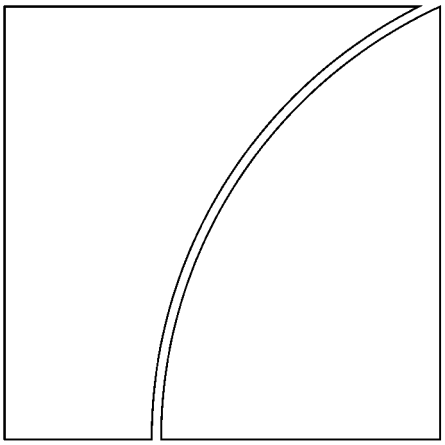
Committee on Payment and Settlement Systems



The role of central bank money in payment systems

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Foreword

Contemporary monetary systems are based on the mutually reinforcing roles of central bank money and commercial bank monies. What makes a currency unique in character and distinct from other currencies is that its different forms (central bank money and commercial bank monies) are used interchangeably by the public in making payments, not least because they are convertible at par. Central bank money plays a key role in payment arrangements, as it has proved safe and efficient to have a central reference of value with which all other forms of the currency maintain this par convertibility. This role is long-established and, for the most part, uncontroversial.

Nevertheless, as explained in this report, the role of central bank money in payment systems raises a number of questions. Developed economies have complex and interdependent payment arrangements in which there is a combination of competition and cooperation between the many institutions involved. The use of central bank money is thus part of the underlying issue of the balance between the services provided by central banks and those provided by commercial banks in the payment system. And given the widespread and fundamental changes that have occurred over the past decade or so, and which continue today, it is useful to consider whether an appropriate balance is being maintained and how the composite use of both monies can best be achieved.

This report therefore looks at a range of practical policy questions. For example, which institutions should have accounts at the central bank? What services should central banks provide to meet the needs of account holders? When should central banks insist that payment or securities settlement systems settle in central bank money; or - when this is not practicable - what sufficiently safe alternatives exist to mitigate credit and liquidity risks? What are the possible benefits and risks of the concentration of payments through a few large banks, and how might central banks approach this issue? And to what extent can the supply of central bank money, normally confined to the area of jurisdiction of the central bank, meet the demands of global players active in multiple currencies?

The report shows that there is much common ground among CPSS central banks in their objectives as well as in the main tenets of their policy concerning the role of central bank money in payment systems. These collective views and practices are presented in the form of 10 propositions. At the same time, however, there are often differences when it comes to the implementation of policy. In setting out both the similarities and the differences, the report is not normative but rather descriptive of central bank policies and the motivations underlying the chosen policies. It aims to provide a useful factual base and a strong analytical framework that will raise awareness and stimulate debate on these key matters.

I would like to pay special tribute to a number of people who dedicated their time, talent and energy to drafting this report. First, to Shuhei Aoki (Bank of Japan), who contributed countless hours to coordinating this project from start to finish. Bringing the work to fruition also relied on the enthusiasm and commitment of Robert Lindley (Bank for International Settlements/CPSS Secretariat), Masayuki Mizuno (Bank of Japan), Travis Nesmith (Board of Governors of the Federal Reserve System), Ignacio Terol (European Central Bank) and Alastair Wilson (Bank of England). Discussions held by the Committee and its working group (the members of which are listed in Annex 6) provided inspiration and numerous helpful contributions to the project.

Tommaso Padoa-Schioppa, Chairman
Committee on Payment and Settlement Systems

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Executive summary and introduction

Central bank money plays a key role in payment systems. This report analyses that role and looks at how it may change as a result of current or possible future developments. It develops an analytical framework that permits a better understanding of how central banks formulate policy in this important area.

The coexistence of central and commercial bank monies: multiple issuers, one currency

Money is fundamental to the functioning of market economies inasmuch as these are based on exchange and credit. In a market economy, any two economic agents are free to agree on the means of payment to be used to settle a transaction.[1] Acceptance of any form of money will, however, depend on the receiver's confidence that, subsequently, a third party will accept that money in trade. Fiat money is worth nothing without the trust of a community behind it. Manifestation of this trust is exemplified by the use of banknotes. Being intrinsically worthless pieces of paper that everyone accepts from a stranger in exchange for valuable goods and services, banknotes testify to the presence of certain bonds of confidence that tie together the members of a society.

Today, any widely used form of money is denominated in a given currency. By sharing a currency, the individuals of a community have in common a measure of economic value, a means to store value, and a set of instruments and procedures to transfer this value. However, since the value of money lies in trust, there can be no absolute guarantee that confidence in the currency can be preserved over time. It may be shaken by a monetary crisis or by the malfunctioning of the payment system. As a result, maintaining trust in the currency, and thus facilitating its circulation, becomes a major public interest. The central bank is, in most countries, the institution designated to pursue this public interest.

In pursuit of its task, the central bank issues its own liabilities for use as money (central bank money). But the central bank is not the only issuer of money in an economy. The multiplicity both of issuers of money and of payment mechanisms is a common feature in all developed economies. Commercial banks are the other primary issuers, their liabilities (ie commercial bank money) representing in fact most of the stock of money.[2] A healthy, competitive commercial banking market is seen as an essential element of an efficient and effective economy.

Thus central bank and commercial bank money coexist in a modern economy. Confidence in commercial bank money lies in the ability of commercial banks to convert their sight liabilities into the money of another commercial bank and/or into central bank money upon demand of their clients. In turn, confidence in central bank money rests in the ability of the central bank to maintain the value of the stock of currency as a whole (ie not only of the small portion it issues directly), or its inverse, to maintain price stability.

Money therefore represents an obligation of different issuers, and consumers regularly exhibit preferences for holding and using different forms of money, which often vary for different types of transactions. Yet the perception of the public is such that it uses the various forms of money interchangeably so long as they are denominated in the same currency. Two factors explain this: first, the existence of a form of money (central bank money) which has the support of public authorities and, second, convertibility of other monies into central bank money at par value. The combination of these two factors gives rise to the currency's single character, the certainty that "one dollar is one dollar", whatever form it takes (whether central or commercial bank money). And this "singleness" seems to be a necessary (but by itself not sufficient) condition for a currency to effectively become "the" measure of economic value, or the unit of account, shared by members of a modern economy, with the associated advantages of efficiency and safety in trade.

All central banks represented in the CPSS believe that the composite of central and commercial bank money is an essential feature of the monetary system and should be preserved. A multiplicity of issuers of money preserves the advantages of competition in providing innovative and efficient means

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[1] This report analyses the concepts of money and means of payment from an economic perspective and does not try to provide legal definitions.

[2] In some economies, non-banks also issue private money in more limited amounts.

of payment and, indeed, in providing financial services generally. The regulated or licensed character of these issuers (commercial banks) aims at promoting their solvency and liquidity in order to preserve confidence in the currency. And the use of central bank money in payment systems puts the value of banks' liabilities to the test every day by checking their convertibility into the defined unit of value.

This policy position implies a rejection of the two extreme arrangements of monobanking, where the central bank acts as the sole issuer of money, and free banking, where commercial banks provide all the money required by the economy. Neither of these corner solutions has proven to be sufficiently stable or efficient to endure.

The pivotal role of central bank money in payment systems

To facilitate convertibility between different forms of money, central banks support the existence of at least one payment system for their own currency that is widely accessible to banks. Payment systems play a fundamental role in the economy by providing a range of mechanisms through which transactions can be easily settled. As such, banknotes are part of this broad notion of payment systems. In spite of the expanding role of its various substitutes, the banknote is still a fundamental payment instrument in economic life. Yet this report focuses on a narrower concept whereby a payment system is a defined set of instruments, procedures and rules for the transfer of funds from one bank to another. In these systems, banks hold funds at a common agent (referred to in the report as "settlement institution"). Payments between these banks are made by exchanging the liabilities of this settlement institution (the "settlement asset"). Deposits at the settlement institution and the credit of the settlement institution (when available) are both accepted as money by all the participants in the system. "Payment systems" include payment mechanisms used by securities settlement systems (SSSs), whether the payment mechanism is "embedded" within the SSS or external to it. This report does not distinguish between the role central bank money plays in embedded mechanisms and in external payment systems, and the analysis which follows is relevant to both.

In practice, most - although by no means all - payment systems settle in central bank money.[3] In other words, the settlement institution is generally the central bank. This role is consistent with the monetary order described earlier, whereby a commercial bank honours its sight liabilities by converting them into central bank money if their clients demand it. It also reflects the layered architecture of financial systems, whereby private individuals and non-financial businesses hold (part of) their liquidity in banks, and banks in turn hold (part of) their liquidity in the central bank.

The choice of settlement asset in a system - particularly in a system handling large values - is important because of the exposures that can arise between the settlement institution and the participants in the system and because of the crucial operational role the settlement institution plays in the system. The widespread use of central bank money as a settlement asset reflects its overall qualities of safety, availability, efficiency, neutrality and finality.[4] Most importantly, failure of the settlement institution can have critical systemic consequences and the use of the central bank as settlement institution minimises the risk of this occurring. CPSS central banks' common policy in this area is set out in *Core principles for systemically important payment systems*[5], ("Core Principles") which states that the settlement asset in systemically important systems should preferably be a claim on the central bank or, if other assets are used, that they should carry little or no credit and liquidity risk. A similar policy is contained in the report on *Recommendations for securities settlement systems*,[6] ("SSS recommendations") which says that the assets used to settle the ultimate payment obligations from securities transactions should carry little or no credit or liquidity risk and that, if central bank money is not used, steps must be taken to protect members of the central securities depository from potential losses and liquidity pressures arising from the failure of the settlement institution whose assets are used.

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[3] For more information, see Annex 3, Table C.

[4] These features are prominent in central bank money but none is exclusive to central bank money.

[5] *Core principles for systemically important payment systems*, BIS, January 2001.

[6] *Recommendations for securities settlement systems*, BIS, November 2001.

In an era of financial globalisation, however, using the central bank as the settlement institution may not always be practical. Global players, active in multiple currencies, are confronted with the essential nature of the central bank as a domestic monetary authority. The supply of central bank money and central bank services is normally confined within the area of jurisdiction of the central bank, so no central bank alone can cater for the needs of these global players in full. Central banks can address some of the consequences of globalisation through mutual cooperation. For example, in the mid-1990s central banks expressed their preference for a market solution to address the need to reduce principal risk in foreign exchange settlement.[7] Continuous Linked Settlement (CLS), the infrastructure adopted by the market, was supported by the international central banking community, and in 2002 the first currencies were authorised by the relevant central banks for inclusion as eligible currencies in the system. CLS Bank, a private utility which meets the international norms for risk management laid out by the G10 Governors, is the settlement institution for CLS - ie settlement is not in central bank money. However, all payments to and from CLS are made through the issuing central bank, so central bank money retains a necessary role, pivotal but not central, in the settlement of foreign exchange transactions in CLS. Similar issues arise with other systems, for example the International Central Securities Depositories (ICSDs) Euroclear and Clearstream Luxembourg ("Clearstream"), which service international markets and provide settlement in multiple currencies in commercial bank money.

The pivotal role of central bank money in payment systems must be balanced against the business decision of any commercial bank to use the payment services of another commercial bank rather than those of the central bank. As a result of these decisions, most interbank payment systems have a greater or lesser degree of tiering (ie several layers of settlement). Thus (and assuming that the settlement institution is the central bank), while some banks are direct participants in a payment system and settle in central bank money (top-tier banks), others (lower-tier banks) may instead use the services of a top-tier bank to make and receive payments from other banks. This is standard practice in international banking, with the widespread use of correspondent banks to make cross-border payments. It is also the practice in most domestic banking arrangements where, for example, a (typically) smaller bank may be a customer of a (typically) larger bank. As a result, a payment from one bank to another may involve settlement in commercial bank money only (between two lower-tier banks using the same top-tier bank), or in central bank money only (between two top-tier banks), or in a combination of central and commercial bank money (eg between two lower-tier banks which do not use the same top-tier bank).

Thus, while central bank money plays a pivotal role in the economy, no central bank sees the use of central bank money as an end in itself. An increase in the amount of central bank money used for payments does not necessarily indicate greater economic welfare. Rather, central banks' interest lies primarily in the use of central bank money at the apex of large-value payment systems, as a complement to the use of commercial bank money in such systems.

Access to central bank money

While central banks encourage or require the use of central bank money in systemically important payment systems, they limit access to it for other purposes. One form of central bank money - namely banknotes - is, of course, universally available. However, central bank accounts are typically available only to a limited range of entities, mainly banks. This reflects the fact that while central bank money plays a key role as a settlement asset in payment systems, central banks do not in general want to compete with commercial banks in providing banking services to the public. Because of this, central banks typically open accounts only where there are good public policy reasons for doing so, for example where the use of central bank money helps to eliminate exposures arising within the payment process that could give rise to systemic risk.

Even if commercial banks are central banks' core customers, most central banks do have some other account holders. In general these other account holders are non-commercial entities - for example, the government, foreign central banks or international financial institutions such as the IMF. But most

[7] The risk of paying out one currency without receiving the other currency in return. See *Settlement risk in foreign exchange transactions*, BIS, March 1996.

central banks also offer accounts to supervised or licensed commercial financial institutions other than banks - for example, securities firms or clearing houses - mostly in cases where such institutions are also directly involved in payment or securities settlement systems. And some go further and offer accounts to a small range of non-financial institutions.

All central banks represented in the CPSS provide access to a form of intraday credit facility to some of their account holders, and in particular to banks. Those which undertake the privileges and obligations of participation in the payment system generally find it valuable to have access to some form of credit in order to use the system efficiently. Intraday credit from the central bank is generally highly valued because it can be used to redeem any obligation, may be provided in large amounts (although collateral is generally required), and is provided, in most cases, at quasi-zero price. As a result, when central banks offer accounts with no credit availability, there may be little demand.

Variations in policies

However, while there are broad areas of common ground as set out above, practical distinctions exist in the approach of central banks to the use of central bank money. For example, there are some variations in central banks' policies on which systems should be required, encouraged or allowed to settle in central bank money, particularly in relation to lower-value systems.

There is also some diversity in the approach to which institutions are allowed to maintain settlement accounts. Some central banks have broader policies than others. For example, while some CPSS central banks are prepared in certain circumstances to permit a wide range of non-bank financial institutions access to accounts and credit (eg the Bank of Japan, the Bank of England and the Bank of Canada), others limit access primarily to deposit-taking institutions (eg the Federal Reserve and the Hong Kong Monetary Authority). And while some are prepared to allow non-resident institutions to open and operate accounts on a remote basis[8] (eg the Bank of England and the Swiss National Bank), a significant number are not, or will only do so in a limited number of well-defined cases. Finally, while most central banks adopt a permissive approach to institutions opening settlement accounts (specifying which institutions may, rather than must, open accounts), a few require or strongly encourage all banks to do so (eg the Hong Kong Monetary Authority).

Current and prospective developments

The complexity in the pattern of use of central bank money is increasing. Financial markets as a whole are affected by the powerful forces of technological change, deregulation and globalisation. Payment arrangements are affected by these forces.

Some developments have already had significant effects on the role of central bank money. While the role of the central bank as settlement institution is a long-standing one, in many cases this role only required the central bank to settle the relatively small net positions of commercial banks resulting from a netting procedure. Moreover, this occurred only once each day, at the end of the day. But with the introduction of newer, safer systems to handle the substantially increased payment system values, and in particular with the widespread adoption of real-time gross settlement (RTGS), where each payment is settled in real time throughout the day, central banks and central bank money have come to take on a much wider and more active role. Because the settlement of each payment involves a direct transfer of the settlement asset, RTGS systems require substantially more of the asset to ensure smooth payment flows. To enable this, most central banks provide intraday credit to banks participating in these systems in quantities which in some cases dwarf the banks' overnight balances or their overnight borrowing from the central bank.

Also relevant to the use of central bank money in payment systems is the possibility of *significant concentrations of payment activities* and associated exposures within individual banks. Indeed, a few banks process very high payment values - in some cases similar to those of large-value payment systems. Such concentrations may arise for various reasons, such as consolidation between banks, specialisation by certain banks in correspondent banking (an area of banking that has grown relatively

[8] See the discussion on access to accounts by non-resident banks in Section 3.2.1.

rapidly because of an increase in cross-border payments), or changes in cost structures that encourage indirect rather than direct participation in payment systems. Significant concentrations of payments are of interest to central banks because of possible implications for risk and efficiency in the payment system. They may also indicate that central banks should provide more competitive settlement services. Finally, they may raise the question as to whether the scale of activity requires additional supervision from a payment system oversight perspective, and they may call into question the limitations on some central banks' supervisory authority over commercial banks that engage in systemically relevant payment activity.

The *increase in cross-border flows*, a result of capital liberalisation and financial globalisation, has important implications not only for correspondent banking but also for access to central bank accounts and credit. For example, the ICSDs, Euroclear and Clearstream, while processing the majority of their transactions in euros, have most of their participants located outside the euro area. If the Eurosystem were the settlement institution for the euro in these systems, it would need to facilitate remote access to accounts and credit.[9] Another example is the request, by a task force of large global banks, for central banks to facilitate access to intraday credit by broadening the range of eligible collateral to include a wider range of cash and securities located in other financial centres.

Further developments, while also having risk implications, are perhaps more relevant from the point of view of competition, market structure and efficiency. For example, there have been requests in some economies from non-bank financial institutions which are active in payments, or even from certain non-financial institutions, for direct *access to central bank accounts and payment systems*. There have also been requests for central banks to provide *new or improved services* that affect the way in which central bank money is used - services such as longer operating hours, interoperability between systems, liquidity saving mechanisms or even multicurrency functionalities.

Some key issues for central banks

The developments just described can impact on several key ongoing issues that central banks face when providing settlement services.

- Access: who should be allowed to have a settlement account at the central bank? Should access to settlement accounts be limited to core payment service providers, and in particular to banks? Alternatively, how might central banks' access policies adapt to cater for the emergence of new forms of payment service provider and the increasing values of payments accounted for by non-banks (particularly securities firms)? Should such institutions also have accounts? Which account holders should be allowed credit?
- Services: do the account-related services currently provided by central banks meet the needs of account holders and their customers? Should operating hours be longer? Does technology offer scope to enhance services, or the design of the payment systems to which they relate, so as to improve the safety and efficiency of the payment process? Are there principles that place clear limits on the services central banks should offer?
- Requirements: both the Core Principles and the SSS recommendations considered the question of when payment and settlement systems should be required to settle in central bank money, and when an alternative (high-quality) settlement asset might be acceptable. When should central banks insist on payment or securities settlement systems settling in central bank money? Where that is not practicable, what sufficiently "safe" alternatives are adequate to mitigate credit and liquidity risks?
- Concentration: as noted above, not all banks participate directly in payment systems - some make use instead of the correspondent services provided by other banks. This brings efficiencies, but may also lead to a concentration of payments through a few banks if there are only a relatively small number of direct participants or if certain direct participants

[9] For a definition and discussion of remote access, see Section 3.2.1.

specialise in providing correspondent services. What risks does such tiering cause and what might be done to mitigate them?[10]

Possible policy responses

While it would be hard at this stage to identify any strong or universal trend in these developments and the potential impact they may have on the key ongoing issues, it is nevertheless the case that they are already relevant for some central banks and may well become relevant for others in the near future. Many central banks have thus undertaken policy reviews.

Central banks need to consider both the costs and benefits of any policy change (or of the absence of policy change). If central banks decide that a policy response is warranted, all central banks have broadly similar tools at their disposal. Most directly, if desirable they can modify their access policy to allow new types of institutions as account holders. They can also alter the sorts of services that are available to account holders (eg whether credit is provided and if so under what terms) or alter the design of the payment systems they operate (eg change the technical means of access). More broadly, they can use their oversight responsibilities, where appropriate in conjunction with banking supervisors, to determine the standards applicable to payment systems and perhaps also to large commercial providers of payment services.

Conclusion

The complex matter of competition and cooperation between central banks and commercial banks is central to the topics examined in this report. Central and commercial bank monies are in many senses alternatives. Nevertheless, the chain of transactions that lies behind individual payments will often involve settlement in both central and commercial bank money. Moreover, the use of central bank money enhances the soundness and efficiency of the payment system as a whole. Consequently, users of commercial bank money benefit, directly or indirectly, from an externality generated by the use of central bank money in payment systems. The convention exists that central banks avoid competing with commercial banks in most of the payment services provided to the non-bank public. It is this convention that generates the dichotomy between banknotes, that are available to all, and central bank accounts, that are available only to some. At the same time, a symbiotic relationship exists by which, on the one side, commercial banks help to extend the use of the currency while not putting its stability at risk and, on the other side, the central bank provides them with privileged access to its credit and, where appropriate, to some form of safety net.

However, the delimitation of the roles of central banks and commercial banks is not an absolute one. In the provision of payment services to other banks an overlap exists. Banks may choose (and should generally be able to choose) between a central bank and a commercial bank to process their payments. As well as helping to promote a competitive banking system, this choice creates a healthy incentive for central banks to provide competitive services. Central banks try to avoid unfair competition in this area, for example by seeking to apply fair pricing policies.

This report does not attempt to set out a unique approach but instead shows the similarities and the variations in the policies of CPSS central banks. What has been made evident by history is that policy in this area is not static but must necessarily evolve with technological change and with changes in financial, political and legal structures. The role and functions of the central bank itself have in fact adapted over time, responding partly to change in the technology for making payments, and often adopting innovations originated in the private sector. For instance, in many countries paper money or account money represented a revolution in the technology for making payments that was initiated by private banks.

The CPSS central banks share the conviction that the composite of central and commercial bank money, convertible at par, is essential to the safety and efficiency of the financial system and should remain the basis of the singleness of the currency. In other words, central banks would accept neither

[10] The effects of consolidation on payment and settlement systems are discussed in the *Report on consolidation in the financial sector*, Group of Ten, January 2001.

an outcome in which central bank money crowds out private initiative, nor an outcome in which central bank money is phased out by a market mechanism. Neither of these two outcomes is regarded as plausible in the near future. The everyday policy decisions of central banks, illustrated in this report, are less dramatic and more pragmatic in nature.

Central banks have generally adopted similar objectives in developing their payment system policies. As set out in the Core Principles and the SSS recommendations, these objectives fundamentally include the pursuit of safety and efficiency. The CPSS central banks have endorsed the Core Principles and the SSS recommendations as the basic norms for oversight of systemically important payment systems and of securities settlement systems and pursue similar operational strategies, such as providing RTGS services to banking organisations.

The common ground shared by CPSS central banks in their objectives as well as in their main tenets of policy concerning the use of central bank money can be summarised in 10 propositions that are set out in the conclusion to this report (see Section 5).

There are also variations in payment system policies among CPSS central banks. Perhaps one variation to note here is the degree to which central banks provide settlement services in parallel to commercial firms (mainly banks) and the extent to which they establish norms delimiting the respective roles of the central bank and commercial banks. Every central bank develops its own combination of operational involvement and normative involvement, although it is true that different traditions make them lean more towards one or the other. The variations may in some cases also involve different trade-offs between safety and efficiency, as well as different opportunities for improving both safety and efficiency in particular markets. They may also reflect potentially different risk tolerances in addressing non-systemic risks. In some cases, legislation or national policies also incorporate differing social policies or constraints involving consumer protection, banking structure, competition policy or national security.

Structure of the report

The issues raised in this summary and introduction are explored in more detail in the rest of the report. Section 1 considers the factors that affect the mix of central and commercial bank money in payment systems. Section 2 then looks at some of the current developments affecting payment systems and the impact they may have on the use of central bank money. In the light of this analysis, Sections 3 and 4 turn to central bank policies. Section 3 describes existing central bank policies, while Section 4 looks at the possible implications for these policies of the developments set out in Section 2. Section 5 provides some concluding remarks, including the 10 propositions mentioned earlier. Finally, the annexes contain more detailed information on some of the topics discussed in the report.[11]

1. The coexistence of central and commercial bank money in payment systems

Money is fundamental to the operation of a modern economy. A common feature of developed economies is the wide variety of ways in which payments are made and the forms of money used. There is also a wide range of economic agents whose liabilities function as money. The most familiar issuers of money are central banks, which provide central bank money in the form of both banknotes and deposit liabilities, and commercial banks, which generally issue private money (commercial bank money) in the form of deposit liabilities.

Economic activity can in principle take place without the coexistence of central and commercial bank money. Indeed, both corner solutions - on the one hand, narrow or monobanking where there was only central bank money and, on the other hand, free banking where there was only commercial bank

[11] For definitions of standard payment system terms used in this report, see *A glossary of terms used in payment and settlement systems*, BIS, January 2001. (All the BIS publications referred to in this report, including the latest version of the glossary, are on the BIS website, www.bis.org.) Terms that are specific to this report are defined as they are used.

money - have existed in the past. But neither has proved sufficiently stable or efficient to survive. There has been a migration away from the corner towards intermediate solutions in which both types of money play an important part in facilitating economic activity. CPSS central banks continue to believe that the most effective and efficient financial system is one in which there is competition among banks and in which central bank money is used where its particular features are most important.

An important feature of this coexistence is that, in a given currency, central and commercial bank monies are convertible into each other at par. Conversion at par removes the very high transaction costs that could arise for users of a currency if there were multiple issuers whose monies were exchanged at different values. Conversion between commercial and central bank monies takes place in a tangible manner when a commercial bank depositor withdraws banknotes from an account. Conversion between different commercial bank monies takes place through payment systems when a customer of one bank makes a payment to a customer of another bank, using central bank money as the bridge in most cases.

This section looks in more detail at this coexistence of central and commercial bank money. It looks first, in Section 1.1, at central bank money and the central bank's objectives. Section 1.2 then considers how payment systems function and the role of the settlement institution, while Section 1.3 discusses the factors determining the choice of settlement asset.

1.1 Central bank money and central bank objectives

Central banks provide central bank money to support their core objectives. CPSS central banks vary in how they articulate these objectives, but they can be broadly categorised as pursuit of monetary policy goals, maintenance of the stability of the financial system and promotion of the effectiveness or efficiency of the financial system. Within the context of these broader objectives, CPSS central banks recognise that the ability to make payments safely and efficiently is crucial to the functioning of the financial system, both domestic and global. Sound and efficient payment mechanisms enhance the allocation of resources, facilitate growth and improve social welfare. This report focuses on the role of central bank money as a means of payment.

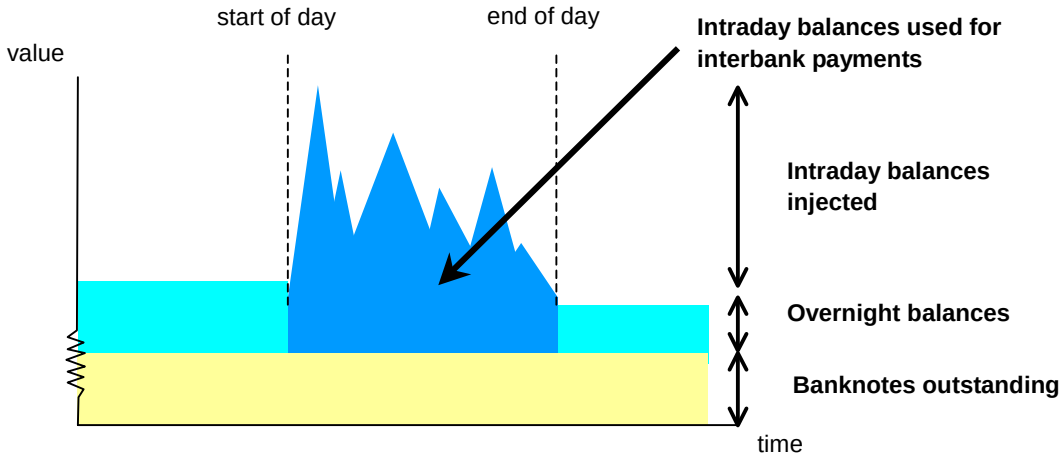
As noted above, central bank money takes two main forms - banknotes and deposit money. Banknotes are probably the most visible symbol of a currency and play a widespread role in the making of retail payments. Moreover, the value of banknotes outstanding is generally significantly larger than the stock of central bank deposit money in existence. However, while banknotes are undeniably important in an economy and raise a number of issues for central banks - most notably concerning the costs of distribution and the prevention of counterfeiting - they generally do not raise the sort of systemic risk issues of core concern to central banks because of the relatively small values typically involved when payments are made. Banknotes are therefore not directly covered in the rest of this report, although Annex 4 provides some more information about their features and usage.

On the other hand, central bank deposit money plays a crucial role as the settlement asset in payment systems which transfer substantial values of funds each day and where there is significant potential for systemic risk. The quantity of central bank money and/or the terms on which it is available are of course pivotal aspects of central banks' monetary policy. But, as illustrated in Figure 1, balances with the central bank also play an important role from the viewpoint of payments policy. During the day, deposits with the central bank can be used to make interbank payments, whose completion is a critical activity for the economy at large. If the intraday balance available for payments is too small relative to the value of payments to be made in a given time, it could result in gridlock, preventing payments from being executed. Thus in many cases central banks provide intraday credit to banks and other account holders. Indeed, particularly with the decline in importance of reserve requirements in many economies, balances held by banks during the day are often substantially larger than those held overnight.[12]

[12] Figure 1 is a stylised diagram that is not intended to indicate actual magnitudes of central bank money. Other transactions (such as sales/purchases of cash or provision/repayment of overnight credit) are included within "intraday balances injected". For data on overnight balances and intraday credit on central bank accounts, see Table B in Annex 3.

Figure 1

Stylised diagram of central bank money



The smooth and safe functioning of a payment system is dependent not just on the *quantity* of the settlement asset. It also depends crucially on the *quality* of the asset and thus on the identity of the settlement institution. To explain this, Section 1.2 considers how payment systems function and thus the role of the settlement institution in them.

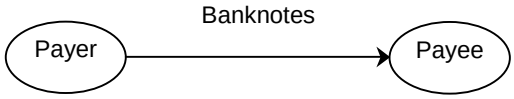
1.2 How payment systems function and the role of the settlement institution

1.2.1 Simple models of how payment systems function

Different forms of money require more or less complex arrangements to enable them to be used to make payments. The two most common forms of money used to make payments are banknotes and commercial bank deposit money. Banknotes are bearer instruments and thus the payments process is simple - the notes are simply transferred from payer to payee, as illustrated in Figure 2.

Figure 2

Payment by banknotes



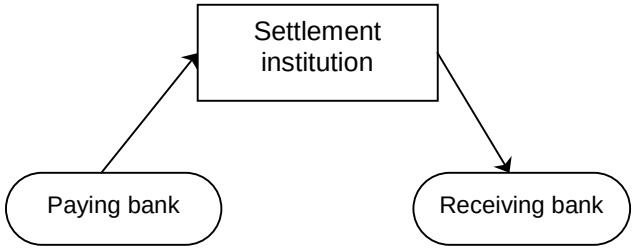
However, where commercial bank deposit money is used, transfers generally take place within organised "payment systems" where commercial and central bank money often complement each other in more complex chains of payments. Although the term "payment system" can be used broadly to refer to the entire web of payments within an economic area, it is often applied in a more limited sense to refer to an interbank payment system, incorporating a particular set of payment instruments, technical standards for the transmission of payment messages and an agreed means of settling claims among system members, including use of a nominated settlement institution.

The simplest case of making a payment in an interbank payment system is shown in Figure 3. This stylised payment system has one intermediary, generally (although not always) the central bank, which acts as the settlement institution. The paying and receiving banks are both direct participants in the interbank payment system and hold accounts at the settlement institution, and settlement is effected by a debit from the account of the paying bank and a credit to the account of the receiving bank. The payment may either be financed with funds already on the account of the paying bank, or

with credit provided by the settlement institution. The receiving bank may leave the funds it receives on account at the settlement institution or it may decide to pay them away.

Figure 3

Simple interbank payment system

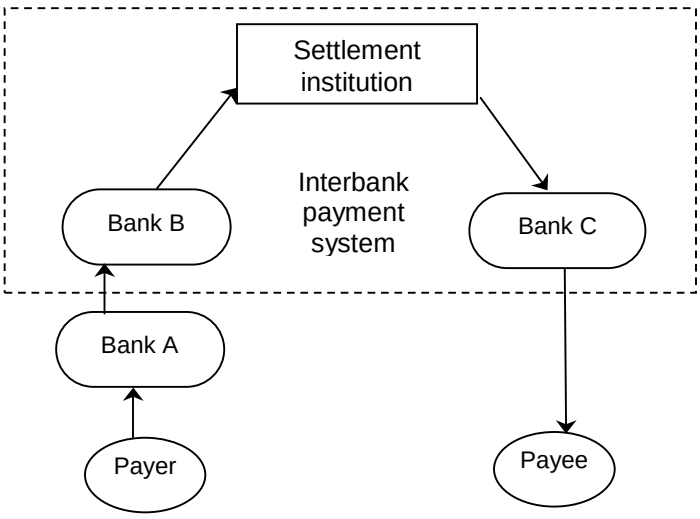


While this is a simple example, it illustrates the crucial role played by the settlement institution, and the ways in which paying and receiving banks are exposed to it. Settlement takes place in the settlement institution's liabilities, and both paying and receiving banks need accounts with that institution. Both are reliant on the settlement institution's operational soundness. And they will be exposed to credit risk on the settlement institution in relation to any funds held on account. These risks may be difficult to avoid or to control. For example, receiving banks may have very little control over the value of payments received and held on account with the settlement institution. The larger the value and volume of payments the institution settles, the more important are its creditworthiness and operational reliability.

In practice, payment arrangements, both domestic and particularly cross-border, are invariably far more complex than this, involving tiers within and between which payments are made. As before, those holding accounts with the settlement institution - the direct participants in the "system" - are generally banks ("settlement" or "correspondent" banks), which in turn provide accounts and payment services to their own customers, which may be other banks, non-bank financial institutions, non-financial firms or individuals. In this world, the "payment system" is a broader construct, involving various tiers of intermediation, as shown in Figure 4. For clarity, in the remainder of the report the narrow set of arrangements involving the settlement institution and those holding accounts with it will be referred to as the "interbank payment system". The term "payment system" will be used to describe the broader, tiered arrangements described below.

Figure 4

More complex payment arrangements



In this more realistic example, the payment chains are more complicated. Take a payment between a customer of Bank A (a second-tier bank - ie one that is not a direct participant in the interbank

payment system) and a customer of Bank C (a direct participant in the system). The payment process involves debiting the payer's account at Bank A, Bank A's account with Bank B and Bank B's account with the settlement institution. It also involves crediting Bank C's account with the settlement institution and the payee's account with Bank C.

In practice, a number of "payments" are taking place, using different types of "money". The settlement institution will generally (although not always) be a central bank, so settlement between direct participants in the interbank payment system takes place in central bank money. But the accounts of most payers and payees will be held with intermediary banks, and payments (debits) and receipts (credits) will take place in commercial bank money issued by different commercial banks. Indeed, while data are scarce, if the different components of payment chains are aggregated it is quite possible that in many cases the value of payments settling in commercial bank money exceeds that settled in central bank money (see Section 2).

The "payment chain" is actually a combination of various payments at different tiers, whose "settlement" takes place independently. In some jurisdictions, unless otherwise contracted between payer and payee, the point at which the underlying payment obligation has been extinguished will coincide with the payment being "settled" within the interbank payment system. In other jurisdictions, this is not generally the case. In any event, finality does not imply that the payee has yet received the funds, so the payee may remain exposed to intermediaries even though the payer has legally discharged its obligation. The moment in which final settlement takes place is defined primarily by the rules of the interbank payment system. Furthermore, local laws may affect the timing or conditions under which final settlement takes place.

This model is used for both domestic and cross-border payments. The latter, ie where the payer and/or the payee is non-resident, generally involve some form of domestic payment. The payer/payee's bank may be able, and choose, to access the domestic interbank system directly on a remote basis. If not, it will use the services of a correspondent bank, which may in turn access the relevant system directly or use the services of a local bank. Final settlement may take place at a number of levels (across the books of the settlement institution and/or those of a first- or lower-tier commercial bank), depending on each counterparty's payment arrangements.

The model is also applicable to the payment arrangements associated with securities settlement systems (see Box 1). Such arrangements are included within the definition of "payment system" and are therefore covered in the analysis in the rest of this report.

1.2.2 Risks relating to the settlement asset[13]

Essentially the same risks can arise within the sort of interbank payment system described above as within the "simple" payments model outlined earlier.

Risks relating to the settlement institution

As stated earlier, direct participants have potential exposures to the settlement institution, as does the settlement institution to the direct participants. Credit exposures may exist where funds are held with the settlement institution or advanced by it to direct participants. There may be liquidity risks if the settlement institution fails to meet any commitments it has made to provide liquidity to direct participants. And direct participants are reliant on the operational capability of the settlement institution. The nature, size and duration of these exposures depend very much on factors such as the design of the system, the availability of credit and the arrangements for funding/defunding the accounts held at the settlement institution.

The use of central bank money as the settlement asset in systemically important payment systems (SIPS)[14] eliminates credit and liquidity risk at the apex of the payment system, where exposures are

[13] The term settlement asset is often used exclusively to refer to the asset used for settlement between direct participants in an interbank payment system. However, for convenience, in the rest of this report the term is also used to indicate the asset used for settlement between a direct participant and its customers.

[14] For an explanation of systemically important payment systems, see *Core principles for systemically important payment systems*.

generally highest and most concentrated, and where direct participants have least choice over the source of their exposure. And the central bank's role as settlement institution provides assurance of continuity in the provision of liquidity and in the provision of settlement services.

Box 1

Securities settlement systems

Securities settlement systems (SSSs) are systems which mainly provide custody services and final delivery of securities from the seller to the buyer. When securities are traded in exchange for funds (as is usually the case), SSSs also ensure the transfer of the related funds in the relevant payment system. This payment system may be embedded in the SSS or external to it.[15]

If the payment system is embedded, both securities and cash are transferred within the same organisation. Examples of SSSs with embedded payment systems are central bank CSDs (for the settlement of government securities), which naturally use central bank money, or, on the other side of the spectrum, private CSDs (or ICSDs) using commercial bank money.

An example of an SSS with an external payment system is a CSD which is privately owned but which settles in central bank money. When the payment system is external to the SSS, a number of issues arise. For example:

- the participant of the CSD also needs to have access (directly or indirectly) to the payment system;
- the CSD and the payment system need to have compatible operating hours;
- where collateral is needed to obtain credit in the payment system, there may be advantages to CSD participants if the assets held at the CSD can be used as collateral.

Risks between direct participants and their customers

Similar exposures arise between direct participants and their customers. Customers are operationally reliant on their chosen intermediary to make payments on their behalf, and incur credit risk where receipts of funds are held with the intermediary. In turn, intermediaries incur risks on their customers where they provide them with credit for payments. Such risks are not unusual - they arise, and are managed, in the normal course of banks' and their customers' activities. But exposures arising within the payment system may be very large, especially when the customer is a bank, since the values transferred can be very significant. They may also be difficult to control and, depending on the degree of tiering within the system, the number of direct participants may in practice be low, limiting the choice of intermediary.

The distribution of payments affects the distribution of risk within the system. Where large values of payments flow through a small number of direct participants, the consequent exposures may be very large in relation to each direct participant's capital. Each direct participant stands between its own customers and other direct participants, such that other direct participants are to some degree sheltered from the risk of default by non-participants and vice versa. However, as a consequence, direct participants acting for a large number of customers may incur very high exposures, both to their customers and to other direct participants, and may be more vulnerable to shocks within the payment system or their customer base. At the same time, the impact of the correspondent's failure on others may be greater. In systems in which flows are highly concentrated, each direct participant's ability to

[15] Other models which are neither completely embedded nor completely external also exist. An example is the settlement model developed by the French CSD and the Bank of France. The Bank of France has granted the securities settlement system a mandate to operate dedicated accounts in central bank money. The cash leg of securities trades is settled on these dedicated accounts. This architecture enables Euroclear France to check the availability of the securities on the seller's securities account as well as the availability of cash on the buyer's dedicated account, and to transfer simultaneously securities and funds between the participants in a way that ensures delivery versus payment and real-time finality in central bank money. The Bank of France has also mandated Euroclear France to operate intraday credit operations on its behalf for those participants whose dedicated account balance is not sufficient to settle a trade. Since this intraday credit is automatically allocated to the dedicated cash accounts operated by Euroclear France, no permanent link is necessary with the RTGS system. Consequently, these automated intraday repos can take place even outside the RTGS operating hours.

manage the associated risks is one determinant of how easily financial shocks to one part of the system are transmitted throughout the system and to other parts of the financial sector.[16]

1.3 Factors determining agents' choice of settlement asset

The example in Figure 4 illustrates how different forms of settlement asset (generally central and commercial bank money) coexist. The balance between the different forms will depend on various factors, including the design of the interbank payment system and the policies of the relevant central bank. These are discussed in Section 3. But a key determinant of the balance will be the choices made by potential payment system users.

In general, payment system users have a choice between being a direct participant in the system or using a correspondent, and in the latter case a choice between correspondents. Their choice will be influenced by the private costs and benefits associated with each option. Some of these costs and benefits will relate to features of the institution providing the settlement asset, such as its creditworthiness and neutrality. Others will relate to the services, such as credit, which that institution is prepared to provide and to the design of the payment system within which the asset will be used.[17] Differences between settlement assets are usually a matter of degree - safety and many of the other relevant features are relative concepts, not qualities which assets either do or do not possess.

Safety

The "safety" of different forms of money, in the context of their use as settlement assets, essentially means the likelihood of the asset retaining its value to the holder, and hence its acceptability to others as a means of payment.

Central bank money is generally completely safe in its jurisdiction. Central banks are more creditworthy institutions than commercial banks in their own currency. They have explicit or implicit state support. In a fiat money system, where not constrained by a convertibility rule to another asset/currency, the central bank can always cover its obligations by issuing its own currency. In addition, central banks tend to be risk-averse institutions which seek, as far as possible, to engage only in low-risk financial activities. Indeed, the term "ultimate settlement" has sometimes been used to indicate settlement in central bank money, although the term needs to be used with care (see Box 2).

The creditworthiness of commercial banks is tested through their ability to convert on demand their sight liabilities into the money of another commercial bank or into central bank money. In practice in CPSS countries, the generally high credit standing of commercial banks means that default risk is unlikely to be a significant disincentive to maintaining settlement accounts with commercial banks. Prudential supervision reduces the likelihood of default by supervised institutions, improving the safety of claims on these institutions. And the existence of investor/depositor protection schemes has the effect of maintaining at least partial convertibility of a failed bank's liabilities into other forms of money, and hence supporting their value as settlement assets. Utilities like clearing houses often go further in lowering default risk by fully collateralising any exposure to their members and not engaging in any further financial activities which could expose them to risk. Thus other factors, including the asset's availability and liquidity, are likely to be a more significant determinant of choice of settlement asset.

It should be noted, however, that the safety of both central and commercial bank money is influenced by the ability of the central bank to maintain the value of the stock of currency as a whole - ie price stability.

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[16] The analysis in Section 1.2.2 is based on the assumption that banks that are not direct participants in a system use a *commercial* bank to act as their correspondent (eg in Figure 4, Bank A uses Bank B). However, in a few cases central banks themselves provide correspondent services to customer banks that are not direct participants in systems that settle in central bank money. In these circumstances, the risks that arise are likely to be similar to those that arise where banks *are* direct participants.

[17] Those choosing direct participation are of course constrained to use the settlement asset that has been collectively chosen by the system. Thus the choice of settlement asset cannot be made independently of the wider choice between direct participation and non-participation, which will depend on a wider range of factors than those relevant to the settlement asset itself.

Box 2

"Ultimate settlement"

The term "ultimate settlement" is sometimes used to denote final settlement in central bank money (see *A glossary of terms used in payment and settlement systems*). As such, the term combines two distinct concepts - finality and the nature of the settlement asset used to achieve finality in payment systems.

Finality is achieved when settlement of an obligation is irrevocable and unconditional. As discussed in the Core Principles, finality within an interbank payment system is generally determined by the system's rules and the legal framework within which the rules function. The definition should apply even in abnormal circumstances. For example, some systems have rules or procedures that allow payments to be unwound if a participant fails to meet its settlement obligation. Settlement cannot be considered final until there is no further possibility that it will be unwound, because all conditions have been satisfied. In practice there can be many obstacles to achieving finality. Some can be overcome by a proper contract between the parties. Others may require changes to the law. A significant obstacle can be insolvency law, which typically takes precedent over contract law and can thus overturn what would otherwise be a settled transaction (eg zero hour rule). Because of the complexity of legal regimes and system rules, a number of jurisdictions have special laws designed to secure payment system finality (eg the European Union's Settlement Finality Directive).

Subject to any specific requirements of the law, parties are usually free to choose which asset to use as the settlement asset. Many interbank payment systems use central bank money, but this is not always the case (see Annex 3, Table C). Regardless of the settlement asset used, it is necessary to establish when finality occurs. In general, the law does not distinguish between assets in this respect: settlement finality is no easier or harder to achieve in central bank money than in any other asset. On the other hand, as discussed in the main text, the choice of settlement asset *is* important for other reasons, not least because, even when the original payment obligation is fully extinguished, for the payee there can be both credit and liquidity risks associated with holding the resulting settlement asset.

The term "ultimate settlement" thus combines the concept of settlement being final with the concept of the settlement asset being the least risky possible. As noted in the Core Principles, claims on the central bank are typically free of the credit and liquidity risks associated with settlement assets. Where this is the case, it may be appropriate to use the term "ultimate settlement" to denote final settlement in central bank money.

Liquidity and credit

"Liquidity" is a valuable characteristic for a settlement asset to possess. Certain forms of settlement asset are usually said to be more liquid than others, with central bank money generally held to be the most liquid. However, used in the context of the demand for different forms of money for settlement purposes, liquidity can have more than one meaning.

As a rule, an asset's "liquidity" is defined as the holder's ability to dispose of it quickly without material loss of value. Within the payment system of an economy, that translates as its ability to be used as a means of making payments to a wide range of counterparties. In part, that will reflect the creditworthiness of the issuer and thus is closely related to safety. However, the efficiency with which money can be transferred between customers of different banks is also highly relevant. This will reflect the scope of the payment network of end users and the speed and cost of transferring funds within and between banks and interbank payment systems.

"Liquidity" is also often used to describe the issuer's ability to expand its balance sheet by issuing additional liabilities to its customers at short notice. In this context, commercial banks are constrained by the desire to avoid a destabilising "run", perhaps supported by prudential or statutory requirements. Central banks do not face this constraint,[18] and their ability to inject very large amounts of liquidity, where appropriate, in order to facilitate the smooth operation of large-value payment systems even when the financial system is under stress is one argument for their acting as settlement institution.

Particularly in large-value payment systems, account holders are likely to want access to some form of routine credit facility. The absence (or insufficiency) of credit can impose costs on payers, by requiring

[18] Central banks do not face this constraint vis-a-vis other assets in the same currency but there can of course be runs on a currency as a whole, a possibility which may inhibit central banks' ability to provide very large amounts of liquidity.

closer control over payment flows, and/or by resulting in failed payments which can generate penalties and damage business relationships. The terms on which credit is provided can thus influence the choice of the settlement asset. Providers of credit usually make a charge, explicitly in the form of facility and drawdown charges and/or implicitly by requiring collateral. CPSS central banks (with the exception of the Federal Reserve) provide intraday credit free of charge but require collateral.[19] Commercial banks are generally free to lend unsecured and may be more willing to do so, but would in many cases apply higher direct charges to reflect the higher risk.

Central banks generally require intraday credit to be repaid by close of business and may impose high charges where accounts are overdrawn. Commercial banks may be more willing to extend overnight credit. Moreover, commercial banks typically remunerate positive balances held at close of business; central banks may not, at least not at market rates.

The amount of liquidity - and thus potentially the amount of credit - needed to fund payment flows will be another factor in the choice of settlement asset. Direct participation in interbank payment systems typically requires significant amounts of liquidity. And while design features have been introduced into some systems in order to economise on liquidity, correspondent banks may be able to manage their customers' payment flows so as to reduce the amount of liquidity and credit each customer needs to obtain.

Neutrality

Another relevant factor is the extent to which use of an asset makes the holder reliant on the services of a competitor, or requires the holder to provide a competitor with sensitive business information. In this context, central banks, as primarily non-profit-maximising organisations, are generally perceived to be broadly neutral by market participants, which may favour their liabilities being held for settlement purposes.

Related payment services

The costs and benefits of holding different forms of settlement asset cannot be understood simply by reference to the intrinsic qualities of each asset or its issuer. In this context, the asset is held specifically in order to make payments, and users will need a range of related services.

The services available, and their cost, are important components of demand for different forms of settlement asset. Provision of settlement accounts may come bundled up with other payment services, for example the provision of information on balances or on the progress of particular payments. Central banks often provide quite sophisticated information flows on account balances, in part to ensure the smooth operation of the interbank payment system, but few other value added services. Related services more likely to be provided by commercial banks include the ability to use a single account in a number of contexts, for example to settle transactions in different markets, and perhaps in different currencies. Commercial banks may be better able to provide expertise in the operation of a range of payment and settlement systems. Operating hours, and related factors such as the hours in which the account can be accessed, payment instructions input and settlement achieved, will also influence users' choice.

Regulatory costs and perceived benefits

Finally, the provision of central bank money may be associated with other costs and perceived benefits that have little to do with the service provided or the quality of the settlement asset. For example, most central banks will only provide account facilities, and credit, to financial institutions that are subject to regulation, and regulation may imply significant private costs.

Equally, there may be some perceived financial benefit in utilising central bank money, and in maintaining an account at the central bank, because of the perception that access to an account provides semi-automatic access to emergency liquidity from the central bank - ie moves the institution

[19] The Federal Reserve charges a fee for intraday credit and sets net debit caps. Certain institutions can obtain credit beyond their cap by pledging collateral.

within the central bank "safety net". Central banks do whatever they can to correct this misperception, but there is anecdotal evidence that it continues to persist in some markets.

1.4 Conclusion

Section 1.2 explained how the typical payment system operates, and how both central and commercial bank monies are used within it. Section 1.3 illustrated how the two forms of money are, to some extent, substitutes. Factors such as safety, liquidity and neutrality may point towards the use of central bank money. Others - such as availability and cost of services - may not. Central banks therefore need to be mindful of the factors that potential holders of their liabilities take into account in making private decisions.

Of course, in the real world, not all users have access to both forms of money. Central banks apply policies which limit access to their liabilities, and associated services such as credit, to a subset of institutions. Moreover, other constraints may exist, for example membership criteria applied by interbank payment systems, which further limit choice. Conversely, central banks may require private agents to use central bank money in some contexts.

Before reviewing central banks' policies in this area, the report explores a range of ways in which recent and continuing developments are affecting the structure and use of payment systems, and the use of central and commercial bank money within them.

2. Influences on payment systems and their impact

The payment system "model" described in Section 1 is not uniform across CPSS countries. Nor is it static. Today's payment systems are the product of many years of change in the design of payment and settlement systems and in the markets in which they operate. Many important changes originated in the mid-1980s, with the liberalisation of capital flows between developed economies and the accompanying liberalisation of, and opening-up of competition within, financial markets. Other changes originated from a growing recognition among CPSS central banks, in the late 1980s and early 1990s, of the importance of a robust market infrastructure, and in particular sound payment and settlement systems, for financial market stability and efficiency.

In consequence, payment and settlement systems have gone through a process of significant change over the past decade, with the introduction, where they did not already exist, of risk-reducing features such as real-time gross settlement (RTGS) into interbank payment systems, and delivery versus payment (DVP) into securities settlement systems; the use of new technology to offer improved functionality and communications at reduced cost; and the integration and automation of different elements of post-trade processes.

That process of change is still under way. This section looks at a range of recent developments that have affected, and continue to affect, the use of payment systems within CPSS countries, and which are relevant to policy on the use of central bank money.

The analysis in this section is to a large extent based on anecdotal evidence. A considerable body of data exists on the amount of central bank money in circulation and on its use as a means of payment. However, data on other relevant factors, for example on values of payments made in commercial bank money, or on the degree of concentration of payment activities within correspondent banks, are scarce. Nevertheless, it seems likely that the developments identified are taking place, to a greater or lesser degree, in all CPSS countries, and that they need to be monitored. If this is to happen, better information may be required on payment activities outside the interbank payment systems.

2.1 Influences on payment systems

There are a number of wider economic forces, affecting the financial system as a whole, that have implications for payment systems and in particular for the balance of use of central and commercial bank money. Specifically, over the last couple of decades financial markets have been affected by the powerful forces of liberalisation, technological innovation, globalisation and consolidation. Payment

arrangements have been affected by these interrelated forces, which continue to be important and may become more so in future, through a number of channels.

Liberalisation

Liberalisation of the activities that different types of institutions can carry out inevitably blurs the distinctions between these institutions. It has long been the case that different countries have placed differently the distinction between banks and non-banks but the situation becomes more complex in a world of global service providers. For example, in the wholesale area, large non-bank financial institutions such as securities firms (and in some cases insurance companies) are increasingly involved in making payments in order to settle securities or foreign exchange deals on their own and their clients' behalf. The size of payment activities of such institutions may be equivalent to that of many banks. And in some markets specialist institutions have emerged to provide payment-related services that would previously have been provided by banks (eg non-bank operators of automated teller machines (ATMs)).

Technological advances

Interbank payment systems have also been affected by technological advances in a number of ways. Improved technology has facilitated and reduced the cost of access to payment systems by a wider range of institutions, for example by allowing institutions to take advantage of cheap, off-the-shelf access and processing packages and by encouraging the use of standardised, widely used communications protocols. It has also made it possible for interbank payment systems and their participants to process large volumes of payments not only quickly and at low cost but also in a concerted manner with other payment-related activities such as providing credit, providing collateral and settling securities and foreign exchange transactions. On the other hand, it also means that correspondent banks may need to make greater investments in order to meet their customers' demands for sophisticated payment services.

In the retail area, technology and innovation have led to changes in payment services such as the growing use of card payments and the introduction of e-money and internet payments that involve some non-bank payment service providers. Such developments are likely to become increasingly important in the future.

Globalisation

Another important force is globalisation. Among other things, the liberalisation of capital movements has resulted in significant growth in cross-border flows in recent years. As a result, financial institutions active in the securities, foreign exchange, derivatives and other financial markets have, over a period of time, become more active in making and receiving payments in multiple currencies. Such payments are processed largely through correspondent banking arrangements that have, as a result, acquired growing importance.

The widespread use of correspondents reflects a number of factors. Non-resident institutions may find it difficult to directly access remote interbank payment systems for a number of reasons. Even where that is not so, accessing multiple foreign payment systems may be costly and complex, requiring investment in technology and in acquiring the necessary understanding of local markets. Commercial correspondents are able to achieve economies of scale and scope, and to offer a range of services that are attractive to firms operating in multiple markets and that central banks are currently unable or unwilling to provide. In particular, commercial banks offer multicurrency payment services and associated expertise in the operation of multiple payment systems, which can greatly reduce settlement costs for global financial and non-financial institutions.

Recent years have also, however, seen the emergence of other more formalised services to cater for such needs. The prime example is CLS Bank for the settlement of foreign exchange deals on a payment versus payment (PVP) basis. CLS is widely predicted to lead to greater concentration of correspondent activity into those banks that are direct participants in, or act as nostro agents for, CLS. On a smaller scale, the introduction of US dollar and euro RTGS systems in Hong Kong SAR similarly reflects a desire among participants in the Hong Kong markets to achieve cost savings in their US dollar- and euro-based activities through collective use of, in effect, a highly concentrated correspondent banking arrangement.

Consolidation

Finally, consolidation - both within the financial market infrastructure and more particularly among the major financial market intermediaries that are the main direct and indirect users of payment systems - is also a powerful force for change. Consolidation can itself be spurred by the other forces of liberalisation, globalisation and technology that between them may encourage the development of larger institutions with a greater range and scope of activities.

From the point of view of this report, there are perhaps two aspects of consolidation which are of particular relevance. Perhaps the most important aspect is that consolidation can result in a concentration of payment flows and hence risks in a relatively small number of institutions. But where consolidation is caused by liberalisation that enables mergers between banks and other types of financial institutions - as, for example, in the United States as a result of the GLB legislation[20] - a second aspect could be a further blurring of the distinctions between those with access to central bank accounts and those without access, in this case because some entities have access through affiliates while others do not.

Consolidation is not new. Nor is the concentration of financial market activities within a smaller number of firms that typically results from consolidation. Changes in the pace of consolidation are, in most countries, more a matter of degree - at least as far as they relate to the payment system. The Ferguson Report[21] nevertheless found evidence of consolidation in recent years among the world's major financial firms, including those providing correspondent banking and custody services.

2.2 Impact on payment systems

One very important consequence of some of the developments discussed in Section 2.1 is that the payment system infrastructure is significantly safer overall than was the case, say, 15 years ago. Awareness of the potential for systemic risk in payment and settlement arrangements grew as liberalisation and globalisation caused the values handled by these systems to increase. This has led to major changes in the design of payment and settlement systems (such as RTGS, DVP and PVP), in many cases facilitated by improvements in technology. While there has as a result typically been no change per se in the settlement asset used within interbank payment systems (which was, and generally continues to be, central bank money), increased safety has been achieved by changing the type and form of intraday credit used. Poorly visible and weakly managed intraday exposures between system participants have been replaced by explicit, controlled intraday credit provided by the central bank. In many systems, therefore, there is more active and extensive use of central bank money than used to be the case.

However, the developments also have other effects, the implications of which are less clear. The rest of this section therefore considers the possible impact of the developments on payment systems in a world unconstrained by central bank policy. First, it looks at how the developments could affect institutions' choices between direct participation and non-participation in interbank payment systems. Then it considers the possible impact on the pattern of payment activity and, in particular, the extent to which the developments may lead to greater concentrations of payment flows. Existing policies on the use of central bank money, and how central banks may respond to the impact of these developments, are then considered in Sections 3 and 4 respectively.

2.2.1 The choice between direct participation and non-participation

The changes described above can shift the balance of costs and benefits between, on the one hand, direct participation in interbank payment systems and, on the other hand, non-participation (ie accessing the system as a second-tier bank, using a direct participant as a correspondent). Such shifts are of course of direct relevance to those, such as banks, which are allowed to have an account

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[20] The 1999 Financial Services Modernization Act (also known as the Gramm-Leach-Bliley Act) authorised the creation of financial holding company structures that could contain banking, securities and insurance affiliates, thereby removing some of the restrictions contained in the 1933 Glass-Steagall Act.

[21] See *Report on consolidation in the financial sector*.

at the central bank and thus already have the choice between direct participation and non-participation. But equally they are of relevance to other institutions currently not allowed access to central bank money but which - insofar as the developments tilt the balance for them in favour of direct rather than non-participation - may request central banks to change their policies.

In fact, the balance could shift either way. Each of the changes discussed below may have multiple effects, some of which may encourage direct participation and some of which may discourage it. Moreover, the strength of the various effects may differ from institution to institution and thus it is impossible to generalise whether the net effect will be an increase or decrease in direct participation overall.

Some design improvements have increased the cost to direct participants of managing the liquidity they need to finance their payment flows. Moreover, with RTGS systems the cost of liquidity has become explicit rather than implicit. In non-RTGS payment systems, intraday liquidity is implicit and free of charge. The costs are the uncertainties associated with maintaining an open exposure. In RTGS systems, however, intraday liquidity is explicitly provided in the form of central bank credit. Such intraday credit involves a cost - either the opportunity cost of holding the collateral required by the central bank or an explicit charge. Similarly, the introduction of Model 1 DVP[22] with settlement in central bank money entails an increase in the collateral needs of SSS direct participants or the settlement banks acting on their behalf. Moreover, the introduction of CLS has potentially significant implications for settlement members' liquidity management. While considerable effort has gone into designing CLS so as to minimise the amount of liquidity required to settle transactions through the system, the requirement to fund (net) positions at specific times during the day introduces a new element for treasury managers.

On the other hand, technological advance tends to reduce the cost of operating and communicating with interbank payment systems, and so the cost of direct participation. For the reasons set out above, access to cheap, off-the-shelf technology can make it easier for a wider range of institutions to access interbank payment systems directly. Of course, such technology also enables direct participants to offer their customers improved services at lower cost, so the impact on the relative cost of direct participation and non-participation is difficult to determine.

Increases in the volume of business may also have an ambiguous effect on the balance of advantage between direct participation and non-participation. For example, some of the developments (such as the growth in cross-border business) have probably resulted in more payments being channelled through correspondent banks. Other things being equal, this should allow those banks to achieve cost reductions through economies of scale and scope, some of which would probably be passed on to their customers - encouraging them to remain non-participants. But equally, those customers themselves may be handling greater volumes that may tilt the balance in favour of direct participation.

Other factors may also be relevant. In some countries, a blurring of the distinction between banks and non-banks may mean that there is a greater range of entities involved in the provision of payment services, which are thus potential candidates for direct participation. The neutrality of the settlement institution may also be a more important factor for non-banks when they are competing directly with banks in other lines of business such as insurance.

The overall impact of all the changes on the balance of costs and benefits of direct and non-participation in interbank payment systems is extremely difficult to quantify. Indeed, individual institutions are likely to be affected in different ways. Recent years have seen requests for access to payment systems from a wider range of institutions, which may in part reflect changes in the relative cost of direct participation. However, at the same time the number of participants in most interbank payment systems overall has remained broadly static or contracted, and central banks have been requested to address some of the perceived costs - particularly those related to liquidity - of direct participation.

[22] Model 1 DVP means gross, simultaneous settlement of securities and funds transfers. See *Delivery versus payment in securities settlement systems*, BIS, September 1992.

2.2.2 Concentrations of payment flows

The developments discussed in Section 2.1 above also have the capacity to affect, and in some cases have affected, the concentration of payment flows in the payment system.

- Other things being equal, consolidation could result in increased concentration of payment flows among a smaller number of large payment intermediaries. Consolidation between direct participants in the interbank payment system leaves a smaller number of direct participants responsible for settling broadly the same value of customer payments. Consolidation involving non-participants may also result in individual direct participants accounting for a larger proportion of total payments.[23]
- Increases in cross-border flows from non-resident institutions may also result in larger values of payments being made and received by direct participants on behalf of non-resident customers. Since it is typically the case that some direct participants specialise in such correspondent banking, this is likely to increase concentration.
- To the extent that the cost factors discussed in Section 2.2.1 might tend to discourage direct membership of the interbank payment system, increased tiering could result in a larger proportion of total payments being accounted for by non-participants (and passing through and between a smaller number of direct participants).

The result can be greater concentration of payment activities through individual direct participants in interbank payment systems.

Moreover, any of these developments can offer greater scope for direct participants to internalise customer payments (as "on-us" payments)[24] rather than settle them through the interbank payment system. As a result, a greater proportion of payments may be made between holders of commercial bank money, perhaps without central bank money being involved at any stage in the chain of payments. At the extreme, the concentration of payment activities could result in the emergence of correspondent banks that deal with such large values of "on-us" payments, and whose activities are sufficiently integral to the smooth functioning of the economy, that they have some of the characteristics of interbank payment systems - so-called "quasi-systems", discussed in more detail in Section 4.

Most interbank payment systems already exhibit a degree of tiering and many have significant concentration. Section 1 described a "typical" payment system, with direct participants - correspondent banks - providing payment services to other institutions. However, there are reasonably wide variations in the degree of tiering and concentration. Data are limited and partial. Table 1 illustrates the extent of tiering and concentration within most of the main systems in CPSS countries.

There are some indications that, in some countries and in certain markets, more highly concentrated or tiered payment arrangements have developed. For example, in the United Kingdom, a recent merger brought together the banks accounting for 20% and 10% of flows through CHAPS respectively, although the merger is not yet operationally complete, so the implications for payment flows are not yet clear. Mergers in the Swiss market have reduced the number of major payment banks to two. The market for clearing US Treasury securities has likewise reduced to two major firms which, as a result of mergers and acquisitions over a period of years, now account for more than 70% of securities-related settlements in Fedwire. In Japan, the risk management costs associated with the new FXYCS have encouraged a larger number of banks to access the payment system indirectly, reducing the number of direct participants to less than 20% of the previous total. And in Belgium, tougher access criteria and higher entry fees introduced in the ACH have also encouraged an increase in tiering in this system.

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[23] For example, this would occur where there was a merger between two non-participants which had previously used different direct participants, or where there was a merger between a direct participant and a non-participant that had previously used a different direct participant.

[24] In other words, settled on a direct participant's own books between two of its own customers.

Table 1

Tiering and concentration in selected payment arrangements

Tiering by number of institutions: number of banks that are not direct participants relative to all domestically located banks.
Tiering by value of payments: percentage of total payments originating from banks that are not direct participants.
Concentration: percentage of volume/value of payments accounted for by the five largest direct participants in the system.
In many cases the descriptions are estimates.

Name of system	Tiering		Concentration	
	By number of institutions	By value of payments (e)	By volume of payments	By value of payments
Belgium				
Ellips	high	low	82%	86%
Euroclear*	nap	nap	nav	nav
Canada				
LVTS	high	nav	84%	82%
CDS debt*	high	nav	90% (e)	90% (e)
Eurosystem				
TARGET	high	mixed	nav	30% (e)
EURO1	strong	mixed	nav	nav
France				
TBF	mixed	mixed	46%	56%
PNS	strong	mixed	60%	56%
RGV/Relit*	mixed	mixed	nav	nav
Germany				
RTGS^{plus}	strong[1]	nav	nav	nav
ELS	low	nav	nav	nav
Clearstream Frankfurt*	high	nav	nav	nav
Hong Kong SAR				
HKD RTGS	none	none	nav	48%
Italy				
BI-REL	low	low	36%	39%
LDT*	mixed	mixed	nav	nav
Japan				
BOJ-NET	high[2]	none	18%	33%
FXYCS	strong	low	65%	61%
Zengin	high	low	40%	56%
TCH-BCCS	high	nav	47%	69%
Netherlands				
TOP	low	low	73%	72%
Singapore				
MEPS	mixed	nav	55% (e)	49% (e)
Sweden				
K-RIX	high	low	90%	90%
VPC*	high	mixed	"high" (e)	"high"(e)
Switzerland				
SIC	low	low	55%	68%
United Kingdom				
CHAPS Sterling	strong	mixed	82%	79%
CHAPS Euro	high	mixed	72%	84%
United States				
Fedwire funds	mixed	mixed	32%	44%
Fedwire securities*	mixed	mixed	79%	82%
CHIPS	strong	mixed	54%	60%

Descriptions of degree of tiering (number of institutions): none = all or virtually all domestically located banks are direct participants in the system (or exceptions to this are not significant); low = at least 75% are direct participants; mixed = 25-75% are direct participants; high = 5-25% are direct participants; strong = less than 5% are direct participants.

Descriptions of degree of tiering (value of transactions): none = all or virtually all payments by value are accounted for by direct participants themselves (rather than by other domestically located banks using these direct participants); low = at least 90% of payments by value are accounted for by direct participants; mixed = direct participants account for 25-90%; high = direct participants account for 10-25%; strong = less than 10% of payments by value are accounted for by direct participants.

Selected systems that handled more than USD 5,000bn equivalent in 2000. For more details see Table C in Annex 3. * indicates payments relating to a securities settlement system. (e) = estimate. [1] Tiering is "strong" due to the continued existence of ELS. [2] "High" tiering is due to cooperative banks not having access to accounts at the Bank of Japan.

This trend is not universal - as would be expected, given that some of the developments identified earlier will tend to reduce the cost of direct access to the payment system and so reduce the level of tiering. For example, the advent of liquidity saving features and intraday finality has led to decreased tiering in the new CHIPS in the United States as non-settling participants have become full participants. Nevertheless, as identified in the Ferguson Report, the trend does seem to exist.

2.3 Conclusion

The sorts of developments explored in this section raise various policy issues for central banks. Such issues typically arise from the cumulative effect of a wide range of developments of varying importance rather than any one single development. Indeed, while this report has focused on forces that have caused changes in payment systems directly, some issues have been triggered even when there have been no specific changes in payment systems themselves.[25] In order to understand where and why such policy issues might arise, it is important first to understand central banks' current policies in this area, and how these policies were determined. Indeed, because many of the developments discussed are not new, current policies are already influenced by them to some extent. Section 3 thus reviews current policies. Section 4 then assesses possible continuing implications of recent developments for these policies.

3. Current central bank policies

While they may articulate their policy foundations in different ways, central banks typically distinguish between two questions: for which systems should they act as settlement institution, and which institutions should have access to settlement accounts (and on what terms). Section 3.1 addresses the first question, and provides further detail on individual central banks' policies, while Section 3.2 addresses the second. (More details of central banks' policies are contained in Annex 1.)

3.1 Settlement in central bank money by systems

As noted in Section 1.3, both central and commercial bank money can be used as a settlement asset. In practice, most - although by no means all - interbank payment systems use the central bank as the settlement institution and thus the direct participants in these systems use central bank money as the settlement asset.[26] The arguments in favour of a central bank being the settlement institution fall into five broad categories. They are:

- ***risk*** - the use of a risk-free settlement asset can help reduce systemic risk;
- ***service continuity*** - the use of a default-free settlement institution can limit the risk of service interruption;
- ***liquidity*** - the ability to create unlimited liquidity in domestic currency may be important for the smooth operation of the system;
- ***competitive neutrality*** - the use of central bank money means participants do not have to rely on a competitor for settlement services;
- ***efficiency*** - the use of a single settlement institution to settle different sorts of transactions may enable participants to economise on, for example, liquidity usage.

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[25] Three examples of possible exogenous triggers may be briefly noted: first, the development in recent years of international standards to encourage financial stability, such as the Core Principles and SSS recommendations; second, significant institutional changes, such as the creation of the Eurosystem or the transfer in some countries of the function of banking supervision into a separate regulatory body; and, third, specific events, such as the terrorist attacks of 11 September 2001, which led to renewed concern over possible concentrations of payment flows which may be vulnerable to disruption.

[26] See Annex 3, Table C for information about settlement in selected payment systems and arrangements.

These arguments - particularly the first three - are most potent in the case of SIPS, where the values transferred are very large in relation to the balance sheets and capital resources of at least some of the direct participants. The failure of the settlement institution in a SIPS could cause serious and widespread disruption within the financial system and thus the economy as a whole, both because of exposures of the direct participants to the settlement institution (where they had credit balances) and because the SIPS would be unavailable until alternative settlement arrangements could be put in place.

This disruption could occur regardless of the cause of the settlement institution's failure. To the extent that the settlement institution provided credit to the direct participants in the SIPS, the failure of one of the participants with a debit balance could be the cause of the settlement institution's failure. In that way the settlement institution could cause problems to be propagated between the participants. Or, particularly where the settlement institution was a commercial bank, the failure might be the result of activities unrelated to the payment system. The settlement institution could thus cause outside problems to be propagated within the SIPS. Again, these dangers emphasise the importance of the soundness of the settlement institution for SIPS and hence for the economy at large.

Accordingly, central banks have a clear collective policy on the use of central bank money as a settlement asset in SIPS. Core Principle VI stipulates that, for such systems, "assets used for settlement should preferably be a claim on a central bank; where other assets are used, they should carry little or no credit risk and little or no liquidity risk". This reflects the collective decision that high concentrations of such risks should be eliminated or significantly reduced by requiring those systems to settle in a "safe" asset. Likewise, SSS Recommendation 10 states that the assets used to settle the ultimate payment obligations from securities transactions should carry little or no credit or liquidity risk and that, if central bank money is not used, steps must be taken to protect members of the central securities depository from potential losses and liquidity pressures arising from the failure of the settlement institution whose assets are used.

But even here some discretion is allowed. The Core Principles and the SSS recommendations recognise that - as noted in Section 1.3 - "safety" is not the sole prerogative of central bank liabilities, that the use of central bank money by large-value systems is not always practicable (eg where cross-border or multicurrency payments are involved), and that other issuers of settlement assets could be sufficiently well protected to adequately mitigate risk within the system.

A number of significant systems do in fact currently settle in commercial bank money - including the ones described in Box 3. The relevant central banks' willingness to permit these arrangements sometimes reflects their acceptance that settlement in central bank money is difficult to achieve because of the need to offer multicurrency facilities (eg where there is insufficient overlap of the opening hours of central banks in different time zones or remote access is not allowed). In other cases it reflects their acceptance that the system and its direct participants have chosen to settle in commercial bank money. However, for those systems that are systemically important, steps have been taken to limit the risk of issuer default. For example, CLS Bank's design incorporates risk controls which meet internationally recognised standards, and funding and defunding of participants' accounts takes place across the relevant central banks' accounts.

The central bank's competitive neutrality and the efficiency gains from using a single settlement institution for multiple systems might also be used to justify the provision of its settlement services to significant but non-systemically important systems such as the principal retail clearing systems or the card networks. However, central banks' policies in relation to such systems are somewhat more diversified. This is in part because, while the factors listed above might point towards a broad role for the central bank as settlement institution, there are important counterarguments to the central bank providing this service in all circumstances. For example,

- ***market choice and competitive distortion*** - all CPSS central banks place significant reliance on market forces to ensure the provision of financial services. It is possible that the provision of such services by the central bank to private sector systems and institutions could in some circumstances disintermediate commercial providers of accounts and related services. Clear public policy grounds are needed to justify discouraging the emergence of a market-oriented solution.
- ***risk to the central bank*** - provision of credit to the system's participants puts public funds at risk. But the system may require credit to operate efficiently. In general, only clear public policy grounds would justify this. In non-SIPS such grounds may be less persuasive.

- ***moral hazard*** - as noted in Section 1.3, the provision of account facilities could encourage the misperception that the account holder was within the central bank's "safety net".

As examples of policies, the Deutsche Bundesbank, the Netherlands Bank, Sveriges Riksbank and the Swiss National Bank accept and even encourage settlement in central bank money within most or all systems, regardless of the values passing through them. In similar but not identical vein, the ECB recently issued a consultation document which, while not actively encouraging all systems to settle in central bank money, stated that where retail payment systems are not of systemic importance, settlement in central bank money is not obligatory but is allowed (and in fact most such systems in the euro area do settle in central bank money).[27, 28]

The Federal Reserve offers its (net) settlement services to all deposit-taking institutions and their related clearing organisations, without drawing distinctions between SIPS and non-SIPS. The Federal Reserve believes that its provision of services in this area ensures the integrity and efficiency of settlement for the wider economy, fosters the accessibility of settlement services and competition in the provision of private clearing services, and enhances the soundness of financial institutions.

The Bank of England draws a distinction between those non-SIPS for which it is willing to act as settlement institution and those for which it is less inclined to do so. In a recent policy statement,[29] the Bank identified, as a distinct category, "systems of system-wide importance" (SWIPS), for which it is willing to act as settlement institution without insisting on doing so. Such systems are of importance to the economy as a whole, are widely used and have few short-term substitutes. Although they would be unlikely to generate or transmit financial instability, they could cause considerable disturbance to the economy as a whole. However, the Bank is not normally willing to act in this capacity for systems which are neither SIPS nor SWIPS (although it would be prepared to consider the case for doing so, for example on neutrality grounds).

3.2 Provision of central bank money to individual institutions

Closely related to the question of which systems settle in central bank money is the question of which institutions have accounts at the central bank and whether they are allowed access to credit on that account.[30] Clearly, in a system that settles in central bank money, an institution can only be a direct participant, responsible for its own settlement, if it has access to an account at the central bank. Moreover, as noted earlier, access to an account without credit may be of relatively little value.

The provision of accounts to banks has historically been a core aspect of central banking, and it remains at the heart of CPSS central banks' banking activities. However, few central banks limit accounts strictly to banks. Indeed, some provide accounts to a very wide range of financial and even non-financial institutions. The extent to which each is prepared to broaden the population of account holders, and to make available to those account holders accompanying services, reflects each central bank's judgment as to what weight to place on a range of policy considerations.

Those considerations are very similar to those determining which systems should settle in central bank money. In some countries these considerations are largely determined by legislation and the central bank is constrained by statute as regards those to whom it may provide accounts. However, whether set by central bankers or politicians, the considerations are broadly the same across CPSS countries.

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[27] *Oversight standards for euro retail payment systems*, European Central Bank, July 2002.

[28] The Eurosystem's view is that retail payment systems may, but need not, be systemically important. Those that are would be expected to comply with the Core Principles. Others would be expected to comply with the recent policy statement, once finalised. For example, the Bank of France has concluded that the principal French retail payment system is systemically important.

[29] *Bank of England settlement accounts*, Bank of England, November 2002.

[30] For the purposes of this report, accounts referred to in this section are accounts held with the central bank that can be used for settling obligations within a payment system.

Box 3

Systems where settlement involves commercial bank money

This box provides a brief explanation of how settlement takes place in five systems where commercial bank money is involved.

CLS

CLS Bank (CLSB) is an Edge Act Corporation, based in New York and owned by approximately 70 financial institutions. Each direct participant ("settlement member") in CLS holds an account at CLSB which is divided into sub-accounts, with one sub-account for each currency that CLSB settles (currently the US, Australian and Canadian dollars, euro, yen, pound sterling and Swiss franc). Members start and end each day with zero balances on these accounts and sub-accounts.

Foreign exchange deals are settled one by one (gross) on these accounts by simultaneously debiting the sub-account of the currency being sold and crediting the sub-account of the currency being bought. Settlement thus takes place in "CLSB money", with members accumulating debit balances in currencies where overall they and their customers are sellers and credit balances in those where overall they are buyers.

CLS draws a key distinction between this gross settlement process and the net funding by members of those sub-accounts in which they have debit balances. Where they accumulate debit balances, members have to pay in funds to CLSB in order to restore their sub-account in that currency to zero by the end of the day. Correspondingly, CLSB makes payouts to members with net long positions. These pay-ins and payouts are made using RTGS systems or their equivalent to transfer funds to and from accounts CLSB holds at the central banks of the currencies concerned. Central bank money is thus used in the funding and defunding process, which is an integral part of the overall CLS settlement process because of the requirement that members start and end each day with zero balances at CLSB.

For the Canadian dollar and pound sterling, CLSB accesses the central bank and thus the corresponding interbank payment system as a customer of the central bank. In other currencies, CLSB is a direct participant in the system used. Since it participates from New York, CLSB represents a significant case of remote access for the Australian dollar, euro, yen and Swiss franc systems.

Euroclear

Since 2001, the Euroclear system has been operated by Euroclear Bank, a Belgian credit institution acting as a limited purpose bank. As an ICSD, Euroclear provides settlement services, as well as depository and custody services, for international and domestic securities issued by entities from over 110 countries.

Euroclear has about 2000 participants from more than 80 different countries, the vast majority of which are banks, broker-dealers and other institutions engaged in the issuance of securities, the provision of custody services, market-making and trading in securities. Each participant holds both cash and securities accounts at Euroclear Bank, which provides them with settlement-related banking services, including credit, foreign exchange, securities lending and borrowing and collateral management services. Intraday credit is generally free of charge, but interest charged on overnight credit is typically above the market rate, which limits its use. Conversely, since no interest is paid on cash balances held with Euroclear Bank, they are generally low. Credit extensions are generally fully collateralised.

Trades are settled by book entry on a simultaneous DVP (Model 1) basis. Whilst a majority of trades settled are denominated in euros, Euroclear also settles in more than 40 other currencies. More than 90% of settlement takes place in the overnight batch process using commercial bank money. But Euroclear also offers a real-time daylight settlement process in which participants may, in principle, choose to settle euro-denominated transactions in either commercial or central bank money, the latter across accounts of the National Bank of Belgium (NBB). However, because most Euroclear participants are located outside Belgium and the NBB only provides credit to institutions in Belgium, the option to settle in central bank money is little used in practice. Settlement of non-euro denominated transactions takes place only in commercial bank money for efficiency reasons, including the practical difficulty of accessing non-euro area central bank accounts (eg due to non-overlapping operating hours) and central banks' policies on access to accounts and credit.

Clearstream

Cedel was founded in 1970 to provide the clearing, settlement, custody and management of securities and precious metals. On 1 January 1995, with the intention of increasing the company's effectiveness, Cedel became Cedel Bank (and later Cedelbank) in order to allow its customers to take advantage of capital adequacy regulations. In January 2001, Cedelbank was renamed Clearstream Banking and now belongs to the Clearstream group of companies within the Deutsche Börse Group.

Box continued overleaf

Box 3 (cont)

Systems where settlement involves commercial bank money

Clearstream has about 1,500 customers from more than 100 different countries, the vast majority of which are banks and other institutions engaged in the issuance of securities, the provision of custody services, market-making and trading in securities. Each participant holds both cash and securities accounts at Clearstream, which provides them with settlement and custody-related banking services, including credit, foreign exchange, securities lending and borrowing and collateral management services. Intraday credit is generally free of charge, but interest charged on overnight credit is typically above the market rate, which limits its use. Credit extensions are generally collateralised.

Trades are settled by book entry on a simultaneous DVP (Model 1) basis. Whilst most trades settled are denominated in euros, Clearstream also settles in more than 30 other currencies. Most settlement takes place in the overnight batch process using commercial bank money. Since the second half of 2002, the Central Bank of Luxembourg together with Clearstream has offered a new service to Luxembourg-based banks participating in Clearstream's overnight processing, the so-called Night Time Link. It should be noted that with this procedure, cash credit granted by Clearstream to customers overnight is collateralised by central bank money. Settlement of non-euro denominated transactions takes place only in commercial bank money for efficiency reasons, including the practical difficulty of accessing non-euro area central bank accounts (eg due to non-overlapping operating hours) and central banks' policies on access to accounts and credit.

US dollar and euro RTGS systems in Hong Kong SAR

In Hong Kong there are two RTGS systems that settle foreign currency (namely, the US dollar and the euro). The Hong Kong Monetary Authority (HKMA) appointed the Hongkong and Shanghai Banking Corporation (HSBC) as the settlement institution for the US dollar RTGS system for five years from August 2000, and Standard Chartered Bank as the settlement institution for the euro RTGS system for five years from April 2003.

In both systems, all transactions are settled in real time on a gross basis across the books of the relevant settlement institution. Participation in the systems is voluntary. Banks which choose to use the systems are free to do so as either direct participants or via a correspondent bank.

The systems are used mainly as an alternative to traditional cross-border correspondent banking arrangements for the settlement of the US dollar and euro legs of commercial remittances and foreign exchange transactions. Real-time links between the Hong Kong dollar RTGS system (which settles on accounts at the HKMA), the US dollar RTGS system and the euro RTGS system allow counterparties to a USD/HKD, EUR/HKD or USD/EUR foreign exchange trade in the Asian region to settle both sides of the trade simultaneously.

Once again, a key objective is to mitigate high concentrations of credit, liquidity and operational risk by providing a safe, liquid settlement asset and a high degree of assurance of service continuity. Another is to treat financial market participants in an even-handed manner and in some circumstances to permit access to a competitively neutral settlement institution. Such considerations might, on the face of it, imply fairly wide provision of central bank money. But a check is provided by three further objectives: first, promoting a competitive banking industry in which innovation is encouraged, and therefore not unnecessarily disintermediating banks; second, limiting the risk borne by the central bank; and, third, avoiding moral hazard as far as possible. Accordingly, access to central bank money is restricted to circumstances where its special features are particularly valuable in terms of social costs and benefits, and thus limited to particular classes of institution.

3.2.1 Access to accounts

Banks

In practice, banks are generally the primary holders of settlement accounts. Banks' special status in this context reflects the fact that they are the principal providers of payment services in the economy, and banks providing payment services to other banks and non-banks account for the largest flows through most payment systems. All central banks provide accounts to banks, and Table 2 shows that, while there are exceptions, banks generally account for a high percentage of the value of overnight balances on central bank accounts.

Table 2

Percentage of balances on payment accounts at the central bank that are held by banks

Country	% of balances on payment accounts	Country	% of balances on payment accounts
Belgium	> 90% (e)	Netherlands	69%
Canada	100%	Singapore	9%
France	74%	Sweden	40%
Germany	99%	Switzerland	80%
Hong Kong SAR	100%	United Kingdom	approx 100% (e)
Italy	100%	United States	88%
Japan	85%		

Figures for 2000. For more details, see Table A3 in Annex 3. (e) = estimate

Precisely what constitutes a "bank" differs between countries. A common denominator across different jurisdictions is that an institution that simultaneously accepts deposit and provides credit is defined as a "bank". Several EU member states extend the requirement for a licence (and the definition of bank or, in EU legal terms, "credit institution") to institutions that grant credit but do not take deposits and those institutions may be granted access to central bank money. In the United States, "bank" is synonymous with depository institution, including both domestically chartered institutions and US branches and agencies of foreign banks. In Table 2 for the United States, the "bank" category also includes state-licensed trust companies that are members of the Federal Reserve System, such as the Depository Trust Company, and Edge Act corporations, such as CLS Bank; these types of institutions are also allowed to maintain an account.

In many countries, there are additional considerations. Limits on access to banks can also reflect a conscious desire to maintain a balance of privileges and responsibilities between regulated and unregulated institutions. In such countries, access to central bank accounts is regarded as part of a "package" of privileges and burdens given to banks. The "privileges" - including access to accounts and to credit, and in some cases participation in deposit insurance schemes and the ability to take part in monetary policy operations - are granted in part to give an incentive to institutions to undertake the "burdens" of banking regulation and supervision, including capital and reserve requirements.

Non-resident banks

While resident banks are core central bank customers, the same is not true of non-resident banks; indeed, until relatively recently no central bank allowed so-called remote access. The term "resident banks" refers to banks with some specified form of authorised establishment within the currency area, which may include banks with local branches but primarily chartered elsewhere. By contrast, non-resident banks have no such establishment. In line with the definition of resident and non-resident banks, remote access is defined to be where the holder of the account at the central bank has neither its head office nor any of its branches located in the country of the central bank concerned.

Prohibitions on remote access reflect a number of factors. A first argument is the risk for the central bank. Dealing with non-resident banks subject to other countries' laws and regulations can be more risky, since the effect of overseas laws is more difficult to predict and may be inconsistent with domestic law. Although dealing with local branches of overseas banks can generate similar risks, those risks may be easier to contain in part because they are generally subject to domestic law. It may be more natural to maintain a relationship with resident institutions, with which the central bank is more likely to interact in other contexts. Where the account holder has access to credit (see below), the central bank may feel less able to rely on the effectiveness of overseas supervisory regimes to help protect its position. A second argument lies in the balance between incentives and regulatory costs to the resident banking industry. Resident banks safely extend the use of the currency within the central bank's jurisdiction by providing retail payment services to the general public. They are subject

to supervision by the local authorities. These resident banks in turn have the business opportunity to provide access to the currency and payment services to non-resident banks (correspondent banking). Remote access, by relaxing the link between "location" and "access to the central bank", could change this balance of incentives and costs.

However, in recent years this approach has changed in some countries, not least because globalisation has increased the use of currencies outside national boundaries. This is perhaps most evident in Switzerland, where since 1998 the Swiss National Bank (SNB) has allowed remote access to SIC (the Swiss RTGS system) for international joint ventures and clearing organisations, as well as for the banks that are direct participants in such arrangements, provided they make a sizeable contribution to the reduction of systemic risk or are of major significance to the Swiss financial centre. For reasons of legal and operational security, this applies only to institutions from countries which have at least the same standards as Switzerland with respect to banking supervision, the fight against money laundering and telecommunications infrastructure. In order to smooth the settlement of payments in SIC, remote participants are allowed intraday credit. They can also participate in the SNB's money market operations and can now also obtain overnight lombard credit (although in practice only one remote participant has so far established a lombard credit line.)

The SNB's policy towards remote access partly reflects a view that globalisation, competition between European financial centres and cross-border mergers have made traditional access policy outdated. It also reflects two more specific developments. The first of these was the merger in 1998 between two of the three big Swiss banks, which gave rise to concern about concentration and reduced liquidity in the Swiss franc money market; remote access was seen as a way to encourage non-resident banks to become more active in Swiss markets and thus increase competition. The second development, also in 1998, was the merger between the Swiss SOFFEX exchange and Deutsche Terminboerse (DTB) to form Eurex. SOFFEX was linked to SIC to enable margin calls to be paid; to enable the same facility to be used in Eurex, the many German banks that participated in DTB had to be given remote access.

In the European Union, Eurosystem central banks do not allow remote access to settlement accounts by non-EEA-resident institutions but internally, that is within the European Economic Area (EEA), they do allow remote access to accounts.[31] Sveriges Riksbank and the Bank of England go further for their own currencies, also allowing access by non-EEA-resident banks where assurance can be provided (through legal opinions) that no unacceptable conflicts of law exist. But in practice usage is very limited.

However, it is worth noting that the distinction between the policy of only allowing foreign-owned banks to have an account if they are resident in the country and the policy of allowing remote access is not always clear cut. There are a number of intermediate cases where a foreign-owned bank may have a local branch, entitling it to an account at the host central bank, but where all or part of the operation of that account is managed remotely (eg by a centralised treasury operation in another country or even outsourced to a third party that is remotely located). For example, this is allowed on a case by case basis in Japan.[32] In the United States, such activities are allowed under the Federal Reserve's broader policy of permitting the outsourcing of account services.

Non-banks

Payment services are provided by an increasingly wide range of institutions. Non-bank financial and even non-financial institutions are increasingly assuming responsibility for managing their own and their customers' payments.

One possible policy decision to address this development, albeit one often not directly within the authority of the central bank, is to expand the coverage of the banking licence to these providers of payment services. Many, such as the larger securities firms, already compete directly with banks in a

[31] In the European Union, legislation underpinning the single market imposes very strict limits on how far member states can impose distinctions based on location for institutions resident in the EEA. (The EEA consists of the EU member states plus Iceland, Liechtenstein and Norway.) Accordingly, all EU central banks allow access by non-resident banks (and certain other institutions) provided they are resident in the EEA, although in practice restrictions on the provision of credit (see main text below) mean that use of the possibility is limited for accounts in euros.

[32] Institutions with this form of remote access are required to have the front-end-processor and at least one BOJ-NET terminal in Japan.

number of areas and account for large values of payments. While it is true that the "burden" of being supervised is no longer applied exclusively to banks, in many cases regulation of banks remains tighter than that of other institutions. By bringing such non-banks within the coverage of a banking licence they would become subject to the corresponding costs (such as tighter regulation) and benefits (such as access to a central bank account).

Another possible policy decision, not in contradiction with the previous one and followed by many central banks, is to be prepared to provide access to categories of non-banks, particularly where their activities can result in highly concentrated exposures which might be mitigated by providing such institutions with central bank money or where there are efficiency or competitive equality issues because such institutions compete directly with banks in providing payment services to both banks and other non-banks. These arguments are considered in more detail in Section 4.

The range of other types of financial institutions to which access is extended varies from country to country.[33] For example, most central banks provide, or would be willing to provide, settlement accounts to clearing houses to facilitate settlement of obligations to and from their direct participants. Many are prepared to allow securities firms to open accounts to settle payment obligations arising from settlement systems in which they are a direct participant as a way to enable central bank money to be used for these transactions. Some provide accounts to other types of non-bank financial institution, such as insurance companies or non-bank credit card issuers. And a few provide accounts to certain other types of non-financial institution, for example operators of automated teller machines.

Aside from financial institutions, most central banks have traditionally provided accounts to the central government. In addition, in Germany, France and the United Kingdom, certain firms and companies hold grandfathered accounts at the central bank, although new accounts are now generally not allowed. In France, Germany, Switzerland and the United Kingdom, central banks' own employees are also granted access to central bank accounts.

The Swiss National Bank allows access to a wide range of financial institutions, whether resident in Switzerland or not. In contrast, the HKMA limits access to resident banks (including restricted licence banks). The Federal Reserve generally confines access to institutions with a banking or similar licence, including both domestically chartered institutions and US branches and agencies of foreign banks.[34] However, a clearing house may have access to an account if it has such a licence, as is the case for CLS Bank, or if the account would be maintained in the name of participants in the clearing arrangement that have such licences, as is the case for CHIPS. While the Eurosystem has a uniform policy towards allowing accounts for credit institutions in the EEA, each national central bank may at its own discretion decide whether or not to allow accounts to securities firms (or "investment firms", as defined by EU legislation) and/or clearing houses. In practice, most national central banks do allow these accounts. The Bank of England's policy is that in principle any direct participant in a system for which the Bank is settlement institution should be allowed to have an account and that non-resident banks should have the same facilities as resident banks provided they are appropriately supervised and contingent on the provision of assurances regarding compatibility of legal systems.

In practice, all central banks allow themselves an element of discretion in this area. The types of payment for which an account can be used may be circumscribed, both by the systems of which the account holder is a direct participant, but also by conditions applied by the central bank.[35] And access to an account may well be conditional, for example non-resident banks may need first to provide assurances regarding compatibility of legal systems.

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[33] For more detailed information, see Annex 3, Table A1.

[34] Institutions with similar licences include state-licensed trust companies that are members of the Federal Reserve System and Edge Act corporations. The Federal Reserve also has a limited selection of other account holders, including government entities, other central banks, international financial institutions and certain government-sponsored institutions, such as the Federal Home Loan Banks.

[35] In the United Kingdom, for instance, an account opened by a CREST settlement bank could not be used to settle payments that were not related to securities transactions, even where the account holder was a direct participant in both systems; in addition, different conditions might apply to CREST and CHAPS accounts, for example, on access to credit.

3.2.2 Access to credit

For many institutions, particularly direct participants in large-value interbank payment systems, access to an account may be of little or no use without access to credit,[36] so the central bank's policy on the latter is an important element of its overall access policy. Indeed, once allowance is made for the fact that, where no credit is available, few institutions typically opt to open an account, some of the apparent differences in access policy are less strong. Particularly relevant in the euro area is access by securities firms, where intraday credit is generally limited, and remote access by banks, where no intraday credit is available. In both cases, little use is made of central bank accounts.

There is broad uniformity in central bank policies towards resident banks, in that in general they are provided with both intraday credit in RTGS systems and overnight credit.[37] However, there is less uniformity about providing credit to non-bank financial institutions. In many cases, where these institutions are allowed an account they are also allowed intraday credit. The most common exceptions to this are clearing houses (which often do not need credit anyway). Another qualification, just mentioned, is that the Eurosystem allows euro zone central banks to provide intraday credit to resident securities firms but the credit is limited unless a guarantee is provided by a resident bank.[38] This reflects the fact that the Eurosystem, while ready to open accounts for non-banks, does not want to disintermediate banks in the provision of credit. Moreover, the Bank of England would allow non-bank regulated firms access to intraday credit only where the scale of their own payment activities would make them significant direct participants in a SIPS and where it is persuaded that such participation would reduce risk for the financial system. There is also less uniformity about whether non-bank financial institutions are entitled to overnight credit as well as intraday credit.

Turning from financial institutions to a broader set of institutions, while there are exceptions it is typically the case that credit is not provided. Entities which have access to accounts but not to credit generally include the government, other central banks and international financial institutions. This reflects in part the fact that such entities are not direct participants in the payment system and thus that their need for credit from the central bank is less pressing, and in part the broader reasons why central banks limit the provision of credit, as mentioned below.

Central banks limit the provision of credit for a number of reasons. As noted in Section 3.1, only clear public policy grounds justify putting public funds at risk. In practice, the central bank may not have total discretion in how far to "unbundle" the provision of credit from access to an account: for large-value interbank payment systems, direct participants' access to credit is often essential for the smooth operation of the payment system and to avoid payment gridlock. Nevertheless, credit is generally provided only to a limited set of account holders, where necessary to ensure the orderly flow of payments.[39]

Where central banks provide credit they are potentially exposed to credit risk and consequently they require collateral, set limits and/or charge fees. This alone may limit the population of account holders to some degree, particularly where the central bank only treats a limited range of collateral as eligible. Moreover, like any financial institution, central banks carry out various forms of credit assessment of those to whom they are exposed. Supervision is a form of credit risk assessment. So, as noted above,

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[36] A survey recently carried out by the Eurosystem central banks confirmed that most large financial institutions view access to credit as critical to the effective operation of a settlement account.

[37] For more information about central banks' policies on providing credit, see Annex 3, Table A2.

[38] If a national central bank decides to grant credit to securities firms, each securities firm can choose between two modalities. They may obtain unlimited intraday credit if the credit is guaranteed by a resident bank. Alternatively, they may obtain intraday credit without a bank guarantee, but only up to an individual cap imposed by the central bank according to the risk profile of the securities firm.

[39] This section considers the provision of *intraday* credit for payment system participants. It does not address the factors which determine which institutions should have access to routine overnight credit or be eligible as counterparties for open market operations or their equivalent. For information, however, the latter is typically provided to a different set of institutions. In some countries, this will be a subset of those with access to intraday credit. In others (such as the United Kingdom), a broader population of counterparties have access to overnight than to intraday credit - for example, the Bank of England's counterparties for open market operations include securities firms. In the Bank of England's case, this reflects the view that overnight credit tends to be more susceptible to control by the central bank, is typically lower in value, and is less useful as a means of dealing with rapid withdrawals of funding and hence carries less moral hazard.

most central banks limit access to settlement accounts, at least those accompanied by credit, to "supervised" institutions - at a minimum, resident banks.

Monetary policy considerations may discourage central banks from giving intraday credit to institutions that are not monetary policy counterparties. Views differ on this. Some central banks believe that any potential linkage between the provision of intraday liquidity to payment system participants and the conduct of monetary policy can be avoided by, for example, a penalty charge to discourage borrowers from failing to repay intraday credit at the end of the day (thereby limiting the risk of "spillover" into overnight credit in a way that might threaten the implementation of monetary policy). Others consider that the failure to repay intraday credit by close of business is not only a realistic possibility but may also have adverse consequences for the operation of monetary policy; if so, it is desirable to limit the number of institutions that are given credit.

Moral hazard is also relevant here as elsewhere. This report has already noted the possibility that holders of settlement accounts may be misperceived to be within the "safety net" and hence likely to be eligible for emergency credit. This may be particularly so where access to an account is accompanied by access to routine credit.[40] Moreover, intraday credit facilities could be used to meet unforeseen outflows of funds, albeit only for a very short period. Where that happened, the central bank would be acting as, in effect, lender of *first* resort, which it may well prefer not to do.

Finally, broader policy objectives can affect policy choices. For example, the Eurosystem operates on the principle of decentralisation, and therefore avoids policies which might encourage the centralisation of operations within particular central banks. One consequence is that euro area central banks are prohibited from granting intraday or overnight credit to institutions resident elsewhere in the euro area, on the grounds that allowing this might encourage activity to migrate to certain central banks.

3.3 The relationship between policy on systems and policy on institutions

As noted earlier, while central banks typically distinguish between their policy towards systems and their policy towards institutions, the two policies are, of course, not independent. This subsection looks at two issues that show how these policies are related.

3.3.1 The requirement for individual institutions to settle in central bank money

Policy towards settlement by individual institutions in central bank money is generally framed in terms of who is *allowed* to have an account. Usually there is no *requirement* that central bank money be used. In other words, institutions that are allowed an account usually still have a choice between direct and non-participation in an interbank payment system. In this sense, policy towards institutions is somewhat different from policy towards systems, where, at least for SIPS, there is a requirement that a suitably safe settlement asset, preferably central bank money, be used.

It is true that in some economies all banks are required to have an account at the central bank, but usually this is because of reserve requirements. It is also true that in some economies all or virtually all banks are direct participants and thus settle in central bank money, but typically this is a matter of standard practice rather than a requirement (although sometimes of course the distinction can be blurred). Hong Kong SAR is to some degree an exception from these general positions in that banks are required to have a settlement account for payment purposes and are expected to use it.[41]

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[40] On the other hand, moral hazard might arguably be reduced by offering very wide access, which could limit the possibility of such misperceptions arising in the first place.

[41] Among other countries, Australia was also an exception until recently. When RTGS was introduced in Australia in 1998, all banks were required to settle their RTGS transactions directly through their own settlement account at the Reserve Bank of Australia (RBA). However, following a review, that policy has recently been changed so that banks with few transactions (defined as less than 0.25% by value of all RTGS transactions) may in future settle indirectly, although they still need to keep an account at the RBA for use in a contingency. Any bank wanting to settle indirectly (or to settle directly but provide services to other banks that want to settle indirectly) must obtain prior approval from the Australian Prudential Regulation Authority, which will be based on an assessment of the operational risk and liquidity management arrangements in place.

The relative lack of formal requirements partly reflects the (tacit or explicit) view that requiring banks to maintain settlement accounts is of little use without some means of requiring them to use those accounts for settlement purposes, and that the latter is difficult to achieve where, for example, it is not possible to identify where banks also use accounts with other banks for settlement purposes. But it also reflects the view, or the implicit assumption, that policy objectives can be achieved without taking this additional step, because most significant banks will choose to become direct participants in the payment system and to hold accounts at the central bank. In other words, the broad objective of having central bank money play a pivotal role in the payment system can be achieved without a specific policy of requiring direct participation. As already noted, it is in fact the case across CPSS countries that in practice most banks, or at least large banks, use accounts at the relevant central bank to settle most large-value payments. However, as described in Section 2.2.2 there are some significant exceptions already, and in the future there is a possibility that there could be increased tiering.

Any concentrations of activity caused by tiering are not necessarily destabilising, and any implications for central banks' risk objectives need to be set against countervailing efficiency benefits to market users. But in markets where tiering is marked the central bank is, other things being equal, more likely to want to review the appropriateness of its policy in this area, and the extent to which broader risk objectives are met.

3.3.2 Criteria for direct participation in systems

The analysis in Section 3.2 concentrated on central banks' policies on access to settlement accounts. However, in payment and settlement systems that are not operated by the central bank but settle in central bank money, the system's participation criteria may not necessarily coincide with the central bank's account criteria. Many systems apply additional criteria (eg operational criteria), and some apply stricter criteria. For example, CLS limits membership to financial institutions with a certain credit rating. Conversely, many securities settlement systems have a far broader range of members than would have access to central bank accounts. Such inconsistencies are not central to the analysis in this report. But it is useful to note that access to a central bank account is not a sufficient condition for being a direct participant in an interbank payment system, even when the central bank is the settlement institution. So central bank access criteria are not the only determinant of, for example, the degree of tiering within the payment system.

There is also an interesting distinction between those central banks which apply criteria in the expectation that they will be the prime determinant of who has access to the payment system, and those which do not. In most cases, an account with the settlement institution is the key prerequisite of membership of the interbank payment system. Not all central banks take this approach. The Bank of England's policy, for example, is to offer accounts (although not necessarily credit) to any direct participant in the payment system for which it acts as settlement institution. Even so, the Bank reserves the right to apply discretion case by case.

3.4 Conclusion

As noted, there is much common ground in central banks' policies on which systems should settle in central bank money - common ground represented by the Core Principles and the SSS recommendations, as well as the reality that in practice most systems do settle in central bank money. Where there are variations in approaches to which systems should be required or allowed to settle in central bank money, they typically reflect variations in the importance attached to considerations such as neutrality, efficiency in the use of liquidity or the degree to which alternative assets are considered sufficiently safe.

There is also much common ground on policy towards institutions, both in terms of banks being central banks' core customers and in the importance of providing credit. Where there are variations here, they reflect specific judgments as to the implications for the financial system, and for the central bank, of permitting broader or narrower access to accounts and to intraday credit. Other things being equal, permitting or even encouraging broader access to accounts may help reduce worrying concentrations of activity and risk. It may also limit the potential for inconsistent treatment of functionally similar institutions. Equally, it may affect the degree of competition for payment services, may require the central bank to extend larger amounts of credit to less creditworthy institutions and may generate moral hazard.

4. Possible implications for central bank policy

Developments such as those highlighted earlier in the report can be an important catalyst in causing central banks, as a matter of good practice, to review the policies set out in the previous section. Such reviews are likely to reflect two broad concerns.

First, developments which encourage greater concentration of activity, and perhaps migration of payment flows away from the top tier of the payment system, could generate concentrations of credit, liquidity or operational risk and greater reliance on less safe settlement assets. Second, some of these developments may be evidence of avoidable costs in the payment process, or of inconsistencies in the treatment of functionally similar market participants, which in part reflect central bank policies.

In either case, the question for central banks is whether those risks and inefficiencies are evident; and if they are, whether they might be avoided through a change in policy, and at what cost, for example in terms of risk borne by the central bank.

In practice, these questions are generally articulated in three broad ways:

- Given the range of developments affecting the clarity of the distinction between those currently allowed access to central bank accounts and credit, and certain types of institution that are not, should central banks re-examine their policies in this area?
- Given the focus among users (direct and others) and of central banks within the CPSS countries, both individually and collectively, on improving the design of interbank payment systems, both to reduce the costs and risks of using them and to broaden the range of services available from central banks or other operators of those systems, how should central banks move forward?
- Given the blurring, in some instances, between the activities of traditional interbank payment systems and correspondent banking services provided by large commercial banks, and the existence or emergence in some countries of highly tiered payment structures, should central banks review the scope of application of their policies, in particular in relation to their oversight activities?

Accordingly, the report now discusses the possible implications of the various developments for central banks' policies in each of these three areas.

4.1 Access policy

As Section 2 described, there are various categories of institution, including non-bank financial institutions and non-resident banks, whose importance in the payment system may be growing in some countries, but which are not in all cases allowed access to central bank money. Across CPSS countries, institutions that are not direct participants in interbank payment systems - whether securities firms and mutual funds in the United States, insurance companies in Japan, or SSS participants in the United Kingdom - are generating higher values and volumes of payments. In some countries, one immediate consequence has been requests for access to settlement accounts by specific institutions not previously or currently eligible.

Another consequence can be to concentrate flows of payments within a small number of correspondent banks and to shift the balance of activity away from the top tier of the payment systems. Such concentrations may become sufficiently marked for worrying exposures to exist. If so, one option may be, either in isolation or as part of a wider set of policy changes, to broaden the range of institutions allowed direct access to the settlement asset. The objective would be to allow, and indeed encourage, broader use of central bank money, if that can be done without adversely affecting market efficiency or simply transferring risk to the central bank.

Moreover, where such firms currently have to participate indirectly, this could impose avoidable costs on them, and perhaps in some cases hinder competition between direct participants and others in the provision of payment and related services. Such an outcome may not be optimal from an efficiency standpoint. And the application of different rules to functionally similar institutions raises questions over the objectivity and fairness of policy. Once again, the question for central banks is whether these costs or inequities are evident, and whether they might be avoided through a change in policy, and at what cost.

4.1.1 Relevant considerations

When reviewing policies on account access, the considerations set out in Section 3.2 are applied to the facts of the case. For each possible account holder, or class of account holders, the central bank needs to consider:

- the strength of the grounds for expanding access - such as whether permitting access better enables the central bank to achieve its objectives by eliminating concentrations of risk in the payments process, reducing costs and/or addressing an anomaly - compared to any counterarguments, such as any adverse impact on competition;
- whether the account holder would expect or require credit, and whether the central bank is prepared to provide it;
- in the event that credit were needed, what assurances of repayment the central bank might obtain (eg from the existence of an effective supervisory regime), and how it might protect itself from default (limits, collateral, third-party guarantees etc);
- the impact on moral hazard, and any means of limiting that impact;
- what precedents the provision of an account might set - whether the grounds are institution-specific or entire classes could be affected by the outcome.

To make such a judgment, the central bank will need a certain amount of information. It will want to understand the level of demand for accounts and credit from particular classes of institution, and whether that demand reflects (for example) the desire to avoid risk, to reduce costs, to avoid reliance on a commercial competitor, to receive equal treatment or simply to obtain the (perceived) imprimatur of the central bank.

Risk

As far as risk is concerned, the central bank will want to assess the financial exposures that exist. It will want to understand whether risks reflect *credit* exposures, with large values held on account with commercial institutions or large amounts of credit provided to customers; *liquidity* exposures, reflecting customers' reliance on commercial institutions to make large values of payments on their behalf; or *operational* risks reflecting reliance on a third-party bank to perform a critical business function. It will want to assess whether any exposures are such as to have systemic effects were they to materialise. It will want to consider how far non-participants are at least able to choose between a range of correspondent banks to intermediate on their behalf. And it will want to understand whether expanding access to settlement accounts would in fact have the desired effect of encouraging broader direct access to the payment system, and any negative consequences of that happening, perhaps stemming from lower use of institutions (commercial correspondents) with expertise in the provision of payment services and the financial resources to support their activities.

Costs

As far as costs are concerned, the central bank will want to understand what costs might be avoided through broader direct access to its accounts, and why that might be so. Costs might reflect a lack of innovation within the interbank payment system or among payment service providers, which it is felt wider participation in the payment system, and a broader intermediary role for the central bank, might help to address. If so, one question is why that inertia has arisen and how else it might be resolved. In any event the central bank may need a broad understanding of the cost structure within the payments industry, of the degree of competition between commercial payment service providers and of the governance of the principal systems.

Neutrality

Where those currently without access to accounts wish to use the central bank to avoid relying on (or providing information to) a commercial competitor, the central bank will want to establish the legitimacy of the concern and why it arises. The same applies where current policies appear to treat similar institutions in an inconsistent way. By implication, a certain blurring of functions has occurred, resulting for example in banks and non-banks, or even financial and non-financial institutions, competing directly in certain markets. The degree of overlap will be relevant to the central bank's decision, as will the particular disadvantages the current policy imposes on non-account holders.

Other considerations

In all these cases, the direct implications for the central bank will need to be examined. Probably the most important consideration here will be whether the account holder requires access to credit, and how much is likely to be needed. Moral hazard will also need to be addressed.

In some cases, direct access to central bank money may be requested to enable or facilitate the provision of a payment service (eg to facilitate the settlement of multilateral net amounts by a system operator or to allow a direct participant to make and receive payments arising from the clearing). The central bank will want to consider whether the use of central bank money for that service can be justified in such cases, given that there are very few (if any) services that cannot be provided without the use of central bank money. In principle, access to central bank liquidity is not a necessary condition for the provision of payment services. Non-banks still rely largely on the provision of liquidity by a licensed bank.

Alternatives

Central banks may also want to explore what alternatives might be available, particularly if extending access seems problematic. Such alternatives may already be in use in some cases. One alternative may be for non-bank issuers of money and providers of payment services to adopt a banking licence, hence acquiring the same privileges and responsibilities as existing banks. As regards clearing houses, they may not need an account themselves if central banks provide suitable settlement services to the direct participants in the systems for which they clear. Another example is where, instead of permitting full remote access, central banks allow banks to process payments remotely (either by a remote office of the bank or by a remote third party) but manage liquidity locally, so as to achieve some of the main benefits of remote access. In other cases, non-account holders might be able to make use of ancillary services (such as data processing or clearing) provided by the central bank and to transmit payment instructions directly to the central bank while settling those payments through their banks (as in CHAPS in the United Kingdom and the Federal Reserve's ACH system in the United States).[42]

As an illustration of the factors discussed here that are relevant to any review of access, Annex 2 considers the cases of five types of institution which are not currently allowed access to settlement accounts in all countries, but which could potentially seek access: securities firms, insurance companies, non-resident banks, non-financial corporations and specialist payment service providers.

4.1.2 Examples of policy reviews

The foregoing discussion has considered, fairly briefly, the sort of policy factors which central banks may consider in any review of access policy. On the face of it, none of the developments described in Section 2 fundamentally alter the balance between provision and prohibition reflected in central banks' existing access policies. Nor do any undermine the basic conclusion (albeit expressed in different ways between central banks) that access to central bank money should be restricted to cases where its special features (such as safety and neutrality) are particularly valuable in terms of social costs and benefits; or that there are valid risk and competition grounds for limiting access broadly as at present. And there are no unequivocal arguments in favour of substantially greater uniformity among central banks' policies in this area.

Nevertheless, certain central banks have in fact responded to the developments by reviewing, and in some cases changing, their policy on access and related facilities. The collective decision by CPSS central banks to allow CLS Bank, a bank incorporated under the US Edge Act, access to account facilities on a remote basis represents one such change, albeit one with very limited application. The central banks concluded that arguments against remote access were outweighed by the benefits of allowing CLS Bank, which handles very significant sums each day, to fund and defund in central bank money.

[42] "Settling" participants in CHAPS control their exposure to "non-settling" participants by setting limits on non-settling participants' payments.

In setting up the Eurosystem, a review of the access policies of the participating national central banks (NCBs) became necessary. The result was a set of common principles applying to all, and a set of individual decisions to be taken by each NCB. The common principles were the provision of accounts and credit to banks (ie credit institutions), the collateralisation of all credit, the predominant role for banks in intermediating credit[43] and the availability of credit only from the NCB of the country in which the financial institution is established. The individual decisions left for each NCB to make were whether to provide accounts to securities firms (ie investment firms) and/or clearing houses, whether to provide intraday credit to these institutions (so long as it was guaranteed by a bank) and whether to set more restrictive access criteria based on financial strength, the expected minimum number of transactions, payment of an entry fee, and legal, technical or operational aspects.

In the revision to its policy explained in Section 3, the Bank of England recently indicated its willingness to provide accounts to any direct participant in a payment system for which it agrees to act as settlement institution (although the Bank retains the discretion to deny access case by case where it feels it appropriate to limit its own risk or in pursuit of wider objectives). Credit would only be provided where the scale of the account holder's payment activities would make them significant direct participants in a systemically important payment system and where their direct membership would reduce risk for the financial system. The Bank's review was motivated by a range of factors, including the desire - reflected in the Core Principles - to implement transparent and objective access criteria, and the fact (mentioned above) that a number of non-bank payment service providers have applied for access to accounts in the context of the Bank of England's role as settlement institution for the LINK ATM network.

In Germany, the Bundesbank has in the past opened some accounts for businesses and individuals but only in cases where very active use of the account in terms of number and value of payments was expected. However, following a recent policy review, the Bundesbank has now decided that, for competition reasons, no new accounts will be opened for such customers and existing accounts will be closed by the end of 2003.

In Canada, following a review of policy by the Department of Finance and the Bank of Canada, the Canadian Payments Act (2001) opened membership of the Canadian Payments Association (CPA) to life insurance companies, securities dealers and money market mutual funds. As a result, the Bank of Canada is currently working with the CPA and the Department of Finance to review the CPA's eligibility conditions for direct participation in its retail clearing and settlement system, as well as examining its own policy on access to settlement accounts.

4.2 System design and central bank settlement services

For both historical and policy reasons, central banks have traditionally had an influential role in the design, development and operation of the large-value interbank payment systems settling in their currency. As noted earlier, central banks have an interest in ensuring that central bank money represents a viable alternative to commercial bank money and that potential holders are not discouraged by the associated costs from participating in the systems in which it is used. They therefore have a natural interest in promoting robust and efficient designs and in responding to users' needs as far as it is realistic to do so.

However, central banks face choices about the operation of interbank payment systems. It may be possible for a central bank to achieve its objectives in providing central bank money while minimising costs for its participants by utilising an existing settlement platform and/or outsourcing the operation and administration of its accounts to other central banks or other financial service providers. These decisions require careful analysis of the risk/efficiency trade-offs.

Where they operate their own systems, central banks are aware of the possible issue of competition with commercial banks in providing services. As noted in the executive summary, as well as helping to promote a competitive banking system, a choice of providers creates a healthy incentive for central banks to offer efficient services and provides market discipline.

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[43] As noted in Section 3.2.2, credit is also provided to certain non-banks but unlimited credit is only available if guaranteed by a bank. Thus the Eurosystem avoids disintermediation from a risk perspective, though not from an operational perspective.

4.2.1 Enhancing efficiency of service

Reducing liquidity costs at the domestic level

Section 2 noted that one consequence of recent improvements in interbank payment systems such as the widespread implementation of RTGS, DVP and PVP has been to raise the cost of direct participation in some respects, primarily because of the increased cost of more active liquidity management. Although there are, as yet, few indications that this is causing any significant switch from direct to non-participation, one consequence has been requests for central banks and system operators to introduce mechanisms to reduce such costs by allowing direct participants to economise on liquidity needs. In most countries, a wide range of participants voiced concerns about the costs associated with RTGS before its introduction. Similar concerns were expressed before the introduction of Model 1 DVP in securities settlement. And the introduction of CLS, with large, timed intraday payments, generated similar issues. Concerns related both to the added costs for direct payment system participants and their customers, and to the possibility for more regular, and more severe, shortages of liquidity to emerge with the potential to generate significant disruption in payment systems.

While such concerns have yet to materialise to any significant degree, these developments have already led the market to push for mechanisms such as hybrid systems and other liquidity saving devices. Technological advances and legal changes have facilitated the introduction of some of these liquidity saving features into certain systems without reintroducing the kind of uncertainties and risks which characterised the unprotected deferred net settlement systems which RTGS and protected DNS systems often replaced.

Examples of steps in this direction are the introduction of hybrid settlement mechanisms into the large-value systems in France (with PNS) and the United States (with the new arrangements in CHIPS). Also relevant is the introduction of liquidity saving features into the RTGS system in Germany (RTGS^{plus}). These mechanisms have in common "liquidity optimisation" features which combine the provision of intraday finality with "offset" mechanisms which reduce, potentially very significantly, the amount of liquidity required to finance payments. The CLS settlement process also includes features - such as the combination of gross real-time settlement with net funding of positions, as well as the continuous recycling of funds - that are designed to reduce the liquidity impact of reducing settlement risk in foreign exchange deals. BOJ-NET in Japan, CREST in the United Kingdom and Euroclear also have liquidity saving mechanisms that facilitate real-time DVP by allowing securities in the course of being purchased to be used as collateral for intraday credit or to be repoed to create the liquidity to fund the purchase. In its Model 1 DVP arrangements, Clearstream uses rapid batches with technical netting to reduce liquidity needs.

Liquidity optimisation mechanisms are not new per se; many RTGS and securities settlement systems include them as end-of-day or contingency measures, to be used if gridlock arises. The step change with the new optimisation mechanisms is that settlement via such mechanisms is continuous, not at discrete intervals. A number of other central banks, including the Bank of England, are at the early stages of discussion with direct participants over the arguments for and against introducing such features into local RTGS systems.

The introduction of such features changes both the quantity of settlement in central bank money and the role central bank money plays in the functioning of the payment system. While in systems such as RTGS^{plus} and PNS settlement takes place in central bank money, in the case of CLS and new CHIPS it occurs across internal accounts maintained by CLS Bank and CHIPS, but with funding and defunding of positions in central bank money. The value of central bank money used in settlement is not necessarily a good indicator of its importance, or of the soundness of the payment system. Nevertheless, the achievement of an appropriate balance of risk management and efficiency within such systems rests in part on the quality of the settlement asset used in various parts of the settlement process and provides an important reason for central banks to monitor closely the evolving design of interbank payment systems, and to influence and promote design changes where appropriate.

Reducing liquidity costs at the international level

The concerns touched on earlier in this report about the cost of liquidity have resulted in some major banks reviewing alternative means for managing payment liquidity in a global environment. One such effort was initiated by the Payments Risk Committee (PRC), a private sector group sponsored by the

Federal Reserve Bank of New York on which many of the largest global banks are represented. In a recent report, the PRC makes two broad recommendations.[44]

The first recommendation is for action by individual institutions to develop new, well constructed intraday liquidity services. The PRC advocates collateralising such services and eliminating obstacles to moving collateral across borders in support of the services. The report identifies a variety of possible arrangements for consideration, such as intraday real-time repos, cross-border collateral pool facilities and intraday currency and collateral swaps. The PRC also indicates that it plans to work with private sector entities interested in developing such market-based liquidity services.

The second recommendation is for action by central banks to broaden the range of foreign currency denominated and foreign-located securities they will accept as collateral when providing intraday liquidity. In the near term, the PRC recommends that each G10 central bank consider accepting a range of high-grade sovereign debt from the G10 countries as part of its collateralised intraday liquidity facilities. In order to receive and manage such collateral, the report recommends that each central bank consider establishing an account at, and using the services of, ICSDs or national CSDs/custodians with account links to ICSDs.[45] The PRC also recommends that, over time, each central bank determine whether further expansion of the range of eligible foreign securities as collateral is warranted.

Enhancing business efficiency

The developments highlighted in Section 2 may also encourage central banks and other payment system operators to consider how to enhance efficiency in payment systems in other ways, for example by introducing technical changes and longer operating hours.

Incremental but nevertheless important changes have been made in areas such as network infrastructure and message protocols. For example, in 2001 the CHAPS Sterling system in the United Kingdom and the RTGS^{plus} system in Germany each moved from a proprietary network to SWIFT, both to reduce costs for direct participants and to remove technological constraints in expanding direct participation. The Bank of Japan plans to make adjustments to BOJ-NET so that it will accept message formats based on SWIFT and other international standards, and is examining the feasibility of replacing dedicated terminals with PCs. The Monetary Authority of Singapore has also embarked on a project (MEPS+) to upgrade the functionality of its RTGS system to improve system connectivity and increase efficiency.

Longer system operating hours may in some circumstances be important. SIC, the Swiss RTGS system, has since its inception in 1987 been open virtually 24 hours a day to take advantage of the relatively low marginal cost of using the overnight period primarily to process retail payments. Longer hours may also contribute to strengthened interbank settlement for cross-border markets by allowing for overlap between different RTGS systems. This was one rationale for the Federal Reserve's 1994 policy to extend Fedwire operating hours into the early morning hours, which was implemented in 1997. The Federal Reserve also hoped the resulting overlap would contribute to a reduction in foreign exchange settlement risk through innovations in payment and settlement practices. CLS is the obvious example of such an innovation. Other central bank-run systems also supported the implementation of CLS by extending hours of operation. For example, LVTS in Canada brought forward its opening hours into the early morning, while BOJ-NET in Japan and RITS in Australia extended the closing times of their systems. The Federal Reserve has recently decided to bring forward Fedwire's opening time even further, to 21:00 EST, to further facilitate global settlements of US dollar transactions.

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[44] *Managing payment liquidity in global markets: risk issues and solutions*, Payments Risk Committee, March 2003.

[45] In the United States, the Federal Reserve permits eligible depository institutions to pledge certain non-US sovereign debt and Brady bonds through its accounts at Euroclear and Clearstream. In the European Union, an arrangement called the Correspondent Central Banking Model exists between EU central banks to enable eligible collateral held in one EU member state to be used to obtain euro credit obtained in another, the main purpose being to promote the integration of euro area money markets. Another arrangement was recently introduced in Scandinavia where the central banks have agreed to allow cash held with one central bank to be eligible as collateral for credit from another.

4.2.2 Expanding areas of service

Use of central bank money in ICSDs

The consolidation of a significant proportion of European securities settlement within the Euroclear group raises a range of issues relevant to the use of central bank money in payment systems.[46]

The CSDs that as a result of the consolidation form part of the Euroclear group currently settle in central bank money, while the ICSD participants basically settle in commercial bank money.[47] When the consolidation is complete, the Euroclear group plans to migrate all settlement to a single technical platform, which Euroclear Bank will operate. Euroclear Bank participants will be able to settle in both central and commercial bank money through a single entry point. The plan is also to improve the fungibility between balances held in central bank accounts and balances held in Euroclear accounts.

An issue under consideration is therefore how the Euroclear group will develop its central bank money services by linking its settlement module to the relevant central banks in order to make them a convenient alternative for Euroclear users. One option, in effect implemented already by the French CSD and the Bank of France, is for participants to hold a sub-account at the central bank, the operation of which is, in effect, outsourced to the CSD. This raises questions over how to manage the risks associated with outsourcing the operation of a portion of central bank accounts to a third party. Such questions are not new to central banks, which have in the past sought to manage those risks in a variety of ways.

Settlement by ICSDs in central bank money also raises other practical and policy issues. For example, as noted in Box 1 earlier, in certain cases there needs to be sufficient overlap in operating hours between the ICSD and the relevant central bank payment systems, which may require extensions to operating hours for those systems, as just discussed. Moreover, ICSDs provide multicurrency facilities (eg providing credit in a foreign currency, accepting collateral denominated in a foreign currency) which central banks may not be ready to provide. Finally, if ICSDs use central bank money, given the international character of their participants the question of remote access to central bank money could arise.

Central bank multicurrency settlement services

Some developments may also prompt central banks to consider the services which they, individually and perhaps also collectively, offer account holders. Section 1 noted that cross-border payments generally involve the use of a correspondent to settle payments in the domestic payment system on behalf of the non-resident customer bank. And Section 2 noted that increases in cross-border flows may result in non-resident banks accounting for a larger share - and certainly larger absolute amounts - of total payments in each currency.

Allowing remote access by those institutions (primarily banks) most active in cross-border flows would give them the option of settling directly in central bank money rather than using a correspondent bank. As noted earlier in this section, however, it is not clear how much demand there is for widespread remote access.

In principle, another option could be for central banks themselves to offer multicurrency settlement facilities, using the accounts most already hold with one another. This would provide locally resident institutions with the option of using their local central bank account to settle payments and hold proceeds rather than using a correspondent. Provision of multicurrency facilities would raise significant policy issues, not least concerning any possible provision of credit. In practice, central banks in most cases provide services only in their domestic currency.

In providing either remote access or multicurrency facilities, central banks would to a certain extent be competing with correspondent banks. In providing remote access, they would be competing with primarily resident correspondent banks providing services in the domestic currency. In providing multicurrency services, they would be acting as global correspondents. The extent to which they would

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[46] Ownership consolidation has already taken place. Technical and operational consolidation is in progress.

[47] As explained in Box 3 earlier, for euro-denominated securities the option to use central bank money exists in theory but is effectively not used in practice.

want to take such a path (individually or collectively) would shift the present public policy considerations on the desired balance of competition between the public and private sector.

4.3 Oversight, supervision and regulation

Implications of a concentration of payment activities

While the Ferguson Report found evidence of consolidation among the major financial intermediaries, evidence of significant impact on the degree of concentration or tiering in the payment system is limited and often anecdotal. However, there are nevertheless significant concentrations of payment activities and associated risks in some markets.

The implications of concentrations of activity were addressed by the Ferguson Report (albeit specifically in the context of consolidation), which analysed their impact on the financial markets generally, including payment and settlement systems. In relation to the latter, the report drew out clearly the risk- and efficiency-related benefits of a concentration of activities, for example because of large players' ability to invest in technology and to benefit from economies of scale and scope, and to provide their customers with broader services and with a wider a pool of expertise, or from potential improvements in credit and liquidity risk controls. More generally, the existence of specialist payment intermediaries - correspondent banks - helps ensure that financial market participants and their customers have ready access to the payment services which are essential to their own operations and to the smooth functioning of the financial markets, which in many cases helps to mitigate risk.

But the Ferguson Report also spelled out the risks associated with such concentrations, including the concentration of payment- and settlement-related exposures on large correspondent banks and custodians, the high reliance on those firms to provide an effective payment service, the exposures those firms in turn incur on their customers that could become a source of their default, and the impact on the functioning of the market should any of those risks materialise, given the pivotal role these firms play.

Relevant considerations

As described in Section 3.3, central banks do not in general specify which institutions must maintain and use settlement accounts at the central bank. This reflects the view that policy objectives can be achieved without taking this additional step, primarily because most significant financial institutions will choose to become direct participants in the interbank payment system and hold accounts at the central bank. Nevertheless, imposing stricter requirements on the use of central bank money by particular institutions or classes of institution remains an option.

However, perhaps more relevant policy questions may lie in the implications of the concentration of payment flows in a small number of commercial institutions for central banks' provision of settlement services and for central banks' oversight of payment systems.[48] The implications for the provision of settlement services were analysed in Section 4.2; the implications for oversight are analysed hereafter.

Oversight, and the application of formal standards which that oversight requires, tends to be limited to the core interbank payment systems. The rationale here is essentially that it is primarily in these core systems that the sorts of exposures exist which could give rise to systemic risk. But a feature of highly concentrated systems is that institutions exist - large correspondent banks - that have many of the features of core payment systems. They provide payment services to a wide range of customers, many of which settle across the books of the correspondent. The values settling across those books are, in some cases, extremely large. And customers may, in practice, have little choice in the short term over which correspondent to use.

[48] Some central banks (eg Sveriges Riksbank, the Bank of England and the National Bank of Belgium) are also considering how to integrate assessment of the systemic risks posed by concentrations of activity within the payment system and elsewhere into their broader macroprudential surveillance of the health of the financial sector.

On the face of it, there is a case for considering these banks to be a form of large-value "payment system" and for treating them in a compatible (but not necessarily identical) way, for example developing certain supervisory tools for use in influencing the quality of risk management and applying more formal payment-related "standards" to such institutions. The Ferguson Report noted that:

> "because of consolidation, central bank oversight of payment systems is becoming more closely linked with traditional bank safety and soundness supervision at the individual firm level. Increasing cooperation and communication between banking supervisors and payment system overseers may be necessary both domestically and cross-border."

It added that:

> "central banks and bank supervisors should carefully monitor the impact of consolidation on the payment and settlement business, and should define safety standards where appropriate. In particular, central banks, in conjunction with bank supervisors, may need to consider various approaches, possibly including standards, that could be used to limit potential liquidity, credit and operational risks stemming from concentrated payment flows through a few very large players participating in payment systems."

Points for further analysis

However, defining such standards would be highly complex. The term "quasi-system" has been coined to describe these institutions. But this simple term masks a host of unresolved areas of debate.

At a high level, a quasi-system might be defined as:

> "A commercial institution responsible for clearing and settling payments on behalf of customers which represent, by value, a substantial percentage of payments in a particular currency, a significant proportion of which are internalised by being settled across the books of the institution rather than through an organised payment system."

But such a definition is deceptively - perhaps even misleadingly - simple. There are differences between interbank payment systems and commercial banks. Standards appropriate for payment systems (such as the Core Principles or the SSS recommendations) may not be appropriate for commercial entities without significant modification. To the extent that they are applicable, payment system standards may already be applied by the prudential supervisors of these firms.

So policy assessments of how to identify and perhaps deal with "quasi-systems" need to consider a wide range of factors. Some of these factors are as follows:

- *The nature of the institutions*. Careful consideration is needed of the possible reasons for concern about quasi-systems. These might include the high exposures implied for the institutions or their customers and the potential systemic impact of those exposures materialising; the absence of alternatives to whom customers could incur exposure; the degree of reliance on a small number of institutions, and the impact of any credit, liquidity or operational problems in one of the institutions on the economy overall; or a concern to treat functionally similar institutions consistently.
- *The criteria for defining a "quasi-system"*. Possibilities include the values (or volumes) processed by an institution, its market share, the average size of payments processed/settled, the extent to which settlement of customer payments is internalised, the degree to which an institution employs consistent rules and procedures that are similar to those of interbank payment systems, the number or type of customers (eg whether banks or non-banks), the number of competitors and the financial resources of the institution. In addition, whatever criteria are chosen, it seems unlikely that there is any clear dividing line between banks that are quasi-systems and those that are not.
- *The sort of "standards" that might address any concerns*. As well as the more familiar (for financial institutions) areas of governance, risk management and operational reliability, the standards applied to interbank payment systems deal with, among other things, legal soundness, transparency, default rules and efficiency. It is not clear to what extent such standards are meaningful for commercial banks. Where standards are judged to be meaningful, it must be determined whether or not they are already applied by, for example, banking supervisors in a way that would address any concerns about quasi-systems.

Moreover, any standards may need to take account of the unclear dividing line between quasi-systems and other banks.

- *Regulatory powers*. Central banks typically rely on a variety of powers, including non-statutory powers, to carry out payment system oversight, and these powers may not be sufficient to conduct oversight of quasi-systems, however identified. And overseers will need to consider how closely they could or should work with banking supervisors in considering these issues and in implementing any subsequent policy changes.

This list of factors is no doubt incomplete but it illustrates the complexity of the issues. It is not yet clear what, if any, policy initiatives will result from central banks' consideration of this topic but it is clear that were any additional regulatory standards to be proposed, they would need to have a sound basis and it would be vital to consider very carefully any possible impact on market participants and market structure. Correspondent banking is a key aspect of the payment system and the financial markets it serves. Central banks are rightly wary of undertaking any initiative that unwittingly changes the balance of costs and risks so as to discourage activity in this important area.

5. Concluding remarks

Ten propositions

The CPSS central banks share considerable common ground in their objectives as well as in their main tenets of policy concerning the use of central bank money. Such common ground can be summarised in the following propositions:

A. General principles

1. *Market principle*: private economic agents are generally free to decide the means of payment used for settling their transactions. The multiplicity of issuers of money provides the advantages of competition in fostering innovative and efficient payment practices.

2. *Public interest*: a public interest exists, mainly entrusted to central banks, in providing the economy with sound, efficient and stable payment systems. There is a consequent public interest for central bank money, including banknotes and deposit money, to play a pivotal role in an economy and its payment system. This pivotal role of central banks and central bank money is one of the pillars that preserves the payment architecture as described hereafter.

3. *Payment architecture*: the payment architecture is framed by the interaction between public authorities (in particular the central bank) and private agents (in particular commercial banks). Central banks and commercial banks try to keep this architecture flexible enough to avoid deterring innovation.

B. Architecture

4. *Composite use of central and commercial bank money*: contemporary monetary systems are based on the mutually reinforcing role of central and commercial bank money. To foster safety and efficiency in the financial system, central banks pursue policies to maintain the convertibility of commercial bank monies into central bank money at par (and vice versa). The singleness of the currency is thereby maintained and the public can use its different forms interchangeably when making payments.

5. *Commercial bank money*: commercial banks are the primary suppliers of money as well as of payment services to the general public in developed economies. They also provide specialised payment services to other banks, mainly via correspondent banking. The joint supply of deposits and loans gives commercial banks the unique function of providing the liquidity needed to make payments. The licensing and regulation of commercial banks

promotes their solvency and liquidity, helping to preserve confidence in the currency. Commercial banks use liquidity from the central bank to facilitate their payment activity.

6. *Central bank money*: to foster the safe and efficient operation of payment and settlement systems, central banks provide accounts and deposit money to banks and, in certain cases, to other organisations. Central bank money is a highly liquid settlement asset with negligible credit risk for these systems. Central banks also provide banknotes to the general public in order to provide a financially secure means of transacting and discharging debts.

7. *Intraday credit*: the usefulness of central bank money as a settlement asset in payment systems, particularly in RTGS systems, depends in part on the central bank's ability and willingness to extend intraday credit. Access to an account may be of less value if not accompanied by access to the central bank's intraday credit. While all CPSS central banks provide intraday credit to banks in some form, only some grant intraday credit to other account holders.

8. *Tiering and concentration*: the architecture of payment systems is normally tiered and payments often concentrate in intermediate tiers. If central banks consider the concentration of risk too high in a payment system, they may need to consider additional measures to contain systemic risk, such as broader access, enhanced services, or expanded supervision or oversight.

9. *Systemic risk*: systemic risk is inherent to large-value payment systems. In recent years, it has been reduced within and across CPSS countries. The widespread adoption of RTGS systems settling in central bank money has enhanced the safety of the payment system within countries. Similarly, the development of CLS Bank, which uses central bank money for funding and defunding, addresses the major risk in the settlement of foreign exchange transactions across countries.

10. *Multicurrency systems, single currency central banks*: in multicurrency systems, the traditional use of central bank money as the settlement asset may be impractical, because the supply of central bank money and central bank services is normally confined within the area of jurisdiction of the central bank. In line with the existing understanding in the G10, central banks in most cases provide services only in their domestic currency. Consequently, multicurrency systems normally settle in commercial bank money, although every central bank may retain a role as the gateway to these systems for its own currency.

Current challenges and the tools to respond to them

There are various developments that may prompt central banks to review their policies towards the use of central bank money. One development is the possibility of greater concentrations of payment activities and associated exposures within individual banks - concentrations which may arise for various reasons, such as consolidation between the banks themselves, greater specialisation by certain banks in areas such as correspondent banking that have grown relatively rapidly, or changes in cost structures that have encouraged indirect rather than direct participation. This development is clearly of interest to central banks because of the possible implications for the level and distribution of risk in the payment system.

Two other developments, while also having risk implications, are perhaps more relevant to central banks' efficiency and fairness objectives. One concerns the requests from some payment system users for new or improved services that change the way in which central bank money is used - services such as longer operating hours, interoperability between systems, liquidity cost-saving mechanisms or even multicurrency functionality. The other is the apparent desire on the part of some non-bank financial institutions that are active in payments, or even of certain non-financial institutions, for central bank settlement accounts and direct access to payment systems.

While it would be misleading to suggest there is any strong or universal trend, nevertheless it is the case that some central banks are already facing these developments while others may face them in the near future. Sometimes, having reviewed the situation, central banks may decide that no policy change is needed. But where they decide that the developments do warrant a response, all central banks have broadly similar tools at their disposal. Most directly, if desirable they can modify their access policy to allow new types of institutions as account holders. They can also alter the sorts of services that are available to account holders (eg whether credit is provided) or the design of the

interbank payment systems they operate (eg changing the technical means of access). And more broadly, they can use their oversight responsibilities, where appropriate in conjunction with banking supervisors, to determine the standards applicable to payment systems and perhaps also to commercial providers of payment services.

Central bank policies

While the developments they face may often be similar, and while sharing a broadly common set of policy tools, there are variations among central banks in their approach to achieving their policy aims.

As noted in the executive summary, there are a number of relevant issues for central banks concerning the use of central bank money in payment and settlement systems. These include: when such systems should be required to settle in central bank money; when an alternative (high-quality) settlement asset might be acceptable; when the use of central bank money can be limited to the funding and defunding process; what circumstances render the use of central bank money impractical; and what risk management measures constitute a close proxy to central bank money.

Recent reviews of access criteria for individual institutions have also highlighted a diversity of approaches - primarily in relation to whether access to settlement accounts should be limited to core payment service providers, and in particular to banks; or alternatively how far access, and credit, should be extended to other financial and even non-financial institutions. While (as noted in Section 3) there is broad agreement on the "core" set of account holders, there are variations of policy on which classes of institution beyond the core should be entitled to maintain central bank accounts. Behind these variations lie differences in, for example, the extent of the trade-off between efficiency and safety in opening up access to accounts, and in the implications for the financial system and for the central bank of permitting broader or narrower access to accounts and to intraday credit.

Other reviews have focused on (or are beginning to do so) the optimal design of payment systems, including from a liquidity management perspective, and on the role of "oversight" in monitoring and assessing risk in the payment system as a whole, including in relation to risks arising in lower tiers (the "quasi-system" issue).

One particular variation to note here is the extent to which central banks are prepared to provide settlement services in parallel to commercial firms (mainly banks) and the degree to which they are ready and able to establish norms delimiting the respective roles of central and commercial bank money. Every central bank develops its own combination of operational involvement and normative involvement, although it is true that different traditions make them lean towards one approach or another.

It is understandable that there will be variations in central banks' responses to developments. Given the variety in countries' circumstances, different policies may be necessary even in order to achieve common objectives. Moreover, any variations need to be seen in the context of the broad similarities among the overall policies of central banks towards the use of central bank money. While the possible variations in responses to the developments are not trivial, they do not change this broad commonality of view. Most fundamentally, all CPSS central banks believe that it is essential to preserve a mix of central and commercial bank money, and that belief remains unchanged by the developments discussed here.

To the extent that the majority of the issues considered in this report concern the use of each central bank's own currency, it is inherent that central banks have a substantial degree of autonomy in making their own policy choices. Nevertheless, particularly when issues arise which have an international dimension, central banks may deem a collective response to be appropriate. Central banks are well used to such collective decisions, which need not necessarily imply general harmonisation of policies.

Looking forward

Central banks are likely to continue to review their policies from time to time and this report is intended to provide a framework for any such reviews. It is clear that central banks need to remain responsive to further changes in the environment in which the important policy instrument of central bank money is utilised. There is an increasing variety and sophistication of global payment processes and systems. These developments have not rendered central bank money obsolete, nor are they likely to do so. This is partly because central banks have responded to change proactively, in their payment system policy or by influencing design changes in payment systems. Such flexibility needs to be maintained to respond to new challenges.

Annexes

Annex 1
Central bank policies

This annex provides, for each CPSS central bank, information on the following topics.

1.1 Policy on interbank payment systems: content of policy

Which systems currently do not settle in central bank money? Are any systems (either existing systems or in theory) discouraged from settling in central bank money or not allowed to do so? Which systems are required, expected or encouraged to settle in central bank money?

For systems that do settle in central bank money, how is consistency with the policy on institutional access (described in 2 below) achieved (eg in deciding whether an institution can be a direct participant, does the system have to conform to central bank rules on account access)?

1.2 Policy on interbank payment systems: implementation of policy

Is the policy explicit? How is the policy implemented?

2.1 Policy on institutions: content of policy ("required to have an account")

Do banks (and any other institutions) have to hold an account/hold funds at the central bank for reserve or liquidity requirements or similar purposes? If so, can the funds be used for payment purposes (either directly or in some other way - eg as collateral for credit)?

Do institutions that choose to be the central bank's counterparties for monetary policy operations need to have an account? If so, are any institutions obliged to be counterparties (and thus obliged to hold an account for this reason)?

Is there any requirement (implicit or explicit) that certain institutions be direct participants in certain systems that settle in central bank money (eg a requirement that large banks be direct participants in the RTGS system)?

Are there any other reasons why certain financial institutions have to hold an account at the central bank?

2.2 Policy on institutions: content of policy ("allowed to have an account")

What types of institutions and individuals are allowed to have accounts?

2.3 Policy on institutions: implementation of policy

Are the policies in 2.1 and 2.2 transparent (eg set out explicitly in regulations, policy statements, speeches, etc)? How are the policies implemented?

3.0 Policy on types of payments

Is there any policy on how certain types of payments should be made which may affect whether these payments settle in central bank money and, if so, what is its relevance for the use of central bank money?[49]

[49] For example, a central bank may have a policy that all large-value payments should be made using an RTGS system that settles in central bank money, the purpose of the policy being to ensure that such payments are not processed by systems that lack the necessary safety features. However, typically such a policy is not intended to prevent non-participation. That is

National Bank of Belgium

(For the full text of the questions to which this information applies, see the introduction to this annex.)

1.1 Policy on interbank payment systems: content of policy

Settlement in central and commercial bank money

The NBB would in general be willing to settle for any system (subject to the condition set out below).

The RTGS system (ELLIPS) is required to settle in central bank money in accordance with Core Principle VI for systemically important payment systems. Other systems such as NBB SSS, CEC, Euronext Brussels/CIK and Clearing House of Belgium settle in central bank money for historical and/or practical reasons.

Euroclear (for most of its operations) and credit card arrangements (American Express, Diners Club and cross-border operations of Visa/MasterCard) do not settle in central bank money. In the case of Euroclear the option to settle in central bank money exists and Euroclear plans to improve its central bank money settlement services in the framework of its consolidation process with local CSDs. Moreover, a risk/efficiency analysis led to the conclusion that settlement in central bank money should not be required. The credit card arrangements concern limited amounts and are not systemically relevant/important.

Coordination between policy on systems and policy on institutions

For systems settling in central bank money, as regards the decision on whether an institution can be a direct participant, the system has to conform with central bank rules on account access.

1.2 Policy on interbank payment systems: implementation of policy

The policy, which is explicitly set out, is implemented by the NBB through its operation and/or oversight of payment systems.

2.1 Policy on institutions: content of policy ("required to have an account")

According to ESCB statutes and guidelines, banks have to hold monetary reserves at the end of the day. Those funds are released at the beginning of the next banking day. They are not currently used for payments.

Credit institutions eligible for monetary policy operations are not obliged to be counterparties. Nor is there any requirement that certain institutions be direct participants in any system. Should a major Belgian bank apply for indirect participation in an important domestic interbank payment system, the NBB would evaluate the situation.

2.2 Policy on institutions: content of policy ("allowed to have an account")

The NBB has no formal policy concerning the opening of accounts in its books. The NBB has the right to refuse to open an account and will justify this refusal if requested.

In practice, the following institutions can open accounts:

- credit institutions and securities firms for use as direct participants in the payment or clearing system; foreign institutions can also open accounts for this reason;

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to say, a bank wanting to make a large-value payment may do so by submitting it to its correspondent (which then enters it into the RTGS system); the bank does not itself have to become a direct participant. Thus, even with such a policy, settlement of large-value payments may involve commercial bank as well as central bank money.

- clearing houses and central counterparties;
- certain government agencies and accountants (to meet legal requirements);
- IFIs and other central banks can have accounts as ordinary customers.

Most institutions that could have an account at the NBB do have such an account.

2.3 Policy on institutions: implementation of policy

Not applicable since the policy is expressed in terms of allowing/refusing accounts rather than encouraging or requiring them.

3.0 Policy on types of payments

No policy (except general ESCB policy).

Bank of Canada

(For the full text of the questions to which this information applies, see the introduction to this annex.)

1.1 Policy on interbank payment systems: content of policy

Settlement in central and commercial bank money

LVTS, ACSS and CDS debt clearing are required to settle in central bank money for reasons described below (see 1.2). LVTS and ACSS settle on Bank of Canada accounts. CDS settles payment obligations over LVTS.

The CDS equities settlement system, the Canadian Derivatives Clearing Corporation settlement system and credit card systems do not settle in central bank money.

The Bank's preference is to accommodate industry-led initiatives for interbank systems to settle using central bank money if they are consistent with payment policy objectives. As an industry-led initiative, the CDS equities settlement system will be incorporated into the CDSX system that uses central bank money as its settlement asset later this year.

Coordination between policy on systems and policy on institutions

Institutions that are required to settle in central bank money as a result of their participation in a system such as LVTS are permitted to open accounts at the Bank of Canada.

1.2 Policy on interbank payment systems: implementation of policy

The policy on LVTS and ACSS is set out in the relevant by-law of the Canadian Payments Association (CPA). For CDS the requirement to settle in central bank money comes from the guidance provided by the Bank of Canada in the course of the oversight process. (Designation as being of systemic significance under the 1996 Payment, Clearing and Settlement Act does not explicitly require settlement in central bank money.)

2.1 Policy on institutions: content of policy ("required to have an account")

No institutions are required to have accounts. Banks do not face reserve or liquidity requirements. All direct participants in LVTS become counterparties for certain types of monetary policy operations. Securities dealers may be counterparties but the settlements involve LVTS transfers to or from their bankers; they do not currently have settlement accounts at the central bank.

2.2 Policy on institutions: content of policy ("allowed to have an account")

At present, banks, credit cooperatives and securities dealers are allowed accounts if they are direct participants in the ACSS. All financial institutions that are eligible to be CPA members, which include life insurance companies and money market mutual funds, are also eligible to participate directly in the LVTS and obtain settlement accounts, as are central counterparties that serve designated systems such as CDS and CLS. The expansion of the institutions eligible for membership in the CPA could in future lead to wider direct participation in the ACSS by securities firms. Discussions are currently under way concerning the criteria that would be applicable in these cases, including the legal ability to pledge collateral, and the role of the relevant regulatory body in providing a solvency assessment. The discussions involve the central bank, the Ministry of Finance and the CPA.

The federal government, certain other government entities, other central banks and international financial institutions are allowed accounts as customers of the Bank of Canada (ie not as participants in the systems mentioned above).

2.3 Policy on institutions: implementation of policy

The relevant CPA by-laws are available on the CPA website. Proposed changes are published for public comment for 60 days. The requirements for systems such as those of the CDS are worked out case by case.

The policy has been implemented in a manner that reflects the provisions of the legislation in the case of the LVTS and ACSS, and the decisions to designate certain other structures pursuant to the 1996 Act.

3.0 Policy on types of payments

Policies reflect the structures through which payments are moving, rather than particular types of payments.

Eurosystem (general)

(For the full text of the questions to which this information applies, see the introduction to this annex.)

1.1 Policy on interbank payment systems: content of policy

Settlement in central and commercial bank money

RTGS and large-value net systems are required to settle in central bank money (see *Minimum common features for domestic payment systems*, November 1993 - available on the website of the ECB, www.ecb.int). For additional information, see individual national central bank (NCB) replies.

Coordination between policy on systems and policy on institutions

For TARGET, rules on direct participation and account access are synonymous (since TARGET is owned and operated by central banks). For EURO1, all its participants have access to TARGET. For other systems, see individual NCB replies.

1.2 Policy on interbank payment systems: implementation of policy

It is general practice in the Eurosystem that payment systems settle in central bank money. The Eurosystem discloses its policy through several documents and policy statements (eg *Minimum common features for domestic payment systems*).

2.1 Policy on institutions: content of policy ("required to have an account")

Credit institutions are required to hold minimum reserves. For this purpose they can either have their own account with an NCB or maintain their reserves through an intermediary. Minimum reserves can be used directly for payment purposes during the day. Minimum reserves are remunerated at the ECB's rate for the main refinancing operations.

See individual NCB replies as regards the obligation of a monetary policy counterparty to open an account at the central bank. In practice, almost all monetary policy counterparties do open an own account at the national central bank. However, no credit institution is obliged to be a counterparty for monetary policy operations.

There is no requirement that certain institutions should be direct participants in certain systems that settle in central bank money, but if one of the largest banks were not to be a direct participant in TARGET this would raise some questions.

2.2 Policy on institutions: content of policy ("allowed to have an account")

Access to accounts

NCBs can determine their own rules, except that insofar as TARGET is concerned they are bound by common rules (TARGET Guideline) which say that:

(a) supervised credit institutions must be allowed to be direct participants in TARGET and given an account;

(b) as an exception, certain government/public sector bodies, investment firms (as defined by EU legislation) and clearing houses may (at the discretion of individual NCBs) be allowed to be direct participants in TARGET and given an account.

In both cases this is subject to:

(c) the institution being established in the EEA;

(d) other criteria which individual NCBs can set, if they choose to, concerning financial strength, expected minimum number of transactions, payment of an entry fee, and legal, technical and operational aspects.

Apart from TARGET, NCBs can set their own criteria for account access but cannot provide credit in euros unless the entities concerned fall under the TARGET Guideline.

Access to intraday credit

NCBs provide intraday credit to supervised credit institutions if they are eligible counterparties for Eurosystem monetary policy operations and have access to the marginal lending facility.

Provided that it is a clear condition that intraday credit shall remain limited to the day in question and that no extension to overnight credit is possible, intraday credit may also be granted to:

(a) treasury departments/public sector bodies;

(b) investment firms, on condition that they submit satisfactory written evidence that they have concluded a formal agreement with a Eurosystem monetary policy counterparty to cover any residual debit position at the end of the day in question; otherwise access to intraday credit is limited to investment firms which hold an account with a central securities depository, and the investment firm in question is subject to a liquidity deadline or the amount of intraday credit is subject to a ceiling;

(c) supervised credit institutions which are not eligible counterparties for Eurosystem monetary policy operations and/or do not have access to the marginal lending facility;

(d) clearing houses, on condition that the arrangements for granting intraday credit to such organisations are submitted in advance to the Governing Council of the ECB for approval.

Intraday credit must be based on adequate collateral. It is provided free of interest.

Intraday credit shall not be granted to any remote participant.

2.3 Policy on institutions: implementation of policy

The policy is set out in the TARGET Guideline, which is a public document.

Since the policy is expressed in terms of allowing accounts rather than encouraging or requiring them, the question of how policy is implemented is not applicable.

3.0 Policy on types of payments

Large-value payments are encouraged to use RTGS settling in central bank money (see *Minimum common features for domestic payment systems*). The Eurosystem does not influence the choice between direct participation and non-participation.

Bank of France

(For the full text of the questions to which this information applies, see the introduction to this annex.)

1.1 Policy on interbank payment systems: content of policy

Settlement in central and commercial bank money

All interbank systems currently settle in central bank money except international debit/credit card arrangements for cross-border transactions (eg MasterCard).

Indeed, large-value interbank systems in euros have to settle in central bank money pursuant to the report on *Minimum common features for domestic payment systems* adopted at the European level; other systems are encouraged to do so. No systems are discouraged from settling in central bank money or not allowed to do so.

Coordination between policy on systems and policy on institutions

In general, systems settling in central bank money have to conform to central bank rules on account access.

The compliance of TBF with the access policy described below is fully implemented within the Bank of France. The Bank of France is also consulted each time a credit institution applies to connect to the PNS system (and in certain cases to the RGV securities settlement system) since cash positions in central bank money are embedded in these systems.

Other systems apply their own rules regarding access policy within the framework provided by Directive 98/26/EC on settlement finality in payment and securities settlement systems. This directive contains provisions regarding the type of institutions that can become participants in payment and securities settlement systems, ie basically credit institutions and investment firms. The Bank of France may control access rules applied by the system in order to monitor that it continues to comply with the above-mentioned directive. The Bank of France may also apply such controls pursuant to its oversight function, especially if the system is systemically important and must therefore comply with the Core Principles as regards its access policy.

The mechanism of end-of-day settlement in central bank money of a system does not mean that its participants need to have direct access to central bank money: direct participants in such systems can settle their end-of-day positions through an intermediary which is a direct participant in the RTGS system.

1.2 Policy on interbank payment systems: implementation of policy

The policy is set out explicitly and is in conformity with jointly agreed EU policies, including the TARGET Guideline. The policy is implemented through specific agreements and moral suasion.

2.1 Policy on institutions: content of policy ("required to have an account")

Within the countries of the euro area, credit institutions are required to hold minimum reserves at the central bank. For this purpose they can either have their own account with the Bank of France or maintain their reserves through an intermediary. Minimum reserves can be used directly for payment purposes during the day.

Institutions that choose to be the central bank's counterparties for monetary policy operations need to have an account. But no institution is obliged to be a counterparty.

There is no other requirement as such to hold an account at the central bank. But some institutions may prefer to have their own account, to benefit from direct access to the system or to make banknote and coin withdrawals and deposits directly, instead of having to go through an intermediary.

2.2 Policy on institutions: content of policy ("allowed to have an account")

RTGS accounts

The following institutions are authorised to have an RTGS account:

- credit institutions as defined by Article L. 511-1 of the Monetary and Financial Code (formerly Article 1 of Act 84-46 of 24 January 1984);
- investment firms authorised to provide the services listed in Points 2, 3, 5 or 6 of Article L. 321-1 of the Monetary and Financial Code (formerly paragraphs b, c, e and f of Article 4 of Act 96-597 of 2 July 1996) and authorised as an Account Keeper-Custodian under the terms of Articles 6.2.2 ff of the Conseil des Marchés Financiers General Regulations;
- credit institutions having their head office in a country that is a party to the Agreement on the European Economic Area and acting under the terms of Article L. 511-23 of the Monetary and Financial Code (formerly Article 71-2 of Act 84-46);
- investment firms having their head office in a country that is a party to the Agreement on the European Economic Area that are authorised to provide the investment services mentioned in paragraphs 1 (b), 2 or 4 of Section A of the Annex to Directive 93/22/CEE of 10 May 1993 and acting under the terms of Article L. 532-18 of the Monetary and Financial Code (formerly Article 74 of Act 96-597 of 2 July 1996);
- foreign credit institutions and investment firms authorised in France or another country in the European Economic Area having their registered office in a country that is not a party to the Agreement on the European Economic Area;
- securities settlement systems;
- the Caisse des Dépôts et Consignations;
- public sector institutions entitled to manage accounts for their customers.

The opening of an RTGS account is also subject to other criteria such as technical ability and the provision of a satisfactory legal opinion for foreign participants (branches and remote access).

Other accounts

"Ordinary" accounts can be opened with the Bank of France by any of the following institutions:

- credit institutions as defined by Article L. 511-1 of the Monetary and Financial Code (formerly Article 1 of Act 84-46 of 24 January 1984);
- investment firms authorised to provide the services listed in Points 2, 3, 5 or 6 of Article L. 321-1 of the Monetary and Financial Code (formerly paragraphs b, c, e and f of Article 4 of Act 96-597 of 2 July 1996) and authorised as an Account Keeper-Custodian under the terms of Articles 6.2.2 ff of the Conseil des Marchés Financiers General Regulations;
- credit institutions or investment firms authorised in France, Andorra or Switzerland and having their head office in a country that is not a party to the Agreement on the European Economic Area;
- cash carriers making banknote and coin withdrawals/deposits on behalf of credit institutions;
- "state" institutions.

Such ordinary accounts do not involve participation in an interbank payment system because they are mainly used for withdrawals and deposits of banknotes and coins with the central bank. However, credit institutions can choose to include the balance maintained on such accounts in the scope of the reserve requirements.

Various other institutions (see Table A1 in Annex 3) can be customers of the central bank. Additionally, although as a general rule individuals and non-financial firms have not been allowed since 1994 to open an account at the Bank of France, the Monetary and Financial Code states that the General Council can authorise a legal entity or individual to open such an account.

Other information

A large majority of banks, but a minority of non-bank financial institutions, have an account with the Bank of France.

2.3 Policy on institutions: implementation of policy

The policies are transparent and in conformity with jointly agreed EU policies on participation in RTGS and the BDF Regulation (Article L. 141-8 of the Monetary and Financial Code; this latter regulation refers to the type of entities for which the Bank of France may open accounts).

Since the policy is expressed in terms of allowing accounts rather than encouraging or requiring them, there is no need for specific "implementation" of policy.

3.0 Policy on types of payments

Large-value payments and payments requiring immediate funds availability, such as monetary policy operations and end-of-day positions in other systems, should settle in RTGS using central bank money. Direct participation in the system versus non-participation is not affected - the choice is left to credit institutions to participate either directly or indirectly in the system (except as regards monetary policy operations, because counterparties to these operations have to be direct participants in the RTGS). For instance, a credit institution may participate directly in a system other than the RTGS (eg in the SSS) and have its end-of-day positions in this system settled through a direct participant in the RTGS.

Deutsche Bundesbank

(For the full text of the questions to which this information applies, see the introduction to this annex.)

1.1 Policy on interbank payment systems: content of policy

Settlement in central and commercial bank money

The systems/arrangements in Germany and their settlement methods are described in Annex 3, Table C. All these systems settle in central bank money. Debit card payments and credit card payments settle as follows:

- Debit card payments: there is no special system for the clearing and settlement of debit card transactions. These payments are handled like direct debits. Thus they are settled partly in central bank money and partly in commercial bank money.
- Credit card payments: these only partially use central bank settlement services.

RTGS and large value net settlement systems and all systemically important payment systems processing the euro (Eurosystem policy) are required to settle in central bank money (see *Minimum common features for domestic payment systems*).

Coordination between policy on systems and policy on institutions

Not applicable either for systems operated by the Bundesbank or for other systems.

1.2 Policy on interbank payment systems: implementation of policy

The policy is self-imposed.

2.1 Policy on institutions: content of policy ("required to have an account")

Generally credit institutions, which are subject to minimum reserve requirements and therefore have access to the refinancing facilities of the central bank, have to hold an account at the central bank. Credit institutions can hold operational accounts on a voluntary basis, if these institutions are subject to reserve requirements and hold their minimum reserves indirectly through an intermediary which is resident in the same member state. Generally an account is necessary for direct participation in the Bundesbank's payment systems. Funds on these accounts can be used for payment purposes.

2.2 Policy on institutions: content of policy ("allowed to have an account")

Credit institutions. Additional criteria: none, except see 2.1 above. Proportion: most. Credit: intraday credit and overnight credit is granted on a collateral basis provided the credit institution is an eligible counterparty for Eurosystem monetary policy operations and has access to the marginal lending facility ("eligible counterparty"). Direct participation in the payment systems/arrangements of the Bundesbank (such as RTGS^{plus}, ELS, RPS, AZV, simplified cheque and direct debit collection procedure) is only possible for credit institutions.

Investment firms as defined in Council Directive 93/22/EEC of 10 May 1993 and *organisations providing clearing or settlement services* subject to oversight by a competent authority can also participate in RTGS^{plus}. Additional criteria: none. Proportion: none. Credit: no.

Public authorities (eg federal government). In principle, accounts are on a voluntary basis, but federal and Länder (state) governments are obliged to have an account with the Bundesbank due to their internal regulations. Additional criteria: none. Proportion: most. Credit: according to the Bundesbank Act, they may be granted intraday credit within the framework of Article 4 of Council Regulation (EC) no 3603/93, but not overnight credit. Restrictions on use: direct participation in payment systems not allowed.

Business enterprises (non-banks) and private customers. Previously on a voluntary basis. (Additional criteria: Bundesbank opened accounts for these customers only if busy payment transactions with a large cashless turnover were expected. Proportion: a few. Credit: no. Restrictions on use: direct participation in payment systems not allowed.) Change in the access policy of the Deutsche Bundesbank: the accounts for these customers will now be closed for competition reasons by 31 December 2003.

Security carriers. Voluntary basis. Additional criteria: none. Proportion: a few (negligible). Credit: no. Restrictions on use: only for handling and distribution of cash.

Bundesbank employees. Voluntary basis. Additional criteria: none. Proportion: all. Credit: limited overdraft facilities are available. Restrictions on use: direct participation in payment systems not allowed.

Other. Correspondent banking services offered in euros are provided according to the decisions of the Governing Council of the ECB as follows:

- Non-domestic credit institutions: neither intraday nor overnight credit is allowed. Additional criteria: exceptional cases, grandfathering.
- Non-EU central banks: neither intraday nor overnight credit is allowed.
- International and European institutions: overnight credit is not allowed. Intraday credit is granted on a collateral basis. Exemption from the collateralisation requirement is decided by the Governing Council case by case.

Remote access by banks from the EEA. RTGS^{plus} holds intraday accounts (a special feature of the system) where remote access is possible: these accounts are not current accounts. Voluntary basis. Proportion: a few (negligible). Credit: no. Restrictions on use: terms and conditions for using the Deutsche Bundesbank's liquidity saving RTGS^{plus} system.

2.3 Policy on institutions: implementation of policy

The policy is made transparent in general and specific terms and conditions and additionally by (for example) statements and speeches.

The Bundesbank Act, Section 3, gives the Bundesbank the mandate to provide for the execution of payments. The Bundesbank Act also contains regulations concerning the scope of business and determines what transactions the Bundesbank is entitled to conduct (Article 19 business with credit institutions and other market participants, Article 20 business with public authorities, Article 22 business with the general public). The General Terms and Conditions of the Bundesbank set down for whom the Bundesbank may open an account. This means in practice that accounts can only be opened for those types of institutions. The Bundesbank Act can only be amended by Parliament. The General Terms and Conditions are, if necessary, amended accordingly by the Deutsche Bundesbank.

3.0 Policy on types of payments

Minimum common features for domestic payment systems:

- Principle 4 - RTGS systems: "As soon as feasible, every member state should have an RTGS system into which as many large-value payments as possible should be channelled. Such systems should settle across accounts at the central bank and have sound legal, technical and prudential features, which are compatible across EC member states."
- Principle 5 - Large-value net settlement systems: "Provided they settle at the central bank, large-value net settlement systems may continue to operate in parallel with RTGS systems but, in the near future, they should (a) settle on the same day as the exchange of the payment instruments, and (b) meet the Lamfalussy standards in full."

TARGET Guideline: "All payments directly resulting from or made in connection with (i) monetary policy operations; (ii) the settlement of the euro leg of foreign exchange operations involving the Eurosystem; and (iii) the settlement of cross-border large-value netting systems handling euro transfers shall be effected through TARGET. Other payments may also be effected through TARGET."

Hong Kong Monetary Authority

(For the full text of the questions to which this information applies, see the introduction to this annex.)

1.1 Policy on interbank payment systems: content of policy

Settlement in central and commercial bank money

The Hong Kong dollar RTGS system is a SIPS and is settled across the books of the HKMA.

The US dollar and euro RTGS systems in Hong Kong do not settle in central bank money as all transactions are settled across the books of HSBC, the settlement institution of the US dollar RTGS system, and Standard Chartered, the settlement institution of the euro RTGS system, respectively.

Credit cards and other retail payment means are settled between the banks in the Hong Kong dollar RTGS system and are not separately identified from other payment types.

Coordination between policy on systems and policy on institutions

The Hong Kong dollar RTGS system is a single-tier system. The Exchange Fund Ordinance provides that the Financial Secretary may require an authorised institution (see 2.2 below) to open a settlement account with the HKMA and the Financial Secretary has delegated this power to the HKMA. In practice, the HKMA operates a clearly stated policy of obliging all licensed banks to open settlement accounts with the HKMA. The restricted licence banks can also apply for access provided they have genuine business needs.

1.2 Policy on interbank payment systems: implementation of policy

The policy is set out explicitly. It is implemented mainly by regulation because the Exchange Fund Ordinance empowers the HKMA to require banks (authorised institutions) to open an account and also to specify the terms and conditions governing the operation of the account (a power which could be used to require a specified system to settle in central bank money). This is supplemented by legal contracts and operational guidelines.

2.1 Policy on institutions: content of policy ("required to have an account")

The Hong Kong dollar RTGS system is a single-tier system and all participants are direct participants of the system. However, there is no requirement to hold funds at the HKMA for reserve or liquidity requirement purposes. Nor is there any requirement to hold an account relating to monetary policy operations.

2.2 Policy on institutions: content of policy ("allowed to have an account")

Hong Kong maintains a three-tier system of deposit-taking institutions (authorised institutions), namely licensed banks, restricted licence banks (RLBs) and deposit-taking companies (DTCs). The licensed banks may operate current and saving accounts, and accept deposits of any size and maturity from the public and pay or collect cheques drawn by or paid in by customers. The RLBs are principally engaged in merchant banking and capital market business. The DTCs are engaged in a range of specialised activities, including consumer finance and securities business and may take deposits of HKD 100,000 or above with an original maturity of at least three months.

Given that the nature of business is different for the three tiers, the HKMA requires only licensed banks to open settlement accounts with the HKMA to settle their Hong Kong dollar transactions. For RLBs and DTCs, given that the business need for accessing the system is not high, the HKMA does not require them to open settlement accounts as the operating cost may not be justifiable. Nonetheless, the policy of access is reviewed by the HKMA from time to time and in May 2000 the HKMA relaxed the policy by allowing the RLBs to apply for access, providing the bank concerned

demonstrates a business need to do so. So far only one RLB has applied (and the HKMA has granted access).

Banks that have opened settlement accounts with the HKMA can sign a repo agreement with the HKMA to obtain interest-free intraday repo liquidity.

2.3 Policy on institutions: implementation of policy

As well as the Exchange Fund Ordinance, the policy is set out explicitly in the legal contracts between the HKMA, Hong Kong Interbank Clearing Limited (clearing operator of the Hong Kong dollar RTGS system) and the participants of the payment systems; policy statements, circulars and guidelines are issued to participants and most of them are available on the HKMA official website.

The policy is mainly implemented by regulation because, as noted above, the Exchange Fund Ordinance empowers the HKMA to require authorised institutions to open an account and also to specify how the account is used. This is supplemented by legal contracts and operational guidelines.

3.0 Policy on types of payments

No specific policy.

Bank of Italy

(For the full text of the questions to which this information applies, see the introduction to this annex.)

1.1 Policy on interbank payment systems: content of policy

Settlement in central and commercial bank money

All systems currently in operation, except international debit/credit card systems, are promoted and/or managed by the Bank of Italy and therefore they already settle in central bank money. Only international debit/credit card systems settle in commercial bank money.

Coordination between policy on systems and policy on institutions

For BI-REL, the Italian component of TARGET, rules on direct participation and on account access are synonymous. In other systems, direct participants do not have to have an account at the Bank of Italy since they can settle their position through an intermediary which is a direct participant in BI-REL.

1.2 Policy on interbank payment systems: implementation of policy

Not applicable.

2.1 Policy on institutions: content of policy ("required to have an account")

Banks hold deposits at the central bank both for payment purposes and to fulfil the compulsory reserve requirements. The reserve balances can be used for payment purposes, both during the day and within the "maintenance" period. In addition, banks can fulfil the reserve requirements indirectly through an intermediary. There are no other reasons why banks or other financial institutions have to hold an account.

2.2 Policy on institutions: content of policy ("allowed to have an account")

Credit institutions, investment firms, clearing organisations, remotely located institutions in the EEA and public sector bodies can have settlement accounts for use as direct participants in BI-REL. Various other institutions (see Table A1 in Annex 3) can be customers of the central bank.

2.3 Policy on institutions: implementation of policy

The policies are set out explicitly in the rules and regulations governing the systems. In addition, they are described in general terms in policy statements (eg the 1999 white paper on payment system oversight).

The policy does not have to be "implemented" as such since it is expressed in terms of allowing accounts rather than encouraging or requiring them.

3.0 Policy on types of payments

The Bank of Italy has always encouraged a widespread use of central bank money for the settlement of payments. At the domestic level, the net balances stemming from the transactions carried out in the national retail clearing system and the securities settlement systems must be settled in the RTGS system. Generally speaking, this does not affect direct participation versus non-participation and so since all systems settle in central bank money it affects how central bank money is used rather than whether it is used.

Bank of Japan

(For the full text of the questions to which this information applies, see the introduction to this annex.)

1.1 Policy on interbank payment systems: content of policy

Settlement in central and commercial bank money

The systems which settle in commercial bank money are the four clearing systems operated by the four types of cooperative banks (namely shinkin banks, credit cooperatives, labour credit associations, and agricultural and fishery cooperatives); the four CD/ATM systems operated by the cooperative banks; and part of the credit card and debit card clearing systems. These arrangements all settle in the central organisation of each type of cooperative bank.

Many of the local bill and cheque clearing systems also settle in commercial bank money, although these are small in terms of value; more than 70% of the total value of bills and cheques exchanged in clearing houses throughout Japan is cleared by the Tokyo Clearing House, which settles in central bank money.

Part of the cash legs of stock transactions are settled in commercial bank money. Those of stocks traded on stock exchanges and the JASDAQ market are settled either at the Bank of Japan or at one of the settlement banks, according to participants' choice. The cash legs of other stock transactions are currently settled in commercial bank money (a DVP arrangement involving settlement in central bank money is planned to be introduced in 2005).

SIPS are expected to settle in central bank money. No system is discouraged from settling in central bank money. Clearing systems and CD/ATM systems operated by cooperative banks settle in commercial bank money partly because most direct participants in those systems (cooperative banks) are not allowed to have BOJ accounts.

Coordination between policy on systems and policy on institutions

In the case of the BOJ-NET Funds Transfer System, all institutions that hold current accounts at the BOJ are automatically direct participants since it is a system for transferring funds to and from BOJ accounts.

Regarding other systems, in order for a system to settle in central bank money, all its direct participants must have accounts at the BOJ. This is set out as policy on institutional access, ie as one of the criteria for the operator of the system to open an account at the BOJ.

1.2 Policy on interbank payment systems: implementation of policy

The BOJ's policy is set out in a paper entitled "The role of the Bank of Japan in payment and settlement systems" (Bank of Japan, November 2002), where it is stated that "net obligations of participants in systemically important payment systems should preferably be settled through current accounts with the Bank".

The policy is implemented by moral suasion.

2.1 Policy on institutions: content of policy ("required to have an account")

Domestically licensed banks, branches of foreign banks, large shinkin banks and Norinchukin Bank (central organisation of agricultural and fishery cooperatives) are subject to reserve requirements and have to have an account at the BOJ for this purpose. The funds can be used directly for payment purposes.

Institutions that choose to be the BOJ's counterparties for monetary policy operations do not need to have an account.

There is no requirement that any institution be a direct participant in any system, but in practice all large banks already hold accounts at the BOJ and are therefore direct participants of the BOJ-NET

Funds Transfer System. Most large banks are also direct participants in private clearing systems that settle in central bank money.

There are no other reasons why certain financial institutions have to hold an account at the BOJ.

2.2 Policy on institutions: content of policy ("allowed to have an account")

Policy on who is allowed to have an account is expressed in terms of general criteria rather than specific types of institutions. Institutions are allowed to have accounts if this contributes to achieving the BOJ's objectives as defined in Article 1 of the Bank of Japan Law (in addition to monetary stability, "to ensure smooth settlement of funds among banks and other financial institutions, thereby contributing to the maintenance of an orderly financial system"). This is further specified as "institutions playing a key role in payments", "institutions playing a key role in securities settlement" and "institutions playing an intermediary role in the interbank market". At the moment, types of institutions holding BOJ accounts include domestically licensed banks, branches of foreign banks, shinkin banks, central organisations of cooperative banks, securities firms, money market brokers, securities finance companies, stock exchanges and bankers' associations (operators of payment systems). In addition, the institution must be financially and operationally sound and must agree to be subject to on-site examination by the BOJ.

For securities firms and bankers' associations, there are additional criteria. Securities firms must have a certain standing in the securities market, which is measured by the value of corporate and public sector bond transactions the applicant has conducted or is projected to conduct during a designated period. For bankers' associations, all direct participants of the system it operates must hold accounts at the BOJ, and settlement of net positions via the BOJ account held by the bankers' association should contribute to the safety and efficiency of interbank payments.

The BOJ allows access to both intraday and overnight credit by all "financial institutions" (as defined in Article 37 of the Bank of Japan Law) that have access to BOJ accounts, unless there are any problems. With regard to other types of account holders, the BOJ allows access to credit case by case. Where institutions other than the "financial institutions" above are not allowed access to credit, they are not subject to on-site examination by the BOJ.

In addition, the central government, foreign central banks and international financial institutions are allowed to hold accounts but without access to credit.

2.3 Policy on institutions: implementation of policy

The criteria set by the BOJ are publicly available.

Since the policy is expressed in terms of allowing accounts rather than encouraging or requiring them, there is no need for specific "implementation" of the policy.

3.0 Policy on types of payments

"The role of the Bank of Japan in payment and settlement systems" states that net obligations arising from SIPS should preferably be settled through current accounts with the BOJ. The paper also recognises that it is generally believed that other large-value interbank payments, such as those for call money transactions and the cash legs of securities trades, should be settled through BOJ accounts, and they are in practice.

The Netherlands Bank

(For the full text of the questions to which this information applies, see the introduction to this annex.)

1.1 Policy on interbank payment systems: content of policy

Settlement in central and commercial bank money

According to the Eurosystem's Minimum Common Features, large-value RTGS and net systems are required to settle in central bank money. In the Netherlands, there is only one large-value system, the RTGS system TOP.

Other systems (the retail system Interpay and the securities clearing system Clearnet) are encouraged to settle in central bank money. In fact, historically, market participants in securities clearing asked the central bank to act as settlement bank for safety reasons, while for retail payments, the neutrality aspect probably played a major role.

Only international card systems do not settle in central bank money. However, most domestic credit cards do settle at the central bank via Interpay, the Dutch retail clearing house, which clears card transactions together with other retail transactions. Interpay is a subcontractor in parts of the MasterCard issuing and transaction authorisation process and also partly processes Visa transactions.

Coordination between policy on systems and policy on institutions

TOP is operated by the DNB and participation in the system has to be in conformity with central bank rules on account access. Account holding is a prerequisite for participation in Interpay and as a clearing member in Clearnet.

1.2 Policy on interbank payment systems: implementation of policy

The policy is transparent in a general way. ESCB rules are explicit. Further policies are mainly explicit in terms of the policy objectives (oversight and risk reduction/efficiency/competitive neutrality).

ESCB requirements are implemented in national regulations. At the national level, regular contacts with market participants, in order to be aware of their concerns and wishes, and moral suasion play an important role.

Note that securities settlement took place in commercial bank money until March 1999 (and July 2000 for derivatives). Prior to these dates, the settlement function was performed by a relatively small commercial bank. With the growth of securities transactions, the daily exposures of this bank attained, during a few hours (the time span between payments to and from this bank), more than NLG 1 billion. Market participants expressed the wish to see the DNB take over the role of settlement agent.

2.1 Policy on institutions: content of policy ("required to have an account")

Supervised credit institutions are required to hold reserves at the central bank. The accounts can be used for payment purposes. Holding reserves (and thus having an account) is one of the conditions for becoming a monetary policy counterparty. Being such a counterparty is not compulsory.

There is no other requirement to hold an account. However, if one of the largest banks were not to be a direct participant in TOP this would probably raise some questions. All banks are required to hold a reserve/payment account; some banks probably do make use of correspondents for some types of transactions, but as a general rule this is rather impractical compared to direct participation.

2.2 Policy on institutions: content of policy ("allowed to have an account")

In accordance with the criteria of the TARGET Guideline, participation in the RTGS system is allowed for credit institutions and securities firms (if supervised and in the EEA), clearing/settlement

organisations and various government entities. In practice, most eligible institutions do have settlement accounts at the Bank.

Besides that, the provision of central bank correspondent accounts is at the discretion of the Bank. The provision of accounts to parties that do not have direct access to TOP is, however, only marginal, as most of these accounts were closed before the start of TARGET. The account holders are mainly IFIs and foreign central banks. The central bank's correspondent services are not subject to specific rules but they are not common practice, as the general policy line is not to compete with the private sector.

Nevertheless, the discussion about access policy has regained some importance in the light of conclusions arising from a research project on the tariff structure and infrastructure for retail payments, conducted by order of the Ministry of Finance. One of the recommendations stated that: "the Bank will, if asked for, offer an account to non-banks that are involved in the settlement of payments, provided this contributes, according to its judgment, to the improvement of the efficiency of the financial infrastructure". As a follow-up, the Bank is now studying the implications of this recommendation for itself and for the parties that could be concerned. If account access is granted to non-banks, these will not have direct access to TOP but will use the central bank as a correspondent.

2.3 Policy on institutions: implementation of policy

The policy is transparent. The question of implementation does not directly arise since the policy is expressed in terms of allowing accounts rather than encouraging or requiring them.

3.0 Policy on types of payments

The DNB would prefer to see large-value payments settled in central bank money through the RTGS system. However, there is no formal requirement for direct participation or restriction on the use of other systems.

Monetary Authority of Singapore

(For the full text of the questions to which this information applies, see the introduction to this annex.)

1.1 Policy on interbank payment systems: content of policy

Settlement in central and commercial bank money

Systems which do not settle in central bank money include the US dollar cheque clearing system, EFTPOS, cash dispensers and the ATM network, as well as the Central Depository Pte Ltd (CDP).

MEPS, the Singapore dollar cheque clearing system and the Interbank Giro systems settle in central bank money. The MAS would also encourage the CDP to settle in central bank money. There are no systems which are discouraged from settling in central bank money or which are not allowed to do so.

Coordination between policy on systems and policy on institutions

This is not an issue as MEPS is owned and operated by the MAS.

1.2 Policy on interbank payment systems: implementation of policy

MEPS is operated by the MAS and so the issue of implementation does not directly arise.

2.1 Policy on institutions: content of policy ("required to have an account")

Up to mid-2002, only banks were allowed access to MEPS. However, not all banks choose to do so nor does the MAS require them to use MEPS. From December 2002, the MAS Act was amended to allow non-banks of systemic importance, with the approval of the MAS, to participate in MEPS.

All banks in Singapore are required to maintain minimum cash balances (MCB) with the MAS of not less than 3% of total liabilities (averaged over a two-week maintenance period). Banks may on an intraday basis use the full amount in their accounts, including the 3% MCB, to settle their payments under MEPS. Banks must, however, restore their reserve account balance to at least 2% of the liabilities base by the end of the day.

Institutions that choose to be the MAS's counterparties for monetary policy operations do not need to have an account. There are no other reasons why an account is required.

2.2 Policy on institutions: content of policy ("allowed to have an account")

The MAS only accepts applications for accounts by banks, as well as non-banks of systemic importance and the Singapore government. In addition, the MAS also acts as nostro agent for other central banks/monetary authorities and international banks/international monetary authorities established under governmental auspices.

As at 2000, about 67% of banks were direct participants in MEPS.

An end-of-day facility is provided to allow banks to borrow Singapore dollar funds from the MAS via overnight Singapore Government Securities (SGS) repos. The MAS may, where necessary, extend intraday credit through primary dealer banks to resolve systemic payment gridlocks. The intraday credit from the MAS must be collateralised with SGSs.

The MEPS account is to be used for performing Singapore dollar interbank funds transfers and the settlement of SGSs.

2.3 Policy on institutions: implementation of policy

The policies are set out in regulations. The MAS Act states "The Authority may establish and operate one or more real-time gross settlement systems for the transfer of funds, the settlement of payment

obligations and the transfer and settlement of book-entry securities and instruments between or among participants approved by the Authority". According to the Act a "participant" is "a person approved by the Authority to be a participant of a settlement system and shall include the Authority where it participates in the settlement system".

3.0 Policy on types of payments

No policy.

Sveriges Riksbank

(For the full text of the questions to which this information applies, see the introduction to this annex.)

1.1 Policy on Interbank payment systems: content of policy

Settlement in central and commercial bank money

The Riksbank does not have an explicit policy on what systems are required to settle in central bank money. However, the Riksbank has endorsed the Core Principles and the SSS recommendations as standards to be followed. According to the Core Principles, SIPS should preferably settle in central bank money. The Riksbank considers the RIX system (the LVPS operated by the Riksbank), the VPC system (the SSS/CSD) and the derivatives clearing system operated by Stockholmsbörsen (the Stockholm Exchange) as SIPS. The Riksbank has also encouraged the Bank Giro system and interbank systems operated by the BGC, such as Data Clearing, to settle in the RIX system, ie in central bank money.

Only Visa does not settle in central bank money. (The Postgiro is an in-house system in a commercial bank, and can be regarded as a "quasi-system".)

Coordination between policy on systems and policy on institutions

This is not applicable for RIX - since the Riksbank owns the system. For other systems, direct participants in systems in practice have to meet Riksbank access criteria, or use a settlement bank that does (eg clearing members in the SSS/CSD must use a settlement bank that meets the access criteria and is a participant in the RIX system - could be the clearing member itself - according to the rules of the SSS/CSD).

1.2 Policy on interbank payment systems: implementation of policy

The Riksbank has openly endorsed the Core Principles, and it is clear to all market participants that the Riksbank expects SIPS to settle in central bank money. The policy is implemented by moral suasion.

2.1 Policy on institutions: content of policy ("required to have an account")

The Riksbank does not apply reserve requirements.

Not all monetary policy operations require an account with the Riksbank (an account is required for the usage of standing facilities and fine-tuning operations). No institutions are obliged to be counterparties to the central bank.

In order to avoid unnecessary concentration of payment flows in an already concentrated bank market, institutions with larger payment flows are encouraged to become direct participants. Furthermore, major banks must have accounts in the central bank if they want to offer a full range of services to their securities customers.

2.2 Policy on institutions: content of policy ("allowed to have an account")

The following may open a Swedish krona *settlement* account:

- credit institutions (according to the EU definition, which includes a number of institutions that are regarded as investment firms according to Swedish legislation);
- other investment firms (but only if they are counterparties in the Riksbank's money market operations, in which case they *have* to have an account);
- clearing organisations;

- government agencies (which are responsible for central government payments and cash management);
- remote access participants that fall into one of the above categories and central banks.

There is no such concept as an indirect account holder (participant in the interbank payment system).

Remote access is not restricted to the EEA. There is currently only one bank that is approved as a remote participant.

Account holders are allowed both intraday and overnight credit, except clearing houses and government agencies (intraday credit only). This applies to remote account holders as well.

For accounts in euros the same policy applies, with the exceptions that there is no overnight credit and intraday credit is restricted to participants with a presence in Sweden. Remote access is only accepted for EEA institutions.

IFIs and central banks may open a krona *correspondent* account. Correspondent account holders are not allowed credit.

2.3 Policy on institutions: implementation of policy

The policy is set out in the regulations for the RIX system (and in the terms and conditions for correspondent accounts).

The question of how the policy is implemented is not directly applicable since it is expressed in terms of allowing accounts rather than encouraging or requiring them.

3.0 Policy on types of payments

Larger customer and interbank payments should settle in central bank money - but this does not affect direct participation versus non-participation and can thus be thought of as a policy on how systems should settle.

Swiss National Bank

(For the full text of the questions to which this information applies, see the introduction to this annex.)

1.1 Policy on interbank payment systems: content of policy

Settlement in central and commercial bank money

SIPS are expected to settle in central bank money.

Provided that direct participation in a system is consistent with the SNB's access policy, any system or its participants would be allowed to settle in central bank money. For instance, the SNB has encouraged various retail payment systems to settle in central bank money, mainly for efficiency (liquidity saving) reasons.

Only credit card systems settle in commercial bank money.

Coordination between policy on systems and policy on institutions

Direct participants in systems settling in central bank money have to meet the SNB's access criteria.

1.2 Policy on interbank payment systems: implementation of policy

No formal regulation exists. However, the basic principles of the SNB's policy are explained in a policy paper which was published in the SNB's *Quarterly Bulletin* in spring 2003.

The policy is currently implemented via moral suasion. However, the new Law on the SNB, to be enacted in 2004, will give the SNB a more formal legal basis to require SIPS to settle in central bank money.

2.1 Policy on institutions: content of policy ("required to have an account")

Banks are not required to hold an account with the SNB. Those that do have an account are not required to hold reserves. Although liquidity requirements exist, these may be met by a combination of cash held in vaults, balances at Postfinance and central bank balances. Banks could thus meet liquidity requirements only by holding vault cash and/or balances at Postfinance. Funds that are held at the SNB can be used directly for payment purposes.

There is no requirement to participate in monetary policy operations.

There are no other requirements to hold an account. However, if one of the larger banks were not a direct participant in SIC, the SNB would be concerned and might address this issue with the Federal Banking Commission.

2.2 Policy on institutions: content of policy ("allowed to have an account")

Banks, securities dealers, clearing houses and banks located abroad may have accounts at the SNB and are allowed, in principle, to directly participate in SIC. However, remote access to SIC is only provided to international joint ventures and clearing organisations, as well as to the banks that are direct participants in such arrangements, provided they make a sizeable contribution to the reduction of systemic risk or are of major significance to the Swiss financial centre. In practice, almost all eligible (domestic) banks do have accounts (ie there is virtually no tiering), whereas only a few securities dealers have accounts.

In addition to direct participants in interbank payment systems, government entities, corporates (if need is proved), central bank employees, international organisations based in Switzerland, other central banks and IFIs are allowed to have accounts as ordinary customers of the SNB.

2.3 Policy on institutions: implementation of policy

The policy is explicitly stated in the Law on the SNB and/or in SNB directives. The policy is implemented by regulation.

3.0 Policy on types of payments

There is currently no specific policy in terms of types of payments. However, the types of payments a system settles are taken into account in the SNB's assessment of the system's systemic importance, and the new Law on the SNB will make provision for requiring SIPS to settle in either central bank money or any other asset that is deemed to be sufficiently safe (eg settlement on the accounts of CLS Bank).

Bank of England

(For the full text of the questions to which this information applies, see the introduction to this annex.)

1.1 Policy on interbank payment systems: content of policy

Settlement in central and commercial bank money

Systems typically settle in central bank money. Exceptions are credit card schemes and one debit card scheme (Visa Debit).

SIPS are required to settle in central bank money. Systems of "system-wide importance" (see main text) are permitted to do so. Other systems are discouraged from settling in central bank money unless they can make a good case (eg on efficiency or neutrality grounds).

Coordination between policy on systems and policy on institutions

Under the Bank's policy (set out in the Bank's recent policy statement), it is up to the system to decide who can be a direct participant. The Bank would normally open a settlement account for all direct participants in a system for which it acted as settlement agent. An element of discretion is retained, however, to allow the Bank to refuse access to an account on risk or wider public policy grounds.

1.2 Policy on interbank payment systems: implementation of policy

The Bank's policy is set out in a public statement, which can be found on the Bank's website (www.bankofengland.co.uk). It is implemented through bilateral discussion with applicants.

2.1 Policy on institutions: content of policy ("required to have an account")

No institution is required to have a settlement or other account at the Bank. Nor are there any related requirements which might imply the need for an account. For example, although banks with eligible liabilities over GBP 400 million have to provide "cash ratio deposits" to the Bank (the interest on which is one source of finance for the Bank's official activities), CRDs need not be held in the depositing institution's account. Similarly, counterparties for open market operations may use a commercial bank to make/receive payments relating to monetary policy operations.

2.2 Policy on institutions: content of policy ("allowed to have an account")

Under the Bank's policy, the presumption is that all members of a system for which the Bank acts as settlement agent are eligible to maintain an account for use in the context of their activities in that system. But applications would be considered case by case and the Bank retains the discretion to refuse to open a settlement account where necessary to protect its position or in pursuit of public policy goals. This policy applies to banks and non-banks, including, in some cases, non-financial institutions. It also applies to both resident and non-resident institutions, although further conditions might be applied to those accessing remotely, including the need to obtain a legal opinion addressing possible conflicts of law and an assessment of the applicable supervisory regime.

Credit is generally limited to banks (resident and non-resident), but securities firms may be allowed credit where it is clearly needed to support their participation in the relevant system and where there are systemic benefits to providing credit (or conversely where its absence could generate risk of, for example, illiquidity). Clearing houses would be dealt with case by case - for instance, the Bank provides limited credit facilities to the London Clearing House in the context of its activities in CREST.

In practice, all direct participants in the high-value payment systems (and most participants in the other systems) are banks. Currently, no securities houses are direct members of any significant interbank payment systems. A small number of non-financial institutions maintain accounts (but without access to credit) in the context of their LINK (ATM clearing) membership.

In addition to direct participants in interbank payment systems, government bodies, central bank employees, other central banks and international financial institutions are also allowed accounts as ordinary customers of the Bank.

Different eligibility rules apply to the Bank's monetary policy counterparties.

2.3 Policy on institutions: implementation of policy

The Bank's policy is set out in a public statement, which can be found on the Bank's website. It is implemented through bilateral discussion with applicants.

3.0 Policy on types of payments

No discrete policy exists on payment methods.

Federal Reserve System

(For the full text of the questions to which this information applies, see the introduction to this annex.)

1.1 Policy on interbank payment systems: content of policy

Settlement in central and commercial bank money

The Federal Reserve makes settlement services in central bank money available to private interbank payment systems, but none of these systems is required to use these services. The systems themselves must choose how best to conduct their settlements and whether the terms and conditions of the Federal Reserve's services meet their needs. Settlement arrangements for systemically important and certain other systems are reviewed based on the design and risks of the particular system.

Coordination between policy on systems and policy on institutions

Federal Reserve policies on account access and services determine who may be a direct participant in systems operated by the Federal Reserve. Private systems determine their own participation structure, subject to relevant laws and policy. If a private system uses the Federal Reserve's settlement services, then the Federal Reserve's policies on access will influence who may settle directly on the books of the Federal Reserve Banks.

1.2 Policy on interbank payment systems: implementation of policy

The Federal Reserve makes its policies on interbank payment systems publicly available. Policies governing Federal Reserve operated payment systems and the use of intraday Federal Reserve credit are included in Federal Reserve Board regulations, Federal Reserve Bank operating circulars (the contractual agreements between the Reserve Banks and their customers), the *Federal Reserve policy statement on payments system risk* and associated material that provides more detailed guidance, and other policy statements. One key source for material is the *Federal Reserve regulatory service*, which contains Board regulations as well as authorising statutes, policy statements, interpretations, commentaries and opinions.

2.1 Policy on institutions: content of policy ("required to have an account")

Banks and other depository institutions are not necessarily required to hold an account or to hold funds at a Federal Reserve Bank. However, members of the Federal Reserve System, including both national banks, which are required to be members, and state-licensed banks or other depository institutions, which have chosen to be members, must hold an account in order to meet their reserve requirements, unless they can meet them solely through cash in their vault.

Other than this policy relating to reserve requirements, the Federal Reserve does not require financial institutions to hold an account at a Federal Reserve Bank. In particular, there is no requirement that the central bank's counterparties for monetary policy operations must have an account. However, the internal rules of certain private systems may require that a direct participant or the operator have access to an account at the Federal Reserve.

The policy is implemented through a variety of means, as appropriate, including regulation, operating circulars, which represent contractual agreements between the Federal Reserve Banks and account holders, and policy statements, as well as supervisory and payment system oversight activities.

2.2 Policy on institutions: content of policy ("allowed to have an account")

Depository institutions, including both domestically chartered institutions and US branches and agencies of foreign banks, are allowed to have an account at a Federal Reserve Bank. State-licensed trust companies that are members of the Federal Reserve System, such as the Depository Trust Company, and Edge Act corporations, such as CLS Bank, along with certain other institutions are

allowed to have accounts. In addition, a limited selection of government entities, other central banks, international financial institutions, such as the IMF, and certain government-sponsored institutions, such as the Federal Home Loan Banks, are allowed to maintain accounts. The Federal Reserve also maintains accounts operated by clearing houses, but only if those accounts are held either in the name of a clearing house that has a banking or similar licence, as is the case for CLS Bank, or in the name of the deposit-taking institutions that have such licences and are participants in the clearing arrangement, as is the case for CHIPS.

Depository institutions with regular access to the discount window are generally eligible to access intraday credit. The Federal Reserve may restrict a depository institution's privilege to incur overdrafts in its account, for example, if the institution is in weak financial condition or does not manage its account according to the Federal Reserve's overdraft policies. Institutions with an account at a Federal Reserve Bank that do not have regular access to the discount window, typically institutions that are not subject to reserve requirements, are generally expected to refrain from incurring daylight overdrafts in their Federal Reserve accounts.

2.3 Policy on institutions: implementation of policy

Policies on membership in the Federal Reserve System and account access are established in the Federal Reserve Act and various other statutes. The Federal Reserve *Policy statement on payments system risk* explains the general methods used by the Federal Reserve to grant and control intraday credit. The Federal Reserve has also prepared two other documents to assist depository institutions in implementing the Board's policies: first, an *Overview of the Federal Reserve's payments system risk policy*, which provides a summary of the Board's policies; and second, a *Guide to the Federal Reserve's payments system risk policy*, which explains in detail how the Board's policies apply to different institutions and includes information on procedures and other aspects of the policy.

The policy is implemented through a variety of means, as appropriate, including regulation, operating circulars, which represent contractual agreements between the Federal Reserve Banks and account holders, and policy statements, as well as supervisory and payment system oversight activities.

3.0 Policy on types of payments

As a general matter, the Federal Reserve does not have a policy on how particular types of payments should be made.

Annex 2
Access policy - specific cases

The factors discussed in Section 4.1 that are relevant to any review of access may be illustrated by considering the cases of particular types of institution which are not currently allowed access to settlement accounts in all countries, but which could potentially seek access. The following is not intended to be a complete exposition of the arguments in favour of or against allowing each type of institution access to an account, but rather to illustrate the sort of factors the relevant central bank is likely to take into account. It considers, in turn, non-resident banks, securities firms, insurance companies, non-financial corporates and certain specialist payment service providers.

(i) Non-resident banks

Section 2 highlighted the implications of globalisation, and the associated increases in cross-border payment flows, for the use of correspondent banking networks. It suggested that one reason for the use of correspondent banks was non-resident banks' inability, in many countries, to access the local interbank payment system directly. It is not, however, certain that many would necessarily choose remote access even if it were permitted. All CPSS central banks permit access by banks chartered overseas but with a local branch presence and banks with large foreign currency activity might be expected to maintain such a presence.

But it is still quite possible to imagine circumstances in which banks might make use of remote access to foreign payment systems. This might be the case with, for example, nationally based banks without global branch networks but with sizeable foreign exchange-related payment flows. It could also be the case with banks seeking to manage global, or at least regional, payment flows centrally, from a single location, despite having branches in the relevant countries. There are other examples. Overall, therefore, it is not clear whether there would be significant demand for remote access to CPSS payment systems from banks currently unable to obtain it.

In considering the possibility of remote access, it is clearly difficult to identify major functional differences between resident banks and non-resident banks; other things being equal, commercial banks perform broadly the same functions regardless of the centre in which they are located. Reasons used to justify distinguishing between the two categories include burdens and privileges, communication and risk.

Taking these in turn, as noted in Section 3.2.1 in some countries access to the central bank is seen as part of a package of privileges and burdens. As an extension of that view, it may be argued that only institutions which make some contribution to the local financial sector and economy should be granted the privilege of access directly to central bank liabilities in that country.

Also relevant is the view that use of an interbank payment system requires a local operational presence to facilitate communication with the payment system operator and overseer and with other direct participants. Particularly where operational problems arise, face-to-face discussion - and a common language - can be essential if a rapid solution is to be found.

But the primary argument usually deployed in favour of limiting access to resident institutions is based on risk. Dealing with institutions resident in other jurisdictions is felt by many central banks to involve unacceptable legal risks, and perhaps credit risks too where the institutions are based in a jurisdiction in which, for example, prudential supervision and accounting standards are not felt to be rigorous, or where sovereign risk is significant. And some central banks believe that credit risk can only be acceptably addressed where regulation is carried out by the central bank itself - ie (in some countries) for resident banks.

On the other hand, it is true that there may be ways of obtaining assurance over the extent of legal risks, for example by seeking legal opinions on the degree of consistency between local and foreign laws. Legal developments are beginning to address certain aspects of legal risk - with, for example in the EU, the implementation of the Settlement Finality Directive and the prospective Collateral Directive; and, on a broader geographic scale, the implementation of the Hague Convention on

securities held with an intermediary.[50] Moreover, standardisation of prudential supervisory (and accounting) techniques is limiting the extent to which central banks need to distinguish between resident and non-resident banks. Nevertheless, arguments in favour of limiting access to resident institutions are perfectly coherent because such risks can never be eliminated and may be substantial in many cases.

(ii) Securities firms

An important question for central banks is how far the differences between securities firms and commercial banks justify different policy treatment; whether the payment-related exposures which arise, perhaps partly in consequence of that treatment, are sufficiently large to be worrying; and whether there is or might be any pressure from securities firms for more direct access to the payment system.

Even in those CPSS countries where access is not already permitted, there is no widespread evidence of securities firms seeking direct access to the payment system. That presumably reflects broad satisfaction with the service available from the banks which currently provide securities firms with correspondent and custody services. Were such evidence to emerge, however, a number of arguments are likely to be deployed for and against allowing access.

Arguing against allowing access are the many differences between securities firms and commercial banks. Securities firms are not payment service providers, except in the limited sense that payment-related services are incidental to the service they give their customers. In most cases, their liabilities do not function as money, and they are not integral to the functioning of the payment system in the way that banks are. They are generally felt to be involved in higher-risk activities than commercial banks and to present greater counterparty risk. Partly in consequence, regulatory capital requirements in many countries are aimed at orderly liquidation of securities firms rather than at trying to ensure firms can continue as a going concern.

On the other hand, arguing in favour of allowing access is the fact that securities firms account for a very significant proportion of activity in, for example, the major securities markets, meaning that they are responsible for making and receiving large values of payments, both on their own behalf and on behalf of clients. In accessing the payment system, securities firms may incur very sizeable credit exposures to their correspondent banks (in respect of the proceeds of trades), or vice versa (in relation to credit provided to finance purchases). They may also hold significant amounts of money for clients (albeit as client monies, rather than as deposits). They are, in some respects, functionally similar to banks, with which - in certain markets - they are in direct competition. Prudential supervision of securities firms has progressed in recent years and regulatory developments have, in some important areas, reduced the differences of approach between the supervision of banks and that of securities firms.

(iii) Insurance companies

Similar arguments might be deployed in relation to insurance companies, although the differences to banks would probably be given greater prominence. Like securities firms, insurance companies account for increasingly large values of payments. More so than securities firms, however, a significant proportion will be managed by other institutions - primarily custodians - acting on insurance companies' behalf. Perhaps for this reason, there is, in most CPSS countries, little evidence of demand from insurance companies for direct access to interbank payment systems.

Like securities firms, insurance companies are to some extent in direct competition with banks. This is, however, in what most bankers would consider a niche area, and competition is not as broad as that between banks and securities firms in the securities markets. Insurance companies are also regulated but, again, in most countries regulation of insurance companies is at a relatively early stage of development. And, like securities firms, insurance companies are typically not payment service

[50] References: (a) *Directive on settlement finality in payment and securities settlement systems*, May 1998; (b) *Proposal for a directive of the European Parliament and of the Council on financial collateral arrangements*, March 2001; and (c) *the Hague convention on the law applicable to certain rights in respect of securities held with an intermediary*, December 2002.

providers (even in a very limited sense), do not take deposits and would consequently, in many countries, be unlikely candidates for direct access to the payment system.

(iv) Non-financial corporations

There is also little evidence of non-financial corporations seeking direct access to high-value payment systems, and the arguments in favour of granting it would in any event be weak. Such corporations are payment service users, not providers; they do not create "money"; they do not, as a consequence of their payment activities, generate or incur financial risk of a scale likely to be systemic if it materialised; and they do not compete with banks directly. They tend to rely heavily on banks to manage flows of funds - an area in which corporates generally have less expertise. On the face of it, there is little reason for them either wanting, or being granted, access to settlement accounts in that context.

However, there might possibly be a higher level of demand for direct access to lower-value systems in certain countries, given that technology has reduced the cost for corporations of managing (for example) their staff salary payments and invoicing processes. In that event, the factors the central bank would need to take into account would relate mainly to cost, efficiency, consistency of treatment and the risk to its own balance sheet; it is highly unlikely that systemic risk issues would arise.

On the one hand, it might be argued that requiring such institutions to settle via a financial institution imposes an essentially arbitrary distinction between users of payment systems and imposes avoidable costs on corporations. If corporations have the technical ability to input their own payment instructions and access to the necessary liquidity, they should perhaps be allowed to assume responsibility for the process of settlement.

On the other hand, however, it is arguable that such an argument ignores moral hazard issues which would arise (as elsewhere) through such a marked broadening of the central bank's (intraday) counterparties. It also ignores the screening role which banks play in relation to non-financial users of the financial system. Commercial banks may be better placed than central banks to manage financial risk. They have access to a broader set of data, probably greater expertise and are able to achieve economies of scale in risk management which would be unavailable to many central banks. Allowing their traditional customers direct access to the payment system might result in central banks performing a task better carried out by the commercial sector.

Central banks could, moreover, legitimately explore whether corporations had a sound business case for direct access to a settlement account. In the event that central banks were unwilling to incur credit exposure to a non-financial company, corporations would need to source liquidity from a bank (probably the bank they use in other contexts), and accounts would need to be prefunded. This would impose costs on the corporate, and risks on the system were it unable to meet this need consistently. Corporations' most natural relationship is with a commercial bank, not a central bank. Moreover, by dealing directly with them, central banks could significantly influence the degree of competition in what may already be a very low margin business for banks. In the absence of any indication of market failure or a failure of competition, it is difficult to see a conclusive policy or business case for providing settlement accounts to such entities.

(v) Specialist payment service providers

Finally, there is the particular case of specialist service providers such as clearing houses (including securities settlement system operators) or ATM operators, at least some of which have already sought (and been granted) access to settlement accounts in many countries.

Clearing houses generally need some form of access to banking facilities to enable direct participants to fund and defund accounts, typically at the end of the business day before and after net settlement. But access to a central bank account is not a necessary condition of providing such a service. Clearing houses might choose to use a commercial bank account without affecting the day to day effectiveness of the clearing. Or they might simply be responsible for operating an account legally owned by their direct participants.

The case for clearing houses having access to settlement accounts generally rests on the need to eliminate financial and operational risks that would otherwise arise, and/or (for the retail clearings) on the integral role the clearing house plays in the operation of the clearing, where its central role in the provision of payment services, and its very uniqueness, argue for "special" treatment. Even where that is so, however, central banks are rarely willing to incur direct financial exposure to such account holders, and credit is rarely provided.

Similar arguments apply in the case of specialist service providers such as ATM operators. These providers' business tends to relate to the provision and settlement of retail rather than wholesale payment instruments, so the values involved are typically low, although the volumes may be very high. For such entities, cost and efficiency considerations, rather than risk issues, are generally the primary concern, both for the provider and for the central bank.

Again, therefore, the case for allowing such entities access to settlement accounts is not straightforward. The service they provide is not reliant on access to a central bank account; the requisite services would be available from commercial banks. Again, the case for access to a settlement account may rest on the proposition that the service provided is so integral to the settlement of a payment instrument (as operation of ATMs clearly is for cash withdrawal services) as to merit treatment comparable to other direct participants in the relevant interbank payment system. The arguments are not conclusive, but have been sufficient to persuade at least one central bank (the Bank of England) to allow such entities access to account facilities (but not credit) in the context of their membership of an ATM clearing.

Annex 3
Detailed tables

Table A1

Accounts held at the central bank: which institutions have accounts?

Position at end-2002

	Financial institutions located in the country[1,2]				Remote access banks[2]	Other account holders[2]						
	Banks	Non-bank clearing houses	Non-bank securities firms	Other non-bank FIs		Central government	Other government	Central bank employees	Corporates	General public	Other central banks[3]	IFIs
Belgium	v	v	v	a	v[4]	v	v	–	v[5]/–	–	v	v
Canada	v	v	a	a	–[6]	v	–	–	–	–	v	v
France	v	v	v	–	–[7]	v	–	v	v/(gf)[8]	(gf)	v	v
Germany	v	v	v	v[9]	v[10]	v	v	v	(gf)[11]	–	v	v
Hong Kong SAR	c	–	–	v[12]	–	–	–	–	–	–	–	–
Italy	v	v	v	–	–[7]	v	v	–	–	–	v	v
Japan	v/–[13]	v	v[14]/–	v[15]/–	–[6]	v	–	–	–	–	v	v
Netherlands	v	v	v	–	–[7]	v[16]	(gf)[17]	–	–	–	v	v
Singapore	c	v	–	–	–	v	–	–	–	–	v	v
Sweden	v	v	a[18]/–	–	v[19]	v	–	–	–	–	v	v
Switzerland	v	v	v	v[20]	v[6]	v	v	v	–	–	v	v
United Kingdom	v	v	a[21]	a[21]	v[6,22]	v	v	v	(gf)/v[21]	–	v	v
United States	c[23]/v	–[24]	–	–[25]	–	v	–/v[26]	–	–	–	v	v

Note: Domestic currency payment accounts. Subject to relevant criteria being met, applies to all institutions in the relevant category unless indicated. For an explanation of the footnotes, refer to the end of the table.

Table A1 (cont)

Accounts held at the central bank: which institutions have accounts?

Position at end-2002

Key:

c	compulsory
v	voluntary
a	allowed in principle but in practice no accounts
(gf)	some grandfathered accounts only
–	not allowed

Where two symbols are shown (eg c/v), see relevant footnote for explanation of which institutions each symbol applies to.

General notes:

[1] c (rather than v) is shown **only** in cases where an account is compulsory for other reasons than (a) reserve requirements (unless the account on which reserves are held can also be used for payment purposes, in which case c **is** shown) or (b) for institutions that choose to be central bank counterparties for monetary policy operations or (c) for institutions that choose to be direct participants in interbank payment systems that settle in central bank funds. [2] Unless otherwise indicated, financial institutions located in the country and remote access banks have settlement accounts, while other account holders have customer accounts. [3] For EU central banks, the special accounts used in connection with TARGET are not referred to here.

Country-specific notes:

[4] Currently, only one bank from outside the EEA has a remote account (and this is a correspondent rather than a settlement account - ie the bank is not a direct participant in an interbank payment system). [5] Some accountancy firms have accounts at the NBB for purposes of payment to the Central Balance Sheet Office. [6] CLS Bank has remote access to accounts at the Bank of Canada and the Bank of Japan even though remote access is not normally allowed. It is also one of the institutions with remote access to the Swiss National Bank and the Bank of England. (CLS also has remote access to the ECB and the Reserve Bank of Australia.) [7] Only banks located elsewhere in the European Economic Area are allowed remote access (see footnote 31 in main text). [8] Cash carriers on a voluntary basis, grandfathering for other firms. [9] Refers to security carriers. [10] Non-resident credit institutions maintain settlement and correspondent accounts at the Bundesbank. However, settlement accounts are held only by EEA credit institutions, which therefore participate directly in RTGS^{plus}. [11] Remaining accounts will be closed by end-2003. [12] Restricted licence banks may apply to open an account (the HKMA has recently granted approval to a restricted licence bank to access the Hong Kong dollar RTGS system). [13] Most cooperative banks are not allowed accounts. [14] Depends on the scale of payment activity of the securities firm (see Annex 1, section on Japan). [15] Money market brokers, securities finance companies and specialised public sector financial institutions. [16] The central government's account is a settlement account not a customer account. [17] Local government is not allowed, but a few semi-governmental organisations (public pension and social security funds) do have (grandfathered) accounts. [18] Relates to securities firms (according to Swedish domestic legislation) that are regarded as credit institutions according to EU legislation. [19] Close to an "a", since only one foreign bank is a remote participant in the RTGS system. [20] Currently only Postfinance. [21] The Bank of England will normally be prepared to grant accounts to all members of interbank payment systems for which it acts as settlement agent, although applications will be considered case by case and the Bank has discretion to refuse access on risk or other policy grounds. In practice, account holders are currently mainly banks, and a small number of non-financial institutions in the context of LINK (ATM) settlement. The Bank has not yet been asked to consider an application from either a securities house or any other form of non-bank financial institution. [22] Non-resident account holders may face additional requirements, eg to obtain a legal opinion addressing possible conflicts of law. [23] Members of the Federal Reserve System, including both national banks, which are required to be members, and state-licensed banks or other depository institutions, which have chosen to be members, must hold an account in order to meet their reserve requirements unless they can meet them solely through cash in their vault. These accounts may be used for payment-related activity. [24] A clearing house may have access to an account at a Federal Reserve Bank if the clearing house has a banking or similar licence or if the account would be maintained in the name of participants in the clearing arrangement that have such licences. [25] Government-sponsored enterprises, such as the Federal Home Loan Banks, have been granted access to an account through statutory authority. [26] At the request of the Treasury, state-owned limited purpose trust companies may be granted access to facilitate their purchase of US government securities.

Table A2

Accounts held at the central bank: is credit available on the account?

Position at end-2002

	Financial institutions located in the country				Remote access banks	Other account holders						
	Banks	Non-bank clearing houses	Non-bank securities firms	Other non-bank FIs		Central govern-ment	Other govern-ment	Central bank employees	Corporates	General public	Other central banks	IFIs
Belgium	I/O	I[B1]	I[B1]	No	No	I[B1]	No	–	No	–	No	No
Canada	I[C1]/O	No	I[C1]/O	I[C1]/O	–[C2]	O[C3]	O[C3]	–	–	–	No	No
France	I/O	No	I/O	–	–[F1]	No	–	I/O	I/O	I/O	I/O[F2]	No
Germany	I/O[G1]	No	No	No	No	I	I	O	No	–	I/O[F2]	I
Hong Kong SAR	I/O	–	–	I/O	–	–	–	–	–	–	–	–
Italy	I/O	I[I1]	I[I1]	–	–[F1]	No	No	–	–	–	No	No
Japan	I/O	No[J1]	I/O	I/O	–[C2]	No	–	–	–	–	No	No
Netherlands	I/O	I[N1]	I	–	–[F1]	I	I	–	–	–	No	No
Singapore	I[S1]/O	No	–	–	–	No	–	–	–	–	No	No
Sweden	I/O	No	I/O	–	I/O	I	–	–	–	–	I	No
Switzerland	I/O	I	I/O	I/O	I/O[C2]	No	I/O	No	–	–	No	I/O
United Kingdom	I/O[U1,U2]	I[U1,U2]	I/O[U1,U2]	No[U2]	I/O[U1,C2]	No	No	No	No	–	No	No
United States	I/O[U3]	–	–	–	–	No	No	–	–	–	No	No

Note: Availability of intraday and overnight credit in domestic currency to institutions with accounts as shown in Table A1, subject to relevant criteria being met. Unless otherwise indicated, applies to all institutions in that category that have an account and refers to some form of standing facility available at the request of the account holder. Excludes any kind of emergency support or facility. Note that in some cases institutions *without* accounts may also be given credit; such cases are *not* shown here. For an explanation of the footnotes, refer to the end of the table.

Table A2 (cont)

Accounts held at the central bank: is credit available on the account?

Position at end-2002

Key:

I	Intraday credit only
O	Overnight credit only
I/O	Intraday and overnight credit
No	No credit
–	Not applicable (as shown in Table A1, this type of institution is not allowed to hold an account)

[B1] Specific authorisation by the NBB is required. [C1] The Bank of Canada provides intraday credit in the form of a fully collateralised guarantee against net debit positions arising in Tranche 1 of the LVTS system. [C2] CLS Bank does not have access to credit. [C3] On very rare occasions. [F1] "Not applicable" for banks located outside the European Economic Area (accounts not allowed). For banks inside the EEA, accounts are allowed (see Table A1) but no credit is given. [F2] If located in the European Union. Credit not available for other central banks. [G1] For credit institutions that are eligible counterparties for Eurosystem monetary policy operations. [I1] All RTGS system participants are eligible for intraday credit; currently only banks use intraday credit. [J1] Except that the Tokyo Stock Exchange has access to intraday credit. [N1] Under exceptional circumstances (based on collateral provided by the clearing members). [S1] The MAS may, where necessary, extend intraday credit through primary dealer banks to resolve systemic payment gridlock. [U1] Within each category, only certain institutions are eligible to receive intraday/overnight credit from the Bank of England. In the case of clearing houses, only LCH is currently eligible for intraday credit (by virtue of the Bank acting as its CREST settlement bank). [U2] In principle, any "regulated institution" may have access to intraday credit where the scale of their own payment activities would make them significant direct participants in a SIPS and when doing so would reduce risk for the financial system. In practice, it is highly unlikely that any FI other than a bank and, perhaps, a large securities firm would qualify. [U3] Institutions that do not have access to the discount window, such as Edge Act corporations, and accounts that are held for settlement purposes, such as those held in the name of a clearing house, are not provided with overnight or intraday credit.

Table A3

Accounts held at the central bank: number and value

Position at end-2000

	Number of payment accounts (thousands)				Value of overnight balances on payment accounts (USD billions)					
	Total	**Held by banks locally**	**Held by banks remotely#**	**Other**	**Total**	**Held by banks locally**	***Of which: (a) required reserves***	***Of which: (b) free reserves***	**Held by banks remotely#**	**Other**
Belgium	0.45	0.33	0.07	0.05	6.63	nav	*nav*	*nav*	nav	nav
Canada	0.014	0.013	nap[C1]	0.001	0.349	0.349	*0*	*0.349*	0	0
France	75	2	neg	73	35 (e)	26.0	*19.1*[F1]	*0.2*[F1]	nav	nav
Germany	41	5	neg	36[G1]	38.7	38.2	*37.9*	*0.2*	neg	0.5
Hong Kong SAR	0.151	0.151	nap	nap	0.1	0.1	*nap*	*0.1*	nap	nap
Italy	0.698	0.686	0.001	0.011	11.4	11.4	*11.3*	*0.1*	neg	neg
Japan	1.5[J1]	1.4	nap[C1]	0.1	46.6[J2]	39.7[J2]	*36.1*	*3.6*	nap	6.9[J2]
Netherlands	0.35	0.12[N1]	0.005	0.22	16.09	11.09[N2]	*11.12*	*0.05*	0.001	5.0
Singapore	0.151	0.137	nap	0.014	35.84	3.28	*nav*	*nav*	nap	32.56[S1]
Sweden	0.022	0.017	0	0.005	neg[S2]	neg[S2]	*nap*	*neg*	neg	neg
Switzerland	0.306	0.225	0.064	0.017	4.6	3.7	*nap*[S3]	*nap*[S3]	0.1	0.8
United Kingdom	0.097 (e)	0.077 (e)	0.002	0.018	2.33	2.33[U1]	*2.15*[U2]	*0.18*	neg	neg
United States	8.6[U3]	8.5	nap	0.1	13.7[U4]	13.6[U4]	*12.1*[U5]	*1.5*	nap	0.1

Note: Domestic currency payment accounts. For an explanation of the footnotes, refer to the end of the table.

Table A3 (cont)

Accounts held at the central bank: number and value

Position at end-2000

Key:

nap	not applicable
nav	not available
neg	negligible
(e)	estimate

General notes:

#	Includes intra-European Union remote access. Excludes central banks and IFIs.

Country-specific notes:

[C1] Apart from CLS Bank, which has an account [F1] Reserve period December 2000 to January 2001 (hence the sum is different from the end-year total figure of 26.0). [G1] Includes employees 30.5, public authorities 2.1, others 3.4. [J1] An institution can hold a number of accounts at the BOJ; branches of a financial institution can hold accounts at each of the BOJ branches. [J2] Average outstanding for March 2000. Figures for 'held by banks locally' are for financial institutions subject to reserve requirements (ie banks except certain cooperative banks). The figure for "other" is for institutions not subject to reserve requirements (which includes certain cooperative banks). [N1] Sum of settlement and reserve accounts, as for banks reserve accounts perform both functions. [N2] Different from the sum of required and free reserves because calculated as the average over the reserve period 24 December 2000 to 23 January 2001, instead of being an end-of-year figure. [S1] The government holds two accounts with the MAS for settlement purposes. [S2] The accounts are levelled out or close to zero at the end of the day. (Actual figures were SEK 108 million for banks and SEK 159 million for others - hence the figure of 40% shown in Table 2 in the main text.) [S3] Banks have to meet liquidity requirements, but this can be held in the form of vault cash, balances at the Postfinance or balances at the central bank. Therefore the distinction between required reserves and free reserves is not meaningful. [U1] This figure refers to the total value of funds held by banks in accounts at the Bank of England, including payment accounts and "cash ratio deposits" (see next footnote) [U2] Refers to "cash ratio deposits" (equivalent to USD 2.15 billion at end-2000), which are not held in settlement accounts but are nonetheless eligible as collateral to obtain credit on settlement accounts. [U3] The total number of settlement accounts with the capability of initiating a transfer. [U4] Balances of depository institutions held at Federal Reserve Banks, calculated as the 14-day average of daily required reserves and excess reserves less applied vault cash, plus weekly average required clearing balances. Reported for the last biweekly period of each year. [U5] Includes required clearing balances as well as required reserve balances.

Table B

Overnight and intraday use of central bank money

In billions of USD, daily averages for 2000

	Overnight balance	Peak value of intraday credit
Belgium	0.47[1]	3.47
Canada	0.520	nap[2]
France	35 (e)[3]	26.24
Germany	38.7[3]	nav
Hong Kong SAR	0.1	5
Italy	11.4	6.1
Japan	52.3[4]	112.7[4]
Netherlands	14.63	10.12
Singapore	43.49	nap[5]
Sweden	neg	7
Switzerland	2.0	1.2
United Kingdom	2.19[6]	48[7]
United States	13.7	86.9

Key:

nap	not applicable
nav	not available
neg	negligible
(e)	estimate

[1] Average for January to June 2002. [2] The Bank of Canada provides intraday credit in the form of a fully collateralised guarantee against net debit positions arising in Tranche 1 of the LVTS system. [3] End-2000. [4] Average for 2001. [5] See footnote S1 to Table A2. [6] Payment accounts and cash ratio deposits (see Table A3). [7] Average for September to November 2002.

Table C

Interbank payment systems and arrangements: settlement method, tiering and concentration

Situation at end-2002 (except where indicated)

Country and system	Main type of transactions handled	Volume in 2000 (thousands)	Value in 2000 (USD billions)	Does central bank operate the system?	Settlement method[1]	Number of direct participants	Degree of tiering		Concentration[4]	
							By number of institutions[2]	By value of transactions[3]	By volume	By value
Belgium										
ELLIPS	large-value	2,360	19,775	yes	C1	17[B1]	high[B1]	low (e)	82%	86%
CEC	retail	885,220	451	yes	C1	33[B1]	high[B1]	low (e)	74%	73%
CH of Belgium	retail	4,190	97	yes	C1	39[B1]	high[B1]	low (e)	72%	72%
Euroclear Bank	securities	> 15,000	80,857	no	P6/C2	1,750	nap[B2]	nap[B2]	nav	nav
NBB SSS	securities	115	2,207	yes	C1	151	nav	nav	nav	68%
BXS-CIK[B3]	securities	248	71	no	C1	113	nav	nav	64%	70%
Canada										
LVTS	large-value	3,500	17,532	no	C1	13	high	nav	84%	82%
ACSS	retail	4,152,000	3,599	no	C1	11	high	nav	81%	84%
CDS debt clearing	securities	1,560	14,408	no	C2	9	high	nav	90% (e)	90% (e)
CDS securities	securities	41,500	1,697	no	P5[C1]	9	high	nav	90% (e)	90% (e)
Eurosystem										
TARGET[E1]	large-value	47,980	263,415	yes	C1	1,560	high	mixed (g)	nav	30% (e)
EURO1	large-value	24,692	46,107	no	C2	73	strong	mixed (g)	nav	nav
France										
TBF	large-value	3,000	63,420	yes	C1	170	mixed	mixed (g)	46%	56%
PNS	large-value	5,500	20,327	no	C1	21	strong	mixed (g)	60%	56%
SIT	retail	6,485,300	2,228	no	C1	17	strong	mixed (g)	nav	nav
Clearing houses	cheques	3,453,900	1,758	partly[F1]	C1	200	mixed	mixed (g)	nav	nav
RGV/Relit	securities	41,000	33,856	no	C1	335	mixed	mixed (g)	nav	nav
Clearnet	securities	89,000	1,121	no	C1	59	high	nav	nav	nav

Note: Selected payment systems and arrangements (including payment arrangements associated with securities settlement - in these cases, the volume/value figures are for the related payments not the securities transfers). For an explanation of the footnotes, refer to the end of the table.

Table C (cont)

Interbank payment systems: settlement method, tiering and concentration

Situation at end-2002 (except where indicated)

Country and system	Main type of transactions handled	Volume in 2000 (thousands)	Value in 2000 (USD billions)	Does central bank operate the system?	Settlement method[1]	Number of direct participants	Degree of tiering		Concentration[4]	
							By number of institutions[2]	By value of transactions[3]	By volume	By value
Germany										
RTGS[plus G1]	large-value	nap[G1]	nap[G1]	yes	C1	74	strong[G2]	nav	nav	nav
ELS[G3]	large-value	18,840	25,794	yes	C1	2,486	low	nav	nav	nav
RPS	retail	2,226,600	2,413	yes	C1	2,486	low	nav	nav	nav
AZV	cross-border	185	134	yes	C1	303	strong	nav	nav	nav
MASSE	cross-border	4944	2	yes	C1	136[G4]	strong	nav	nav	nav
Bilateral Interbank[G5]	retail	nav	nav	no	C1	nav	nav	nav	nav	nav
Giro networks[G6]	retail	nav	nav	no	C1[G7]	nav	nav	nav	nav	nav
Clearstream Frankfurt	securities	nav	nav	yes	C1	circa 320	high	nav	nav	nav
Derivatives Clearing	margin payments	nav	nav	yes	C1	nav	nav	nav	nav	nav
Hong Kong SAR										
HKD RTGS	large-value (HKD)	199,114	13,556	no	C1	130[H1]	none	none	nav	48%
USD RTGS	large-value (USD)	186	246	no	P5[H2]	64	mixed	nav	nav	69%
Euro RTGS	large-value (EUR)	nap[H3]	nap[H3]	no	P5[H4]	21	mixed	nav[H3]	nav[H3]	nav[H3]
Italy										
BI-REL	large-value	11,600	39,654	yes	C1	698	low	low (e)	36%	39%
BI-COMP local clrng	paper-based	109,400	779	yes	C2	140	high	high (e)	28%	23%
BI-COMP retail	paperless	1,005,400	1,664	no[I1]	C2	211	high	high (e)	26%	26%
LDT	securities	44,210	28,768	yes	C2	284	mixed	mixed	nav	nav
Express	securities	neg	77	no	C1	71	low	low	91%	78%

Note: Selected payments systems and arrangements (including payment arrangements associated with securities settlement - in these cases, the volume/value figures are for the related payments not the securities transfers). For an explanation of the footnotes, refer to the end of the table.

Table C (cont)

Interbank payment systems: settlement method, tiering and concentration

Situation at end-2002 (except where indicated)

Country and system	Main type of transactions handled	Volume in 2000 (thousands)	Value in 2000 (USD billions)	Does central bank operate the system?	Settlement method[1]	Number of direct participants	Degree of tiering		Concentration[4]	
							By number of institutions[2]	By value of transactions[3]	By volume	By value
Japan[J1]										
BOJ-NET, *of which:*	large-value	5,046	156,640	yes	C1	383[J2]	high[J3]	none (g)	18%[J4]	33%[J4]
DVP - JGBs	*securities*	*1,993*	*33,929*			[J5]				
DVP - other bonds	*securities*	*51*	*257*			[J6]				
FXYCS	fx transactions	9,564	56,587	no	C2	40	strong	low (g)	65%[J4]	61%[J4]
Zengin system	retail	1,220,032	20,113	no	C2	154	high	low (g)	40%[J4]	56%[J4]
TCH - BCCS	bills and cheques	71,559	5,247	no	C2	121	high	nav	47%[J4]	69%[J4]
CD/ATMs[J7]	ATM cash	404,569	191	no	C2/P5[J8]	1,914[J9]	mixed	none (g)	nav	nav
Netherlands										
TOP	large-value	4,000	17,974	yes	C1	105	low	low	73%	72%
Interpay	retail	2,328,400	1,457	no	C1	71	none	none	93%	92%
ClearnetAmsterdam	securities	12,279	560	no	C1	25	high	nav	nav	nav
ClearnetAmsterdam	derivatives	55,540	66	no	C1	12	high	nav	nav	nav
Necigef	securities	3,760	984	no	C1	44	high	nav	nav	nav
Singapore										
MEPS	large-value[S1]	1,908	5,535	yes	C1	72	mixed	nav	55%[S2]	49%[S3]
SGD cheque clearing	large-value/retail	91,259	261	no	C1	33	mixed	nav	nav	nav
USD cheque clearing	large-value	390	12	no	P6[S4]	28	high	nav	nav	nav
Interbank GIRO	retail	29,980	42	no	C1	23	high	nav	nav	nav
EFTPOS	EFTPOS	76,932	3	no	P6[S5]	3	nav	nav	nav	nav
Cash machines/ATMs	cash withdrawals	8,540	1	no	P6[S5]	2	nav	nav	nav	nav
Central depository (CDP)	securities	13,599	99	no	P6[S6]	over 500	nav	nav	nav	nav

Note: Selected payments systems and arrangements (including payment arrangements associated with securities settlement - in these cases, the volume/value figures are for the related payments not the securities transfers). For an explanation of the footnotes, refer to the end of the table.

Table C (cont)

Interbank payment systems: settlement method, tiering and concentration

Situation at end-2002 (except where indicated)

Country and system	Main type of transactions handled	Volume in 2000 (thousands)	Value in 2000 (USD billions)	Does central bank operate the system?	Settlement method[1]	Number of direct participants	Degree of tiering		Concentration[4]	
							By number of institutions[2]	By value of transactions[3]	By volume	By value
Sweden										
K-RIX	large-value (SEK)	510	11,689	yes	C1	22	high	low	90%	90%
E-RIX	large-value (EUR)	62	1,582	yes	C1	18	high	none	99%	99%
VPC	securities	7,700	8,263	no	C2	55	high	mixed	high (g)	high (g)
OM	derivatives	71,700	486	no	C2	63	high	mixed	high (g)	high (g)
BGC	retail	351,410	407	no	C2	20	high	low	85% (e)	90% (e)
Switzerland										
SIC	large-value	149,503	26,444	no[S7]	C1	306	low	low	55%	68%
Secom	securities	14,591	1,564	no	C1	383	low	low	nav	nav
Repo	repos	53	1,849	no	C1	88	none[S8]	none	nav	nav
DTA	credit transfers	389[S9]	134	no	C1	150	low	low	nav	nav
LSV	recurring debits	142[S9]	29	no	C1	150	low	low	nav	nav
ec-Bancomat	cash withdrawals	271[S9]	6	no	C1	133	low	low	nav	nav
ec-DIRECT-EFTPOS	EFTPOS	24[S9]	3	no	C1	134	low	low	nav	nav
ec-DIRECT-Tanken	EFTPOS	16[S9]	neg	no	C1	134	low	low	nav	nav
CASH	e-money	94[S9]	neg	no	C1	132	low	low	nav	nav
ECV	cheques	154[S9]	5	no	C1	153	low	low	nav	nav
United Kingdom										
CHAPS Sterling	large-value (GBP)	21,705	74,464	yes	C1	13	strong	mixed (e)	82%	79%
CHAPS Euro	large-value (EUR)	3,250	38,357	yes	C1	20	high	mixed (e)	72%	84%
BACS	retail electronic	3,316,213	2,912	no	C1	15	strong	mixed (e)	76%	nav
Cheque/Credit clearing	retail paper	2,033,000 (e)	2,202	no	C1	12	strong	mixed (e)	79%	82%

Note: Selected payments systems and arrangements (including payment arrangements associated with securities settlement - in these cases, the volume/value figures are for the related payments not the securities transfers). For an explanation of the footnotes refer to the end of the table.

Table C (cont)

Interbank payment systems: settlement method, tiering and concentration

Situation at end-2002 (except where indicated)

Country and system	Main type of transactions handled	Volume in 2000 (thousands)	Value in 2000 (USD billions)	Does central bank operate the system?	Settlement method[1]	Number of direct participants	Degree of tiering		Concentration[4]	
							By number of institutions[2]	By value of transactions[3]	By volume	By value
United States										
Fedwire	large-value	108,300	379,756	yes	C1	8,592[U1]	mixed	mixed	32%	44%
Fedwire	securities	13,600	188,100	yes	C1	1,249[U1]	mixed	mixed	79%	82%
CHIPS	large-value	59,800	292,147	no	P4	63	strong	mixed	54%	60%
International										
CLS	fx	nap	nap	no	P4	49	nav	nav	nav	nav

Note: Selected payments systems and arrangements (including payment arrangements associated with securities settlement - in these cases, the volume/value figures are for the related payments not the securities transfers). For an explanation of the footnotes refer to the end of the table.

Table C (cont)

Interbank payment systems: settlement method, tiering and concentration

Situation at end-2002 (except where indicated)

Key:

nap	not applicable
nav	not available
neg	negligible
(e)	estimate
(g)	guess

General notes:

[1] Settlement method
C1 = settles in central bank money by the central bank simultaneously debiting/crediting the settlement accounts of the debtors/creditors (either individual payments in real-time in an RTGS system or the net positions periodically in net and other systems).
C2 = settles in central bank money by debtors first paying funds (eg by making an RTGS payment) to a special account at the central bank used solely for this purpose (eg in the name of the settlement agent for the system) and then the settlement agent paying funds from that account to the creditors. (NB Contrast this to P4. In C2, the settlement agent is NOT the settlement institution - the settlement agent does not provide accounts.)
P4 = settles on accounts held by direct participants at a (private sector) settlement institution - but, as a routine part of the normal settlement procedures, the settlement institution defunds those accounts (on the same day) to those with creditor positions using central bank money (eg CLS).
P5 = settles on accounts held by direct participants at the (private sector) settlement institution - and early enough in the RTGS operating day for those with positive balances to defund their accounts on the same day if they want (ie any overnight balances with the settlement institution are voluntary).
P6 = settles on accounts held by direct participants at the (private sector) settlement institution - but sufficiently late in the operating day to prevent those with positive balances at the settlement institution from defunding their accounts on the same day (ie overnight balances with the settlement institution are unavoidable).

[2] Tiering (number of institutions)
None = all or virtually all domestically located banks are direct participants in the system (or exceptions to this are not significant).
Low = at least 75% are direct participants.
Mixed = between 25% and 75% are direct participants.
High = between 5% and 25% are direct participants.
Strong = less than 5% are direct participants.

[3] Tiering (value of payments)
None = all or virtually all payments by value are accounted for by direct participants themselves (rather than by other domestically located banks using these direct participants).
Low = at least 90% of payments by value are accounted for by direct participants.
Mixed = direct participants account for 25-90%.
High = direct participants account for 10-25%.
Strong = less than 10% of payments by value are accounted for by direct participants.

[4] Concentration: percentage of volume/value of payments accounted for by the five largest direct participants in the system.

Table C (cont)

Interbank payment systems: settlement method, tiering and concentration

Situation at end-2002 (except where indicated)

Country-specific notes:

[B1] End-2001. [B2] Not applicable because Euroclear has international membership and the measures of tiering used here are domestically based. [B3] Now Euronext Brussels. [C1] Settlement institution is Bank of Montreal. [E1] Data here refer to the whole TARGET system. (The components of TARGET in CPSS countries are also shown under the relevant country heading.) [F1] Paris clearing house owned and operated by a consortium of banks; other clearing houses owned and operated by the Bank of France. [G1] RTGS^{plus} was launched on 5 November 2001, integrating ELS and EAF into a new system. Hence there are no volume/value figures for 2000. [G2] Strong tiering due to ELS still exists. [G3] ELS is still in operation. Now it is the entry point for banks in RTGS^{plus} as indirect participants via the Bundesbank or other direct participants during a transitional period which will last no longer than three years. [G4] 118 banks and 18 public authorities (Öffentliche Kassen). [G5] Bilateral Interbank Clearing. [G6] Giro networks of the German banking groups. [G7] Intraday settlement is in commercial bank money, but end-of-day balances are generally settled in central bank money. [H1] The direct participants consist of all 129 banks and 1 restricted licence bank (note that due to mergers and acquisitions the number of banks fell from 151 at the end of 2000, shown in Table A3). [H2] Settlement institution is HSBC. [H3] System started operation in April 2003. [H4] Settlement institution is Standard Chartered Bank. [I1] The retail subsystem is managed by the Interbank Company for Automation (SIA) on behalf of the Bank of Italy. [J1] Figures for 2001, except as noted. [J2] Number of online participants. [J3] "High" tiering is due to cooperative banks not having access to accounts at the Bank of Japan. [J4] Figures for concentration are proxies based on data from 2-20 September 2002 (BOJ-NET) and November 2002 (FXYCS, Zengin, TCH-BCCS). [J5] 357 BOJ-NET participants use the DVP facility for JGBs. [J6] 224 BOJ-NET participants use the DVP facility for transactions for corporate bonds and other bonds. [J7] Figures for 10 systems, namely nine systems linking the CD/ATMs of the same type of banking institutions and one system linking these nine systems. [J8] Six systems settle indirectly over BOJ accounts; their net positions are cleared with other payments through the Zengin systems before settlement through BOJ-NET. Four systems settle in their central organisations, and most participants are not able to defund their accounts on the same day. [J9] At end-March 2002. [S1] Also government securities. [S2] Figure is a proxy based on January 2002 data as the payment value for each bank cannot be obtained for 2000. If based on 2000 volume, it should be 52.26%. [S3] Figure is a proxy based on January 2002 data as the payment value for each bank cannot be obtained for 2000. [S4] Settlement institution is Citibank. [S5] Settlement institution is DBS. [S6] Settlement institutions are banks selected by the Singapore Exchange. [S7] SIC AG provides operation on behalf of the SNB. [S8] "None" is shown because only the 88 direct participants take part in the repo market (other banks in Switzerland do not take part). [S9] Only interbank payments (settled on gross bilateral basis). [U1] Number of depository institutions that used Fedwire in 2000. Other Fedwire participants, not included in this figure, are: the US Treasury and any entity specifically authorised by federal statute to use the Reserve Banks as fiscal agents or depositories; entities designated by the Secretary of the Treasury; foreign central banks, foreign monetary authorities, foreign governments and certain international organisations.

Annex 4
Banknotes

Issue of banknotes

Although historically not the case, these days banknotes are usually issued only by the central bank. This is broadly the case in all CPSS economies, except Hong Kong SAR, where banknotes are issued by three commercial banks.[51] Singapore and the United Kingdom are more limited exceptions. Singapore dollar banknotes have been issued by the Board of Currency Commissioners, a government agency, although following the merger of the Board into the MAS in October 2002 this is no longer the case. In the United Kingdom, Scottish banks retain the right to issue banknotes alongside those of the Bank of England and three banks currently still do so.[52]

In this annex we look at banknotes but not at the other form of cash, namely coins. In CPSS countries, coins are not issued by the central bank except in Sweden and, since October 2002, in Singapore following the MAS-BCCS merger just mentioned. Coins are therefore usually not central bank money, and thus for simplicity of exposition are not explicitly covered here. However, because coins share so many features of banknotes - being physical, bearer instruments issued by a public body, having legal tender status, and being universally available for making small value payments - they raise many of the same issues.

Key features of banknotes

Banknotes have a number of features that are relevant in a comparison with central bank deposit money. In certain conditions, safety can be an important consideration. In terms of credit risk, banknotes are effectively a risk-free asset, just like central bank deposit money. Although in normal circumstances this may not be a critical factor - not least because deposit insurance typically covers a large portion of the deposit money balances that consumers hold - it can rapidly become important in times of banking instability.

But unlike central bank deposit money (with the limited exception of Switzerland), banknotes have the added feature of ***legal tender*** status. Although legal tender status is of limited direct relevance in the majority of transactions, it nevertheless helps to build the reputation of banknotes as being safe and unique assets that perhaps underpin other forms of money. (See Table D, at the end of this annex, for information on legal tender status in CPSS countries.)

However, in another sense, banknotes are less safe than deposit money - because of the risk of physical ***loss or theft***. This can be an important consideration in areas where the crime rate is high. Counterfeiting of notes can also be a problem. On the other hand, certain non-cash payment instruments - particularly credit cards - are also subject to fraudulent use.

Risk of theft adds to the ***cost of distribution and storage*** of banknotes, which is also influenced by the need to move the notes physically around the country, to make sure sufficient notes are available when required, and to store notes safely when they are not being used. These costs affect not just the central banks but also the commercial banks that are increasingly used in many countries to distribute banknotes, as well as retailers, which have to store banknotes securely in their premises and make arrangements for them to be deposited safely at a bank. The increasingly sophisticated measures needed to minimise the risk of counterfeiting also add to the ***cost of production*** of banknotes.

For consumers, the financial ***transaction costs*** of banknotes are typically less than or equal to those of deposit money. Sometimes banks charge for use of ATMs to obtain notes - but even where this is the case it is typically only if a customer uses another bank's machine, or where foreign currency is

[51] The Hongkong and Shanghai Banking Corporation, Bank of China (Hong Kong) and Standard Chartered Bank. These three note-issuing banks are required to provide to the HKMA exact backing for their note issuance. Under the currency board arrangements in place since 1983, this backing is in US dollars at the fixed rate of HKD 7.80 per US dollar.

[52] These private notes, which in practice circulate freely only in Scotland, are backed one-to-one by special deposits held at the Bank of England.

obtained. (Indeed, the terms on which foreign currency notes are obtained mean that using cash abroad can be relatively expensive - although it is easier now than it used to be because of cross-border card arrangements.) However, in most cases cash is obtained free either from banks or in wage packets (although the latter is now substantially less common than it once was). Of course, where cash is obtained from a bank or other financial institution rather than an employer, a customer typically has to have some kind of account, which may incur charges, but that is true also for deposit money. And although custom varies from country to country about whether customers have to pay for non-cash instruments (eg owning a credit card) and for transactions using those instruments, banknotes are always free in this respect.

Banknotes can be ***convenient*** in the sense that they enable a transaction to be completed with finality in a quick and easy manner. In particular, compared to the use of deposit money there is the advantage of not having to seek authorisation. On the other hand, there is the risk of accepting a counterfeit, plus the nuisance of handling change. For consumers it can also be burdensome to obtain cash if the ATM network is not extensive or a visit to a bank teller is required. However, the "cash-back" schemes which operate in some countries have made it easier to obtain cash. (In cash-back schemes, consumers use, for example, a debit card in a shop both to pay for their purchases and at the same time receive cash from the retailer; this saves the consumer from making a separate transaction at an ATM to obtain cash and reduces the amount of cash the retailer has to hold and deposit at the bank.)

In some cases immediate finality can be a disadvantage for the consumer. Although the practice is frowned upon by banks, and indeed is illegal in some countries, consumers sometimes take advantage of the time taken to process instruments such as cheques to spend funds they have not yet received - in effect obtaining informal short-term ***credit***, a tactic which cannot be used with cash. Against that, it might at first sight seem to be a disadvantage that banknotes cannot be tied to a formal line of credit in the same way that, say, a credit card can. But provided a customer is given an overdraft on his/her account, this can be used as easily to draw cash as to make a non-cash payment. Overall, then, credit is probably not a significant factor.

The use of banknotes is also ***anonymous***, which can be a legitimate advantage in terms of greater privacy, while of course from a public policy point of view also being a disadvantage by making it easier to conceal illegal trading, tax evasion and money laundering.

Developments in use of banknotes and coins

Banknotes and coins are primarily used for making relatively small-value face-to-face payments. For the very smallest payments, cash is virtually the only payment method used (e-money, although a potential competitor, so far plays only a minor role).[53] But as the amounts get larger, cash (and particularly banknotes, with their larger denominations) competes with other instruments such as debit and credit cards and cheques.

The charts below measure the stock of cash in CPSS countries as a percentage of GDP and of narrow money respectively.[54]

- In most countries the stock of cash is equivalent to between about 3% of GDP (for Canada, France and the United Kingdom) and 8% of GDP (for Switzerland). Japan has become something of an outlier, with the stock climbing from around 10% to 12% in recent years (mostly due to a significant increase in cash, rather than the decline in GDP).
- Measured as a percentage of narrow money, there is more variation between countries. Cash accounts for between about 5% of narrow money (in the United Kingdom) and almost 50% (in the United States).

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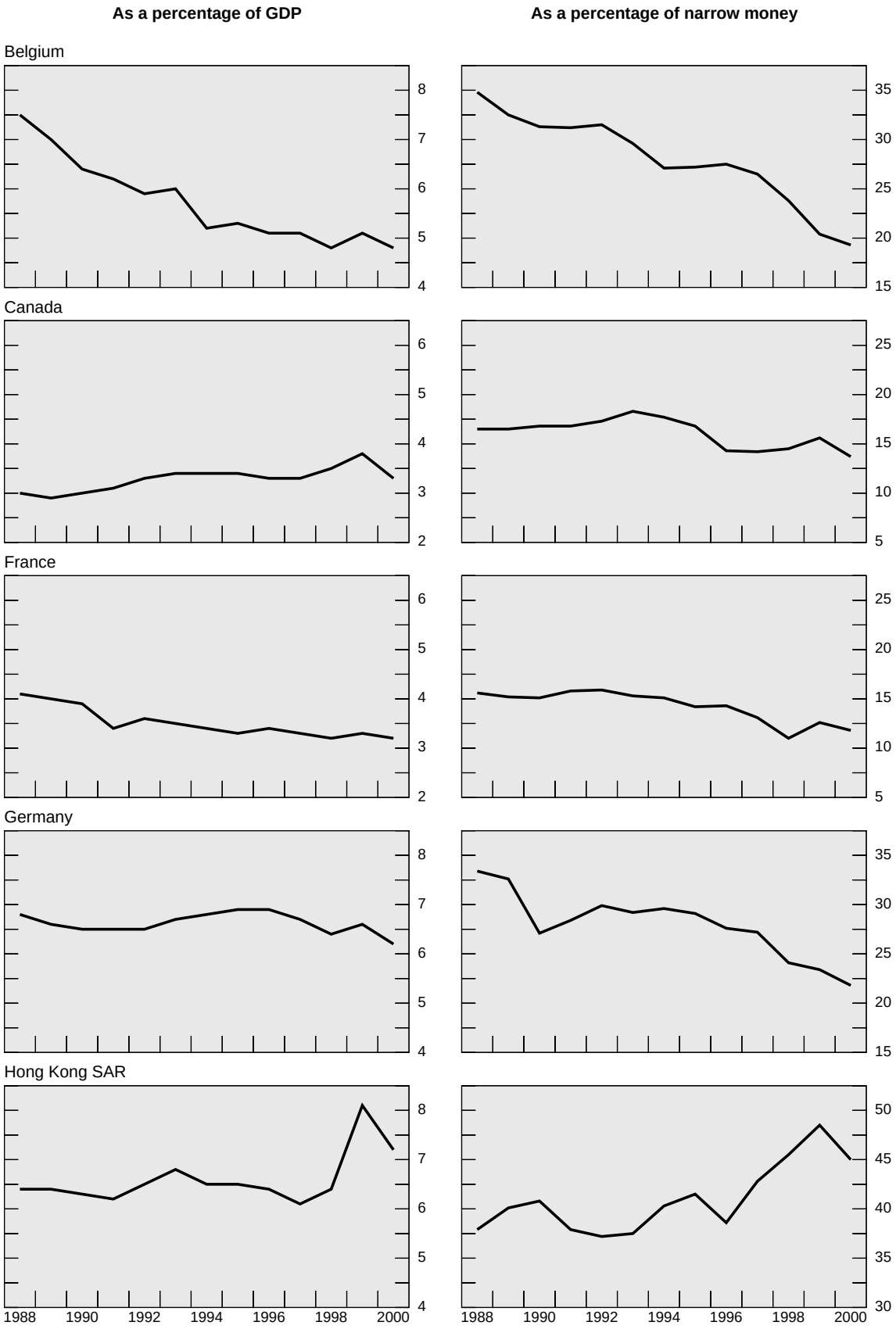
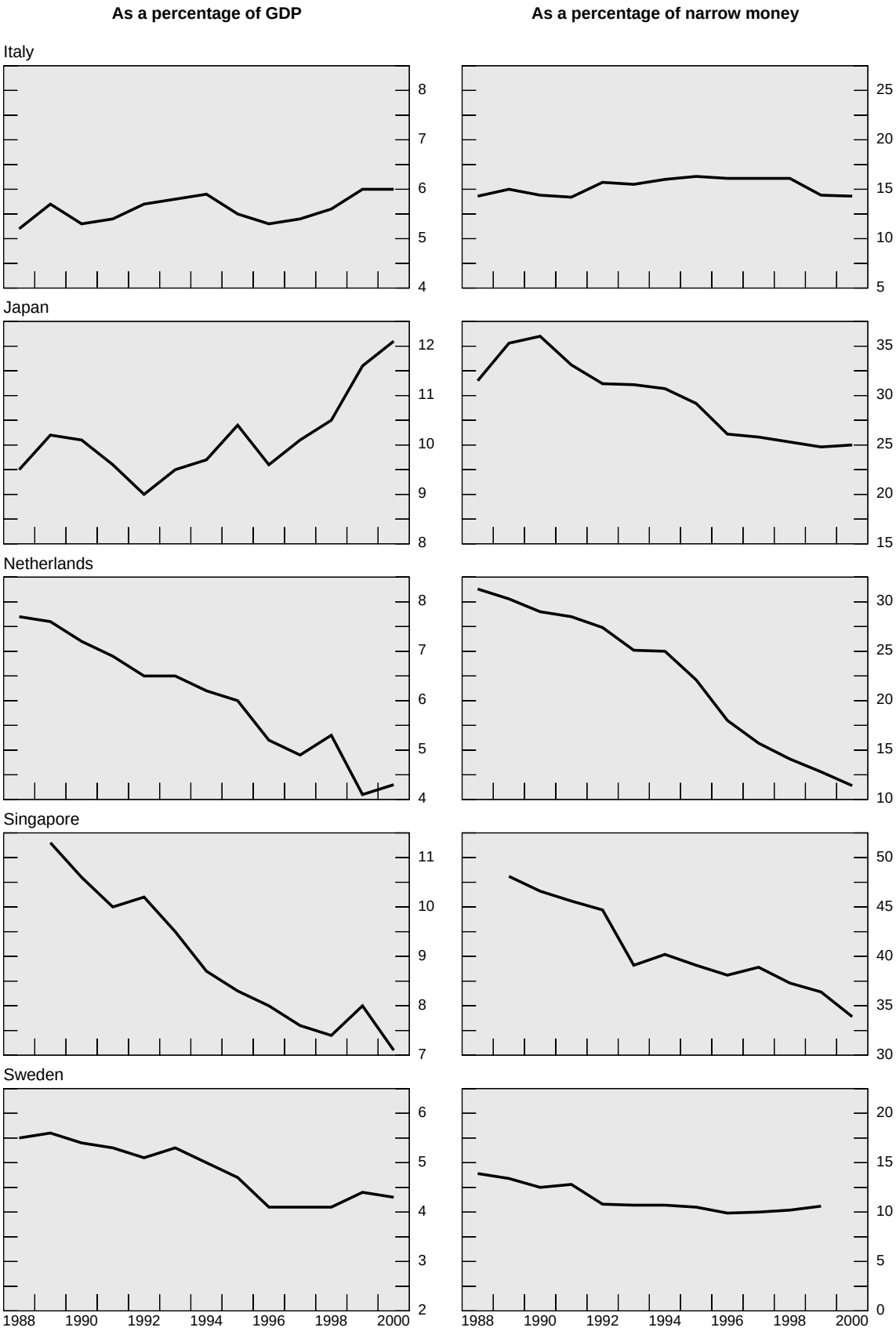
[53] The development of e-money schemes is described in the latest *Survey of electronic money developments*, BIS, November 2001.

[54] Data are taken from the "red book statistics" (*Statistics on payment systems in the Group of Ten countries*, BIS, 1993 to 2000, and *Statistics on payment and settlement systems in selected countries*, BIS, 2001) and, for data for Hong Kong SAR and Singapore before 1996, from the websites of the HKMA, the Hong Kong SAR Census and Statistics Department, the MAS and the Singapore Department of Statistics.

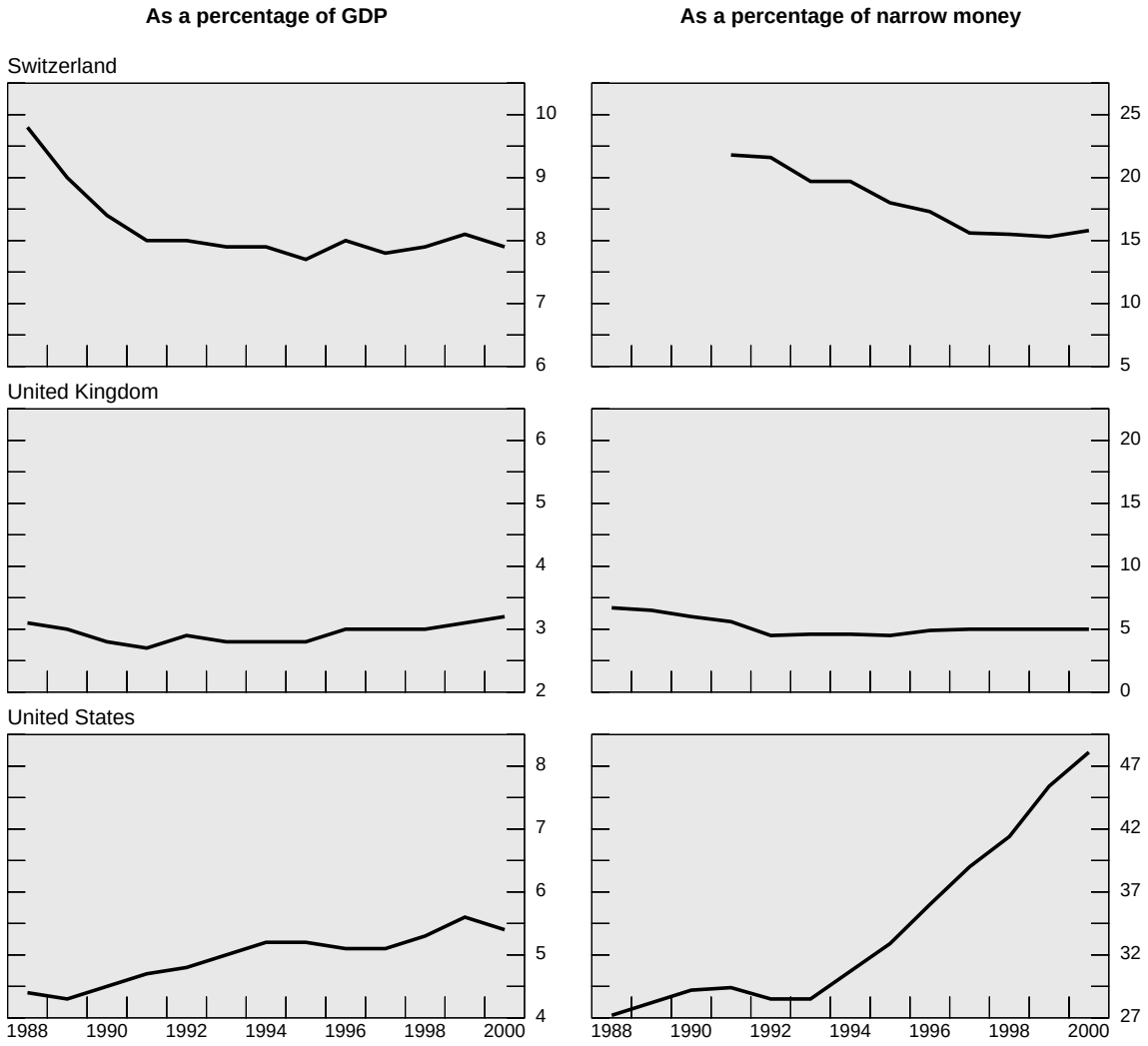
Cash in circulation



Cash in circulation



Cash in circulation



A shift from cash to alternative instruments such as debit and credit cards has long been forecast. The more recent introduction of e-money, which has features specifically designed to make it a direct alternative to cash for small payments, has strengthened some people's belief in such forecasts.

It can be argued that, between them, these alternatives to cash have enough of the advantages of cash, with fewer of the disadvantages, to become a practical substitute. Thus credit and debit cards do not require prepayment, are relatively safe from loss or misuse (from the consumer's point of view, albeit not the issuer's), easy to carry and relatively easy to use. E-money does require prepayment and is less safe but is easier than other cards to use (no need for a personal identification number or to wait for authorisation), is practical for small amounts, and in principle can also be used anonymously and for person-to-person payments.

On the other hand, while debit and credit card use has increased, this has been a slow development in many cases and the growth of e-money has been even slower. At the same time, evidence for a decline in the use of cash is mixed.

In terms of *stocks*, the charts above show a generally clear if usually modest downward trend for cash in seven of the 13 CPSS countries (Belgium, France, Germany, the Netherlands, Singapore, Sweden and Switzerland). In contrast, there is a clear upward trend in only one country, the United States, where the increase is particularly marked in terms of narrow money (from less than 30% to almost 50% over 12 years). This reflects both an absolute increase in the stock of cash, partly driven by non-domestic demand, and an absolute decline in transferable deposits, driven in particular by the use of retail sweep accounts, which distort the data.[55] Against broader measures of the money stock, which are not distorted by the sweep accounts, the share of cash has increased only slightly. In the remaining five countries, the trend is less clear cut. However, looking at the absolute stocks of cash in these five countries, in four of them (Hong Kong SAR, Italy, Japan and the United Kingdom) there has been a steady increase, at least in most years, while in Canada there have been decreases as well as increases.

In terms of *number of transactions*, what little evidence there is shows a decline in cash usage.

- In the United Kingdom, surveys suggest that cash payment volumes fell from around 86% of all transactions in 1984 to 74% in 1999 (a downward trend that is forecast to continue, largely as a result of the full automation of state benefit payments from 2005, with cash payments expected to account for only 62% of the total by 2010).
- In Germany the cash ratio of all retail payments decreased from 79% in 1995 to 69% in 2001.

Of course, as with all payment methods there tends to be substantial inertia - in the absence of a significant shock such as a banking crisis or of substantial cost differences, consumers are typically slow to adopt different methods. Thus, even though other payment instruments can hardly be said to have replaced cash so far, this does not mean that in due course they will not become dominant.

The central bank as issuer of e-money

As suggested above, e-money is a possible substitute for cash. This is particularly true of so-called "open loop" schemes that allow transfers of electronic balances directly from one consumer to another without any involvement of a third party such as the issuer of the balance. (Most existing schemes, in contrast, only allow payments from consumers to merchants and are in this sense less flexible than cash.[56]) The potential substitutability of e-money for cash might lead central banks to consider issuing e-money themselves. This would raise various issues. In particular, central banks would want to consider carefully the possible implications for competition, innovation and privacy. At the moment, no CPSS central bank intends to issue e-money to the general public, although some have explicitly left this option open for the future.

[55] In a retail sweep programme, a depository institution sweeps amounts above a predetermined maximum level from a depositor's checking account into a special purpose money market deposit account (MMDA) created for the depositor. If the balance in the checking account falls below some minimum level, funds are moved from the MMDA back into the checking account to bring the checking account balance to the specified minimum level.

[56] For more information on types of e-money schemes, see *Implications for central banks of the development of electronic money*, BIS, 1996.

Table D

Legal tender status in CPSS countries

Belgium (euro area)	
Status	There is no explicit statutory or case law definition. Belgian doctrine is that legal tender is money that has the capacity to legally and therefore validly discharge pecuniary debts. Unless a valid agreement exists between parties on the acceptance of certain means of payment, legal tender constitutes a valid payment means. (The validity of such an agreement is to be assessed within the framework of general contract law.)
Applies to	(See euro area below.) Banknotes issued by Eurosystem central banks. Coins issued by euro area governments.
Limits	(See euro area below.) Banknotes: unrestricted. Coins: restricted to 50 coins per transaction. (However, the National Bank of Belgium and the Post Office are bound to accept coins without limitation.)
Other	*Limits and regulations in specific legislation*: (a) merchants are obliged to accept payment by cheque or credit transfer for amounts exceeding EUR 248; (b) employees must accept salaries paid by deposit money if a collective agreement allows for this; and (c) the King has the power to decide conditions for paying the state income (taxes, remuneration, etc) by means of credit transfer. *Penalties*: refusal to accept genuine and undamaged coins at their face value can be punished with a fine of EUR 25 to EUR 75.
Canada	
Status	According to the Currency Act, a tender of payment of money to discharge a debt is valid if it is made in legal tender (as indicated below). However, the form of a payment can be whatever is mutually acceptable to the parties in a transaction, and this is a matter of private agreement between those parties. No one is legally obliged to accept cash in payments.
Applies to	Banknotes issued by the Bank of Canada. Coins issued by the government.
Limits	Banknotes: unrestricted. Coins have limits: CAD 40 if the denomination of the coins used is between CAD 2 and CAD 10 (inclusive). (However, note that currently the CAD 2 coin is the highest existing denomination.) CAD 25 if the denomination is CAD 1. CAD 10 if the denomination is 10 cents or greater but less than CAD 1. CAD 5 if the denomination is 5 cents. 25 cents if the denomination is 1 cent.
Other	–
Euro area - general	
Status	EU law does not contain an explicit definition of legal tender but a common aspect in all euro area countries is that it has the legal effect that it is incumbent on the creditor to accept legal tender banknotes and coins as valid discharge of pecuniary debts unless the parties have agreed to use an alternative means of payment.
Applies to	Banknotes issued by the ECB and the national central banks of the participating member states. Coins issued by participating member states.
Limits	Banknotes: unrestricted. Coins: restricted to no more than 50 coins for a payment, except for the issuing authorities and other designated persons.
Other	–

Table D (cont)

Legal tender status in CPSS countries

France (euro area)	
Status	Under French law legal tender is defined as the obligation of economic agents, in particular retailers, to accept banknotes and coins designated as legal tender according to their recognised value.
Applies to	(See euro area above.) Banknotes issued by Eurosystem central banks. Coins issued by euro area member states.
Limits	(See euro area above.) Banknotes: unrestricted. Coins: it is not compulsory to accept a payment composed of more than 50 coins. (This does not apply to payments to the French treasury.) But see also "other" below.
Other	*Specific legislation:* when the value of a payment exceeds a certain level for specific transactions which are defined in law (in order to prevent tax evasion), the use of banknotes and coins to make a payment is prohibited (which means that the beneficiary should not accept payment by that means). For example: cash payments by merchants cannot exceed EUR 750 and those by individuals cannot exceed EUR 3,000. *Penalties:* refusal to accept banknotes or coins having legal tender status is subject to penal fines.
Germany (euro area)	
Status	No explicit definition. Parties are free to agree to accept other means of payment. Unless other means of payment were agreed explicitly, refusal to accept legal tender could be seen as an (unjustified) delay in accepting payment.
Applies to	(See euro area above.) Banknotes issued by Eurosystem central banks. Coins issued by euro area member states.
Limits	(See euro area above.) Banknotes are legal tender for any amount. Coins: no one is obliged to accept German euro commemorative coins of an amount more than EUR 100 in a single payment. If a single payment is made in euro coins (or in a mixture of euro coins and German commemorative coins), no one is obliged to accept more than 50 coins even if this is less than EUR 100. But there is unrestricted acceptance by federal government cash offices and the Deutsche Bundesbank.
Other	In practice, there are some fields where cash is replaced by deposit money by law (eg citizens are usually required to make their payments to the competent tax authority by cashless payment). Cashless payments obliged by law can also increasingly be found in other fields (eg contributions to the capital of a public limited company, payments of salary or pension of civil servants, some other payments from public authorities). Refusal to accept legal tender could be seen as an (unjustified) delay in accepting payment.
Hong Kong SAR	
Status	The parties to a transaction are free to set the terms of payment. However, where they have not contracted to pay in a specific form, payment by legal tender will validly discharge the debt.
Applies to	Banknotes issued by the Hongkong and Shanghai Banking Corporation, Standard Chartered Bank, and Bank of China (Hong Kong). Coins and the new HKD 10 notes issued by the Hong Kong SAR government.
Limits	Banknotes: legal tender for any amount. Coins: denominations of not less than HKD 1 for payment of an amount not exceeding HKD 100. Denominations of less than HKD 1 only for an amount not exceeding HKD 2.
Other	–

Table D (cont)

Legal tender status in CPSS countries

Italy (euro area)	
Status	Unless a valid contract exists between parties specifying an alternative means of payment, legal tender constitutes a valid means of discharging a debt.
Applies to	(See euro area above.) Banknotes issued by Eurosystem central banks. Coins issued by euro area member states.
Limits	(See euro area above.) Banknotes: unrestricted.
	Coins: restricted to no more than 50 coins for a payment (but unrestricted acceptance by issuing authorities).
	except that anti-money laundering law prohibits any direct cash transfer above EUR 12,500, except in the case of transfers between authorised intermediaries (eg banks).
Other	A creditor who refuses to accept banknotes and coins with legal tender status can be punished if the refusal is unjustified.
Japan	
Status	Legal tender is lawfully acceptable for payment of pecuniary debts, public charges and taxes. It applies to all pecuniary debts except where an alternative means of payment is specified in the contract.
Applies to	Banknotes issued by the Bank of Japan. Coins issued by the government.
Limits	Banknotes: no limit.
	Coins: maximum of 20 coins of the same denomination can be used as legal tender.
Other	–
Netherlands (euro area)	
Status	There is no explicit definition. According to Dutch law, money used to settle a claim should be "passable or accepted currency". In practice, the status of legal tender does not mean that acceptance by the creditor is compulsory, as the creditor can contractually agree to accept other means of payment. Exceptions can also ensue from law, custom or reasonableness and fairness. (For example, the law specifies that payment through a banking system is a valid means of discharge of a monetary debt unless the creditor has validly excluded this method of payment.)
Applies to	(See euro area above.) Banknotes issued by Eurosystem central banks. Coins issued by euro area member states. "Relief money" (hulpgeld) like tokens, stamps and coins under exceptional circumstances.
Limits	(See euro area above.) Banknotes are legal tender up to any amount.
	Coins: restricted to no more than 50 coins for a payment, except for the issuing authorities.
Other	Ministries are required by law to promote payments to the state by way of bank transfers, and they have to discourage the use of credit cards, cash payments and cheques for the discharge of these debts.
Singapore	
Status	The parties to a transaction are free to choose the form of payment. However, the Currency Act makes it clear that in the absence of any agreed terms between the contracting parties, legal tender will be accepted as the means to fulfil a payment obligation or debt. Parties cannot rely on implied terms or established customs to contract out; written notice (eg the putting-up of signs by a shopkeeper requiring non-cash payment) is required. Nevertheless, there is nothing to stop contracting parties, even in the absence of any written notice, to subsequently agree on other forms of payment.

Table D (cont)

Legal tender status in CPSS countries

Singapore (cont)	
Applies to	Banknotes and coins issued by the MAS. (Notes and coins were previously issued by the Board of Commissioners of Currency, Singapore (BCCS) but the BCCS merged with the MAS in October 2002.)
Limits	Banknotes: unlimited.
	Coins: In the case of coins of a denomination exceeding 50 cents: for the payment of any amount. In the case of coins of a denomination of 50 cents: for the payment of an amount not exceeding SGD 10. In the case of coins of a denomination lower than 50 cents: for the payment of an amount not exceeding SGD 2.
Other	–
Sweden	
Status	Unless a valid contract exists between parties specifying an alternative means of payment, legal tender constitutes a valid means of discharging a debt.
Applies to	Banknotes and coins issued by the Riksbank.
Limits	Banknotes and coins can always be used for payment; but it is likely that this right can be waived in a contract.
Other	There is no known example of a court case in which the issue of legal tender has been tested. The Riksbank's legal experts presume that a refusal to accept notes and coins as payment would be upheld by the court if the payer, in a contract, has waived his right to use notes and coins as a means of payment.
Switzerland	
Status	The definition of legal tender is governed by the Federal Law on Currency and Payment Instruments of 22 December 1999. Moreover, Article 84 of the Code of Obligations states that monetary obligations have to be paid by legal tender. However, this applies only if the parties to an agreement have not explicitly agreed on any other means of payment.
Applies to	Coins issued by the Confederation. Banknotes issued by the Swiss National Bank. Swiss franc sight deposits at the Swiss National Bank.
Limits	Coins: limited to 100 coins in circulation, except for Swiss National Bank and the public cash offices of the Confederation (unlimited acceptance of coins).
	Banknotes without limitation.
	Swiss franc sight deposits at the Swiss National Bank must be accepted without any limits by any person holding an account there.
Other	–
United Kingdom	
Status	Parties to a transaction can explicitly or implicitly agree that payment should be made in a specified manner. However, a creditor who refuses to accept legal tender notes (in circumstances where payment by legal tender notes has not been excluded by the parties) will not be able to sue for recovery provided that the debtor has deposited the sum claimed into court.
Applies to	Banknotes issued by the Bank of England. Coins issued by the government.
Limits	Banknotes: unrestricted.
	Coins are limited to a specified amount: coins of cupro-nickel or silver of denominations of not more than 10 pence are legal tender for payment of any amount not exceeding GBP 5.

Table D (cont)

Legal tender status in CPSS countries

United Kingdom (cont)	
Other	The above is applicable in the United Kingdom except in Scotland (the concept of legal tender does not exist in Scottish law).
United States	
Status	Under federal statutory law, "United States coins and currency ... are legal tender for all debts, public charges, taxes, and dues." Legal tender applies to all debts, whether or not a contract provides that the debt is to be paid by some other means.
Applies to	Coins and currency issued by the United States.
Limits	None.
Other	Although what constitutes "legal tender" is defined by federal statute, the consequences of such a designation (eg the consequences of tendering legal tender) are not specified by statute, nor is any remedy or penalty for failure to accept legal tender specified by statute.

Annex 5
Members of the CPSS

This report was produced by the Committee on Payment and Settlement Systems, whose members are listed below.

Chairman (European Central Bank)	Tommaso Padoa-Schioppa
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Bank of Canada	Clyde Goodlet Sean O'Connor
European Central Bank	Jean-Michel Godeffroy Ignacio Terol
Bank of France	Yvon Lucas Denis Beau Jacqueline Lacoste
Deutsche Bundesbank	Hans-Jürgen Friederich Wolfgang Michalik
Hong Kong Monetary Authority	Tony Latter (until December 2002) Norman T L Chan (from January 2003) James H Lau Jr Esmond K Y Lee
Bank of Italy	Carlo Tresoldi Stefano Carcascio
Bank of Japan	Tadashi Nunami Shuhei Aoki
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Annex 6
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