling over. If payment systems are seen as networks which span the central infrastructure, members and users, good risk management by members can minimise the likelihood of risks crystallising at a member level having an adverse impact on the entire network.

This is particularly important for institutions which settle payments and securities transactions on behalf of other banks, ie for providers of correspondent banking and custody services. In a way, these service providers are themselves key

(1) Bank of England *Financial Stability Review*, July 2006, pages 60–61.

components of the financial infrastructure. In some cases their operations are sufficiently large that they give rise to the same kind of 'single point of failure' concerns as the formal systems themselves: much like the systems, they are themselves key nodes within the payment industry network.

The United Kingdom's payment and settlement systems are characterised by a high degree of correspondent banking activity (they are highly 'tiered'): a relatively high proportion of payments in CHAPS and cash legs in CREST originate with banks which settle through correspondents.(1)

It is important that institutions which choose to operate via correspondents and custodians manage the risk appropriately, including with regard to their contingency arrangements. In choosing a correspondent/custodian, operational robustness is one of the key concerns, so market forces are an important constraint on service providers. But as argued in the *2005 Oversight Report* (page 51), it is important that the authorities responsible for the soundness of banks and of systems work together to ensure that risks in this general area are tackled in a joined-up manner.

Money Market Reform

The risks from the highly tiered nature of the United Kingdom's large-value payment systems have been mitigated to some extent by the introduction of standing facilities as part of the Bank's recent reform of the sterling money markets (MMR).(2) A wide range of banks which are not currently CHAPS Sterling members or CREST settlement banks have chosen to have access to standing facilities at the Bank. This ensures that, subject to being able to post Bank of England eligible collateral, they have access to liquidity in the event that an operational problem affected their CHAPS/CREST settlement bank. Additionally, the standing lending facility enables these institutions to access liquidity during periods of stressed market conditions, when settlement banks may be less willing to extend intraday funds.

3.4 Business risk in payment systems

The previous *Oversight Report* discussed the challenge posed by business risk — the risk that a payment system or any of its components cannot be maintained as a going concern in the face of adverse financial shocks.

For the UK payments industry, business risk (which is not covered by the Core Principles) was shown to be of relevance primarily because of the incidence of payment schemes operating separately from payment infrastructure providers. During 2006 the Bank has refined its assessment of business risk in UK payment systems, through the identification of relevant controls, coupled with application of the Bank's Oversight Risk Framework.

Controls for business risk

A key *ex ante* control for business risk concerns the financial robustness of the relevant system component, both in terms of the buffers available to withstand financial shocks (ie profitability and the capital base) but also the degree of implicit support which might be forthcoming.

The size of such financial buffers may be larger for a consolidated payment system component occupying a dominant market position, one positive aspect of consolidation of infrastructure (Section 3.5). Regarding implicit support, this can be thought of as a function of two factors: the willingness and the ability of shareholders to provide financial assisstance.

Where payment system components are owned by their users, willingness to provide support should be reasonably high. To better understand why, consider the impact of shareholders not providing financial support; were the system component to fail as a result of that lack of support, those same shareholders would suffer a further adverse impact at the customer level, through reputational or confidence effects. These potential 'second-round' effects, which may be particularly large in relation to a consolidated system component for which no feasible alternative exists, provide an incentive for user-owners to offer a significant degree of implicit support. That incentive also partly reflects the small balance sheet size of such components in relation to the capital base of their owners, meaning the ability of owners to provide support is typically large.

Cutting against these incentives, if consolidation of payment system components creates a broader ownership base, willingness to provide implicit support may be reduced if it becomes harder to co-ordinate shareholders and incentives to free-ride grow. Similarly, consolidation may also increase the balance sheet size of system components. Whilst this might reduce the ability of some user-owners to provide support, consolidated infrastructures are likely to remain small in relation to the balance sheet size of the largest user-owners.

In terms of *ex post* controls, the Bank has identified step-in rights held by the payment scheme over the relevant system component as potentially being useful in mitigating the disruptive impact of a business risk event. These enable the payment scheme to take responsibility for the operation of the system component in the event of some pre-determined trigger event occurring — for example the degradation of

(1) For example, survey evidence has suggested more than half of payments (by value) settled in CHAPS Sterling represent payments made on behalf of customer banks. The previous *Oversight Report* (pages 10–11) discussed work by the Bank considering the degree of and risks arising from tiering in UK payment systems.
(2) The previous *Oversight Report* discussed these risks in detail. Improvements to operational risk management practices adopted by CHAPS members help to reduce the likelihood of such problems. And improvements to operational risk management within non-CHAPS members help to reduce their impact. However, the Bank still wishes to see a broadening of the direct membership of CHAPS.

service levels below some predefined benchmark or the infrastructure suffering some significant adverse financial shock. Their existence can provide scheme members (ie users) with some degree of assurance that payments will continue to be processed smoothly during what is likely to be a period of more general uncertainty. Moreover, their existence may provide an incentive for the system component to work to avoid a situation where management control of the company is denied.

Business risk within the Oversight Risk Framework

Initial results from application of the Bank's Oversight Risk Framework have indicated that business risk is of less significance than either operational or settlement risk in UK payment systems. This is primarily a reflection of how payment system components in the United Kingdom are predominantly user-owned, engendering a high degree of implicit support. Consequently, the likelihood of business risk crystallising is low, and the Bank is not currently seeking further risk mitigation in this area. But because ownership structures could change, affecting the degree of implicit support, the Bank will continue to monitor business risk in payment systems and, if necessary, encourag its mitigation.

3.5 Consolidation of infrastructure

Section 2.1 and **Box 3** noted how the introduction of a new Faster Payments service could potentially act as a catalyst for consolidation of UK payment infrastructure, as a response to rising per transaction costs associated with processing payments on a RTGS basis.

One model of consolidation could involve rationalising existing payment processing and settlement for clean payment systems on to a single infrastructure. Although it remains a nebulous concept, a single infrastructure supporting both real time gross and 'quick' (eg same-day) deferred net settlement could represent something approaching a UK payments backbone. An attraction for banks (as owners) could be the ability to rationalise investment in shared payment infrastructure and streamline governance arrangements. For banks as users, one attraction of a consolidated infrastructure could be the opportunity to rationalise internal payment processing and accounting systems, potentially built around a single interface with the consolidated infrastructure. Additionally, it could enable the RTGS component to be designed with some liquidity saving features, further benefiting banks as users.

The emergence of any such backbone would present the Bankwith a new set of risks to assess, along with some potential benefits. Most obviously, the concentration of payments being processed or settled across a single infrastructure would increase. This would represent a greater degree of interdependency between systems, potentially creating a single point of failure which could disrupt a wider range of payment types. A consolidated infrastructure could make it less attractive for banks to invest in provision of feasible substitutes to reduce the impact of risks arising at an infrastructure level.

For the overseer, that suggests a need to minimise the likelihood of any risks crystallising in the first place, by encouraging investment to enhance resiliency and recovery capacity. Concentration of payments on to a consolidated infrastructure would rationalise the range of payment infrastructures user-owners were required to invest in and deliver economies of scale in processing. These effects could provide incentives to invest in enhancing the resiliency of the consolidated infrastructure. Consolidation could also increase the willingness of user-owners to provide financial support, mitigating the likelihood of business risks crystallising.

Over the next year the Bank intends to participate in debate regarding the future of UK payment infrastructure, not only in its role as overseer but also through its role as the provider of RTGS services to UK payment systems.

Glossary of terms

Business risk
The risk that the payment system or any of its components — eg an infrastructure provider serving it — cannot be maintained as a going concern in the face of adverse financial shocks.

Central counterparty
An entity that interposes itself between counterparties to contracts traded in one or more financial markets, becoming the buyer to every seller and the seller to every buyer.

Core Principles
The ten Core Principles for Systemically Important Payment Systems provide a set of minimum standards for risk management in systemically important payment systems.

Deferred net settlement
Under deferred net settlement, a payment system releases details of payments to the receiving bank prior to interbank settlement.

Designation
Designation under the SFD/FMIRs provides additional assurance of the enforceability of a system's default arrangements.

Exposure
The maximum loss that might be incurred if assets or off balance sheet positions are realised, or if a counterparty (or group of connected counterparties) fail to meet their financial obligations.

Financial Markets and Insolvency (Settlement Finality) Regulations
These Regulations — 1999 (SI 1999/2979) (FMIRs) — implement into UK law the EU Settlement Finality Directive.

Governance
Corporate governance is the method by which an organisation is directed, administered or controlled. The corporate governance structure specifies the distribution of rights and responsibilities of the board, managers, any shareholders and other stakeholders, and spells out the rules and procedures for making decisions on organisational affairs.

Legal risk
The risk that unexpected interpretation of the law, or legal uncertainty, leaves payment system participants and users with unforeseen financial exposures and possible losses.

Operational risk
The risk that a system operator or core infrastructure provider to the system is operationally unable to process or settle payments as intended.

Principal risk
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.

Settlement Finality Directive
The EU Directive on Settlement Finality in Payment and Securities Settlement Systems (Directive 98/26/EC); implemented into UK law by the FMIRs.

Settlement risk
The risk that a participant in a system cannot or does not meet its financial obligations when, under the rules of the system, they fall due, or that another institution that facilitates the settlement of those obligations — such as the settlement agent — becomes insolvent.

Abbreviations

APACS – Association for Payment Clearing Services
ATM – Automated teller machine
BABs – BACS Approved Bureaux
BCP – Business Continuity Planning
BPSL – BACS Payment Schemes Ltd
BIS – Bank for International Settlements
C&CC – Cheque and Credit Clearings
C&CCC – Cheque and Credit Clearing Company Ltd
CCP – Central counterparty
CHAPS – Clearing House Automated Payment System
CHAPSCo – CHAPS Clearing Company Ltd
CLS – Continuous Linked Settlement
CPSS – Committee on Payment and Settlement Systems
CRESTCo – CREST Company Ltd
CSD – Centralised Securities Depository
CWG – Cheque Working Group
DNS – Deferred Net Settlement
DTCC – Depository Trust & Clearing Corporation
DvP – Delivery versus Payment
ECB – European Central Bank
ESA – Euroclear SA/NV
ETS – Enhanced Transmission Service
FMIRs – Financial Markets and Insolvency (Settlement Finality) Regulations
FSA – Financial Services Authority
FSMA – Financial Services and Markets Act
FTS – Funds Transfer Sharing
GDP – Gross domestic product
HLEs – High Level Expectations
HST – High speed transmission
IBDE – Interbank Data Exchange
IPL – Immediate Payments Limited
IOSCO – International Organization of Securities Commissions
I/O swap – Inside/Outside swap
LFCA – Liquidity Funding and Collateralisation Agreement
MMR – Money Market Reform
MoU – Memorandum/memoranda of Understanding
MWE – Market Wide Exercise
NMC – Network Members Council
OFT – Office of Fair Trading
OMO – Open market operation
PSD – Payment Services Directive
PSTF – Payment Systems Task Force
PPS – Protected Payments System
RCH – Recognised Clearing House
RSSS – Recommendations for Securities Settlement Systems
RTGS – Real-Time Gross Settlement
SAS70 – Statement on Auditing Standards number 70
SEPA – Single Euro Payments Area
SFD – Settlement Finality Directive
SLA – Service level agreement
SSE – Single Settlement Engine
SSLR – Sterling Stock Liquidity Regime
STS – SWIFTNet transmission service
SWIFT – Society for Worldwide Interbank Financial Telecommunication
TARGET – Trans-European Automated Real-Time Gross Settlement Express Transfer

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