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THE CONTRIBUTION OF PAYMENT SYSTEMS TO FINANCIAL STABILITY

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Foreword

The Committee on Payment and Settlement Systems (CPSS) of the G10 central bank governors held its meeting in May 2000 in Mexico City. Since the Committee wanted to use this opportunity to establish and renew contacts with central banks in Latin America and the Caribbean, it organised a workshop before its meeting. It was only the second meeting of the Committee outside Basel, following the May 1999 meeting in Hong Kong SAR. At that time a workshop took place with the central banks from Asia and the Pacific.[1]

The aim of the workshop was to enhance the exchange of information and cooperation on all issues relating to payment and settlement systems between, on the one hand, the central banks of Latin America and the Caribbean and, on the other hand, between them and the central banks and monetary authorities represented in the Committee. The workshop, which was widely attended, brought 29 institutions together: members of the Committee[2] plus senior representatives from Aruba, the Bahamas, Bolivia, Brazil, Chile, Colombia, Costa Rica, Cuba, Guatemala, Mexico, Nicaragua, Peru, El Salvador, Trinidad and Tobago, Uruguay and Venezuela.

The workshop covered three broad areas: international standards for payment systems and securities settlement systems, retail payment systems and large-value payments. The presentations made by both G10 and non-G10 central banks clearly underlined the common interest and shared expertise in the area of payment and settlement systems between all participating central banks and the usefulness of continuing central bank cooperation, in particular with respect to ongoing payment systems reform.[3]

Tommaso Padoa-Schioppa,
Chairman, Committee on Payment
and Settlement Systems,
and Member of the Executive Board,
European Central Bank

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1 The proceedings of this workshop were published in December 1999 under the title "Current Topics in Payment and Settlement Systems" and are available on the BIS website (www.bis.org).

2 The G10 central banks (Belgium, Canada, France, Germany, Italy, Japan, the Netherlands, Sweden, Switzerland, the United Kingdom, the United States) plus the monetary authorities from Hong Kong and Singapore as well as the European Central Bank are represented in the CPSS.

3 The proceedings are reproduced as presented at the workshop and have undergone only light editing. The views expressed in them are those of their authors and not necessarily the views of the BIS or the central banks represented.

Introductory remarks

The contribution of payment systems to financial stability
Sergio Ghigliazza García, Director General, CEMLA

It means a great honour for me to have the opportunity of welcoming all of you to CEMLA and it is a pleasure to host this workshop on the contribution of payment systems to financial stability, in collaboration once again with the Bank for International Settlements and the Secretariat of the Committee on Payment and Settlement Systems, which have always represented an active support for CEMLA and the Latin America and Caribbean region.

Financial systems are widely integrated in the international markets, thus, because of the facilities provided by technological advance it is essential to coordinate efforts to achieve an optimum development of the payment systems of the region's countries. Current payment systems emerged and operate based on the technological development of the last 20 years. Nevertheless, efficiency, thus, velocity and certainty of their functioning bear risks capable of disturbing the world economy. They may diffuse a crisis arising in one country to the rest of the world, given the interconnection of the systems and the fact that their regulation and legislation have not advanced as fast as technological innovation. It is because of the implications that disturbances in payment systems may bring to financial and economic stability and the conflicts that could arise between the objectives of financial stability and prices, as well as with the system's operating efficiency, that CEMLA's member central banks have, as a priority task, the purpose of facing the challenges stated by the interdependence of payment systems.

Clearance, payment and settlement systems must have as an objective the optimum balance between security and efficiency, guaranteeing a prompt final settlement. Today, reforms are addressed towards delivery versus payment and payment versus payment. Reforms to our payment systems should seek flexible systems, oriented towards sudden changes in market necessities, and to cover the hended requirements, ie liquidity, in order to facilitate the implementation of monetary policy through payment systems.

Aiming to prevent systemic crises that could arise due to the failure of one or more payment system participants, the Lamfalussy Report was drawn up; more recently the CPSS formulated the Core Principles for Systemically Important Payment Systems and currently is working on the second part of the Principles, which refers to their implementation. Moreover, remarkable advances on the creation of the Core Principles for Securities Settlement Systems have been achieved. The principles are intended to be accurate and precise, and at the time universal, capable of being followed and applied in the particular circumstances of development, resources and necessities of each country.

Given the uncertain consequences that a desequilibrium in the payment systems could imply for the implementation of monetary policy and the repercussions the propagation of a systemic crisis may bring to financial stability, payment systems currently have special importance. For this reason, since 1994, CEMLA has included among its main functions activities on payment systems, offering courses, seminars and meetings on the topic, as well as working side by side with the Bank for International Settlements and the World Bank.

Currently, CEMLA collaborates as Technical Secretariat of the Western Hemisphere Payments and Securities Clearance and Settlement Initiative, which was launched by the World Bank nearly two years ago. Among the most important tasks are: to publish the reports on the payment systems of 10 countries of the region; to maintain an agile, active and up-to-date web page that responds to the necessities of our Associated members; and the consolidation of a specialised Working Group for the region.

At CEMLA, on the other hand, we are elaborating a survey, which will soon be distributed, aiming to obtain a view of the payment systems advances and requirements in our Associated members'

countries. Also, a glossary which is useful to the region was concluded. This glossary was created in collaboration with the World Bank, the Secretariat of the Committee on Payment and Settlement Systems and the International Advisory Council of the Western Hemisphere Clearance and Settlement of Payments and Securities Initiative, and with feedback from the payment systems specialists of Latin America and the Caribbean.

We are very pleased to inform the workshop that the Spanish version of the Bulletin, the reports and the papers elaborated by the functionaries of the Associated member central banks of this Centre for Studies have been published on our web page, supplementing the diverse courses and seminars on payment systems addressed to discuss the risks implied and the plans to face them.

We are working on the creation of solid bases that may sustain the adequate functioning of our payment systems, and significant achievements for the region are being reached which will allow us to meet the expected aims. This, I am sure, will be possible given the intense collaboration between central banks and the solidarity they have shown to jointly face the challenges raised by the world's economic integration and globalisation.

Dr José Sidaoui, Deputy Governor, Bank of Mexico

I am delighted to be here on the opening of this workshop. First of all, I would like to congratulate the Committee on Payment and Settlement Systems (CPSS), the Bank for International Settlements (BIS) and the Center for Latin American Monetary Studies (CEMLA) for organising this workshop, which will examine the subject of payment and securities settlement systems, an issue that is so vital to central banks.

For a long time, the operation of payment systems was not viewed as a subject of primary importance for central banks. However, there have been major changes in the nature and operation of these systems over recent years. One of them has been the rapid growth and integration of financial markets, which has caused the proliferation of the number and volume of transfers that take place through payment systems. In addition, the technological revolution in the fields of information technology and communications has had profound implications in terms of the speed and variety of transactions.

While accelerated growth in payment systems reflects the dynamic performance of the contemporary economy, this evolution nonetheless involves certain risk factors. The bankruptcy of Bankhaus Herstatt in 1974 and the New York Stock Exchange crash of 1987 were among the events that stimulated the study of these risks.

The importance the payment systems have in the functioning of more complex, globally integrated economies has prompted central banks to adopt a more active and coordinated role in promoting the efficiency and sound development of those systems. It is worth emphasising the role that the G10 central bank governors, institutions like the BIS and, at a Latin American level, CEMLA have played in these joint efforts.

Here in Mexico, acknowledging the relevance that the payment systems have for the economy, the 1994 law that granted autonomy to Bank of Mexico also established the promotion of the payment systems' proper functioning as one of the institution's main objectives.

That is why we began calling for an integral reform of the payment and securities settlement systems more than five years ago, and will actively continue to do so in the future, with the aim of making them increasingly swift, safe and efficient, in line with international design and operational standards.

This reform has sought to establish an operating framework that fosters joint responsibility and prudent behaviour among all participants in the payments system and minimises systemic risks. It has also endeavoured to stimulate the system's efficiency and reduce the costs economic players incur when making a payment. Allow me to address these issues in greater detail.

With regard to the establishment of a framework aimed at stimulating prudent operations, prior to 1994 the payment systems' security features focused exclusively on preventing fraudulent transactions and did not consider the financial risks arising from any participant's failure to honour contractual obligations.

Thus, the Bank of Mexico's responsibility regarding the payment systems was determined by operational criteria and this led to an indiscriminate use of central bank financing by credit institutions. Although the financing was paid off at the close of each day, the risk that this would not occur nonetheless existed, thereby weakening the Bank of Mexico's monetary control. Furthermore, this state of affairs failed to encourage appropriate risk management among participants.

That is why, in a gradual fashion that has not affected the system's functioning, we have improved control over the intraday credit that the central bank extends to settle the payment system. We have established limits on the amount of credit granted to each participant and have demanded collateral. This has reduced the "moral hazard" that arises when the central bank guarantees the settlement of transfers and participants expect the institution to absorb the costs of a possible default.

Revamping a system in which the central bank shields participants from all the credit risks and guarantees settlements in the payment systems was not a very popular idea among financial intermediaries. Therefore, one major challenge was persuading the financial community of the need for change. The documents related to the payment systems sponsored by G10 central bank governors, and backed and disseminated by the BIS, were a vital part of this communication and persuasion task. The need for reform was supported by these documents, which conveyed forceful arguments, as well as the prestige of the organisations involved.

Turning to the issue of operational modernisation of the payment systems, a number of studies have shown that an inefficient payment system can indeed be very costly for an economy. Hence the need to promote its functionality and modernisation on a permanent basis.

A payment system that helps economic players carry out their transactions rapidly, safely and cheaply galvanises the economy, leading to concrete benefits for the entire population.

This is why over recent years we have adopted a number of technological improvements and new practices in the Mexican payment system in order to diminish costs and make all types of payments more expeditious and reliable. To date we have achieved major gains at the level of interbank and high-value transactions. Insofar as we manage to extend the use of more efficient and secure payment systems to broader segments of the population, we will be providing economic agents with competitive tools and greater certainty.

Ladies and gentlemen, given its impact on economic stability, on the application of monetary policy and on economic efficiency, the reform of the payment systems must not be a merely operational concern, but must play a leading role in the design of a central bank's policy.

The Bank of Mexico has given high priority to the payment system reforms and has created a group of high-level specialists who also evaluate the impact of the payment system on the goals of the central banks in the context of the entire economy.

In view of increasing economic integration, efforts to reform the payment system cannot be isolated and demand a spirit of cooperation among various organisations and central banks to ensure congruency of actions and policies.

In this sense, in the global sphere, the G10 central bank governors and the BIS have contributed extraordinarily to the analysis of the challenges faced by the payment systems, to the sharing of experiences among different countries, and to the identification of more effective policies and practices. At a regional level, CEMLA has stressed the growing importance of payment systems for better economic performance and has promoted increased interest and knowledge in this field.

The Bank of Mexico fully supports the most recent efforts undertaken under the auspices of the CPSS to identify and reach consensus on best practices for the design and operation of payment and settlement systems.

Our institution also supports workshops such as the one bringing us together today. These events foster the exchange of ideas and contribute to generating diagnoses of and solutions to the common problems we face. Through joint efforts and permanent communication, we will be able to meet the challenges posed by an increasingly interdependent and integrated world economy.

Major issues in relation to payments and settlements
Wendelin Hartmann, Member of the Directorate, Deutsche Bundesbank, Chairman of the CPSS

1. Welcome

This event was conceived as a joint initiative of the secretariats of CPSS and CEMLA under the direction of Gregor Heinrich and Sergio Ghigliazza García to organise a joint workshop on major issues in national and cross-border payment systems. The intention was to facilitate a very broad exchange of technical, organisational and political details of payment systems within the western hemisphere on the one hand and the G10 central banks on the other hand. The initiators were convinced that this would be to the benefit of both sides and would also avoid duplication of efforts on similar objects in the participating countries.

2. Overview of major issues in relation to payments and settlements

Just about two weeks ago, on 3 May, foreign ministers from six Central American countries met in Panama. According to Reuters, they "hailed talks to promote greater regional integration".

Such integration would add to existing groupings such as Mercosur and ALADI. We note a strong drive for integration, even if in practice things may not be so easy.

Just as companies merge or form alliances in order to gain efficiencies and to better face the challenges of an increasingly competitive marketplace, so do entire industries, interest groups and even countries - and all this has cross-border implications.

Cross-border commerce, and also financial market activity, has grown in parallel. Since financial transactions almost invariably involve some form of payment, one product of this market growth has been growth in the values that have to be handled by payment systems - many of which were originally ill-equipped to handle the activity. This has resulted in a substantial increase in risks, both in domestic markets and, even more so, in cross-border transactions involving different currencies.

Payment systems are therefore faced with many risks. The prime concern here - ie from the point of view of regulation - is counterparty risk. That is, credit and liquidity risks arising from the interbank exposures which exist in many payment systems.

More specifically, the concern is with counterparty risk where it is extreme enough to cause systemic risk - namely, the risk that, because of these interbank exposures in payment systems, the failure of one bank participating in a payment system will cause the failure of others. One of many goals is therefore also to protect particular payment systems from disruptions originating from outside the system, regardless of whether those disruptions have a merely national or perhaps also an international cause.

As the issues - and the risk - have become global (and are certainly no longer a merely national affair), the institutions most concerned with risk - such as central banks - are also increasingly recognising the benefits of cooperation. In the CPSS, central banks from the G10 industrialised countries have formally cooperated on payment system matters for over 10 years and, counting predecessor committees, perhaps for about 20 years.

But in line with the increasingly global challenges to financial stability, the central banks [BIS/CPSS] are increasingly building a network that goes beyond merely the G10 countries.

At the outset of this workshop, I would briefly like to highlight the main developments regarding the CPSS:

Global outreach

To encourage the development of sound payment and settlement arrangements around the world, the CPSS has taken a number of steps to involve a wider group of central banks in its work. Since 1997/8 CPSS meetings have also been attended by representatives from the ECB, the Hong Kong Monetary Authority and the Monetary Authority of Singapore. In the various subgroups set up by the Committee to consider specific topics, an even larger number of institutions are represented; this is particularly true of the group developing the core principles, which involves 12 non-G10 central banks (including Bank of Mexico) plus the World Bank and IMF. Other initiatives include support for regional payment groups (such as those in southern Africa and in the Black Sea region), regional high-level meetings organised by the CPSS (including this meeting in Mexico), and support for regional central bank seminars on payment system issues.

Core principles and recommendations

In December the CPSS issued for consultation its draft ***Core principles for systemically important payment systems*** as part of the international effort to increase financial stability by establishing standards or best practices for financial markets. The Committee is currently in the process of finalising these core principles in the light of the comments received during the consultation period and at the same time is working on an accompanying document which will provide guidance on how the core principles can be implemented. We will discuss this effort with the chairman, John Trundle, in a moment.

The CPSS is also working jointly with IOSCO on a set of recommendations for settling securities transactions. As the chairman, Pat Parkinson, will explain, this work is at an earlier stage than the core principles; the two groups aim to have a draft ready for public consultation by the end of this year. We will hear more about this effort later this morning.

Retail payments

Since its creation in 1990, the CPSS has concentrated primarily on issues concerning large-value payment and settlement systems - not least because these are the systems that are potentially the most risky and the most relevant for the operations of financial markets and the implementation of monetary policy. An important exception was the work on electronic money in 1996, and the subsequent continued monitoring of e-money developments by the Committee on behalf of the Governors. Recently the CPSS has begun a more comprehensive review of retail payments. So far this has concentrated on the payment instruments themselves and how they are settled, but the Committee will shortly begin to consider the possible policy implications for central banks.

In Latin America and the Caribbean, as far as I know, retail payment instruments and related payment systems are of particular interest, as electronic processing is increasingly introduced at all levels of the economy. At this meeting we shall have the whole afternoon today to concentrate on these issues. The chairman of the task force, Carlo Tresoldi, will provide details on the G10's study of this subject.

Reducing foreign exchange settlement risk/Large-value payment systems

(a) Since the Governors announced their strategy for tackling foreign exchange settlement risk in 1996, a major development has been the progress made by the private sector in creating a multicurrency "payment-versus-payment" service - the Continuous Linked Settlement Bank (CLSB), an international institution to be based in New York. The CLSB has the potential to effectively eliminate the principal risk and greatly reduce the liquidity risk associated with settling FX transactions. Unfortunately, the launch of this project has been postponed until October 2001. Hence the Governors of the G10 central banks has encouraged the CLS

shareholders only recently to pursue in their efforts to commence operations as soon as possible.

(b) For the time being, and with the important exception of the US dollar and the Canadian dollar, none of the currencies from the countries of the western hemisphere will be settled in CLSB. But it is of interest to note that participation in this largest private sector risk reduction initiative requires well functioning national RTGS systems.

RTGS systems - or systems with similar characteristics to RTGS systems - are particularly important. Partly because they come as close to eliminating payment system risk as you can get. And partly because they are an important platform for other system improvements - namely in connection with settling financial market transactions and monetary policy activity by central banks.

Therefore, we will dedicate the third module of our meeting, tomorrow morning, entirely to matters of common interest with regard to "large-value" payment systems.

3. Conclusion

We have called this meeting a "workshop" - but the term may not be quite precise. Rather, this is the first meeting in which central bank payment system experts and policymakers from North and South America, the Caribbean as well as from Europe and Asia have the opportunity to exchange experiences, to learn from each other and to continue to build a strong and useful network.

Presentations and discussions

Module 1: Core Principles - International standards for payment systems and securities settlement systems

(a) Payment systems

The CPSS core principles for systemically important payment systems[4]
John Trundle, Head, Market Infrastructure Division, Bank of England, Chairman CPSS Task Force on Core Principles

Robust financial infrastructure can help contain systemic risk. Payment systems are at the core of financial infrastructure and they need to be designed and operated in ways which ensure their safety as well as their efficiency. This article looks at an international initiative to provide a universal framework for analysing these issues by establishing core principles for systemically important payment systems. It suggests they reflect a wide consensus and can be used to promote payment system reform throughout the world.

The initiative is led by an international task force of payment system experts who are establishing the principles that are common to payment system assessment and reform exercises around the world. The work includes looking at counterparty credit risk issues - which were discussed for both payment and securities settlement systems in an article in the previous edition of the Financial Stability Review (Hills, Rule (1999)) - but goes broader than that by considering also other financial risks; legal and operational risks; and questions of efficiency, access and governance.

The first part of this article reviews the objectives of the initiative; the second looks at the first results of the task force's work, published in a consultative document in December 1999, including the principles themselves and the thinking behind them; and the third looks at the responsibilities of central banks. The report discusses the key role of central banks in applying the core principles and overseeing payment systems. The article describes also the continuing work of the task force - to elaborate on ways in which the principles can be implemented in different national circumstances. The exercise will be successful only if the principles are used widely in practice, and the article concludes that there are encouraging early signs of this happening, even before the task force's final report has been published.

The task force on payment system principles and practices

Financial structure requirements

The crises of the second half of the nineties in Asia and South America revealed serious flaws not only in macroeconomic management, but also in the structure and regulation of financial markets in both debtor and creditor countries. This brought about international policy responses in a number of areas - which were discussed in an article in the June 1999 Financial Stability Review (Drage, Mann (1999)). In 1997 an ad hoc working party on financial stability in emerging market economies was set up in response to an initiative taken at the June 1996 summit of G7 heads of state and government in

[4] This presentation is based on an article written by David Sawyer and John Trundle, Market Infrastructure Division, Bank of England, published in the Bank of England's Financial Stability Review, June 2000. The article can be accessed on the Bank of England's website at http://www.bankofengland.co.uk/fsr/.

Lyon which included representatives of countries in the Group of Ten and of emerging market economies. It set out a strategy for fostering financial stability in countries experiencing rapid economic growth and undergoing substantial changes in their financial system (BIS (1997c)). A major component of this strategy was the development through a broad international consensus of sound principles and practices in areas which were key to maintaining and promoting robust financial systems. One such area where no broad international consensus existed was the design and operation of payment systems.

Demand from emerging markets

At the same time, the increasing volumes traded in financial markets and the rising values of payments stemming from them were leading many countries to reassess their payment systems and, in many instances, to plan major programmes of reform or development. Emerging market countries in particular were seeking advice on how this should be done. One particular group of countries seeking advice were those in the former Soviet bloc. In many cases, the initial payment arrangements introduced immediately after the dismantling of the previous government-owned monobanking systems were extremely inefficient and unreliable, and unable to support adequately the banking sector reforms under way. Advice was also being sought by countries in southern Africa, Southeast Asia and Latin America. In all these countries progress in payment system reform was being hindered by the absence of a consistent and widely accepted set of guidelines in this area.

Establishing the task force

Central banks have played a prominent role over the past decade or so in worldwide initiatives to improve understanding and standards in payment and settlement systems. In particular the G10 central banks have published analytical studies and have developed guidelines, norms and strategies to improve particular clearing, payment netting and settlement arrangements.[5]

In response both to the 1997 report of the working party on financial stability in emerging market economies and to the demand from emerging market countries, the G10 central banks' Committee on Payment and Settlement Systems (CPSS) decided in May 1998 to establish a Task Force on Payment System Principles and Practices (the 'task force') to develop an overall framework of core principles for the design, operation and oversight of payment and settlement systems for all countries. The principles would represent an international consensus, but would not seek to impose a single model. As with other internationally agreed codes and standards, they would recognise that economies and institutional arrangements vary. In order to find a wide consensus, the group includes, in addition to representatives from the G10 central banks and the European Central Bank, representatives from eleven other national central banks of countries from different regions of the world and in different stages of economic and financial sector development and also representatives from the International Monetary Fund (IMF) and the World Bank (see full list in Annex). The involvement of the IMF also helped ensure the sharing of ideas with those working on the IMF's Code of Good Practices on Transparency in Monetary and Financial Policies (IMF (1999)).

The first part of the task force's report was published by the Bank for International Settlements (BIS) for public consultation in December 1999 (BIS (1999)). Work is continuing on a second part, which discusses in more detail how the principles can be interpreted and applied in different contexts. The final report is expected to be published by the BIS in the second half of 2000.

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[5] These include studies of Interbank Netting Schemes (BIS (1990)); Delivery versus Payment (BIS (1992)); Cross-border Securities Settlements (BIS (1995)); Foreign Exchange Settlement Risk (BIS (1996) (1998a)); RTGS systems (BIS (1997a)); Exchange-traded Derivatives (BIS (1997b)); and Over-the-counter Derivatives (BIS (1998b)).

Systemically important payment systems

The focus of the task force's report is on principles for payment systems, that is systems that provide for the transfer of funds between financial institutions on their own behalf or on behalf of their customers. The principles may also provide help in evaluating the design and operation of systems involving the settlement of transactions in other financial assets, such as securities, in particular because they often include a system for transferring funds. Securities settlement systems as a whole, however, raise additional financial stability issues in their own right. The CPSS and the International Organisation of Securities Commissions (IOSCO) have therefore established a separate working group to study the specific issues involved in securities settlement. The two groups are working closely together and have some common members including the central bank chairmen of each group.

The task force also agreed from the outset that stronger principles should apply to the most important payment systems. It concluded that to produce principles that necessarily applied to every payment system regardless of its size and impact would result in a watering down of the principles. The report therefore is aimed specifically at the most important payment systems, which it refers to as "systemically important payment systems". These are systems which can trigger or transmit shocks across domestic and international financial systems and markets, for example because of the size or nature of the payments which they process, or because of the aggregate value of the payments. A large-value payment system used to settle transactions in wholesale financial markets, for example the Clearing House Automated Payments System (CHAPS) in the United Kingdom, would fall into this category. It is not only large value systems, however, which may be systemically important. Some retail systems which carry predominantly lower-value payment transfers may also involve larger-value transfers. The notion of a systemically important payment system was developed to make all designers, operators and overseers of payment systems ask themselves whether their particular system, if insufficiently protected from risk, could transmit systemic disturbances. This inevitably involves an element of judgement but the task force thought it best to make explicit the need for that judgement. Part 2 of the report provides further guidance on identifying such systems. The important factor is that the system includes a significant number of payments of high individual value, not necessarily to the exclusion of lower-value payments. It is envisaged that each country has at least one such system.

The report acknowledges that the principles may also be useful in assessing and understanding the characteristics of systems which pose relatively little systemic risk, and that it may be desirable for such systems to comply with some or all of the principles, for instance those relating to operational reliability and efficiency.

The objectives of the core principles: safety and efficiency

By their nature, systemically important payment systems are an essential mechanism supporting the effectiveness of financial markets. The stability of the financial system depends in part on the safety of such systems. If the systems are to be used they also need to be efficient - it is of no use having a very safe system if most large value transactions occur elsewhere. Safety and efficiency are often complementary as improvements in design or operating techniques can deliver more of both, but there are occasions when there may be a trade-off to be made. The core principles explicitly recognise the possibility of such a trade-off by including a principle (VIII) on efficiency.

The report states that safety and efficiency should be objectives of public policy. Individual participants also have an interest in safety and efficiency and market forces will often support these objectives. But some of the costs and risks of payments systems are not borne by those who create them, for example, the costs of the insolvency of a participant may be borne by other participants, not necessarily in a predictable way, or participants may wrongly assume that the public authorities such as the central bank would support the system in the event of a failure. Such externalities and problems of coordination between participants mean that systems may not of themselves achieve adequate levels of safety or efficiency. Public policy therefore needs to address the objectives. The core principles for

the design and operation of systemically important payment systems and the report's recommendations for applying them have been developed to help realise these objectives.[6]

The audience for the principles

The principles are intended for use as universal guidelines to encourage the design and operation of safer and more efficient systems worldwide. They are therefore aimed at designers, operators, overseers and users of payment systems. A primary audience, however, is central banks because of their leading role in payment systems, both as overseers and, in many countries, as operators and also as providers of the ultimate settlement asset - claims on a central bank. Central banks in emerging market countries may find the principles of particular use because of the efforts in train in many such countries to improve systems or to build new ones. The principles may also be of use to those offering technical advice and assistance in these areas. One area of application is the joint Financial Sector Assessment Program (FSAP) embarked on last year by the IMF and the World Bank. Its primary focus is the assessment of financial sector vulnerabilities and the identification of development priorities. The process includes an assessment of progress in implementing those financial sector standards which are thought to be key to stability in a particular country (IMF (2000)). The core principles have already been used by the IMF in country assessment and by the World Bank in its technical assistance programme.

Updating and broadening the reference of the Lamfalussy Standards

The task force has drawn extensively on previous work of the CPSS and others in compiling its report, but its prime model has been the Report to the G10 Governors of the Committee on Interbank Netting Schemes, published in 1990, more commonly known as the Lamfalussy Report. This has been very influential. It analysed issues relating to cross-border and multicurrency netting arrangements, established minimum standards and some more general goals for the design and operation of such schemes, and also suggested principles for their cooperative oversight by central banks.

The Lamfalussy standards were designed for a very specific category of systems that were being proposed in the late 1980s and especially for those designed to reduce risks and increase efficiency in the settlement of foreign exchange transactions. They have since been applied well outside their original context, to payment, clearing and settlement systems of many types such as domestic netting systems and automated clearing houses. Part of the task force's brief was to review the Lamfalussy standards and consider whether and how they could be adapted to a broader scope, covering all systemically important payment systems. Six of the task force's ten principles (I, II, III, V, VII, and IX) represent the Lamfalussy standards either in their original form or with some modification. Like the Lamfalussy standards, the core principles also include minimum standards (in Principles IV and V) to apply in all applications of the principles, but with a clear indication that best practice is for these to be exceeded. New principles, not inherited from Lamfalussy, are concerned with efficiency, prompt settlement, the credit risk associated with settlement assets, and governance.

The management of risk

The core principles reflect the Lamfalussy Report's primary concern with the management of risk. Payment systems can be subject to many risks:

- Credit risk: the risk that a party within the system will be unable fully to meet its financial obligations within the system currently or at any time in the future.

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[6] Safety and efficiency are not the only public policy objectives relating to payment systems. Other objectives, such as crime prevention, competition policy and consumer protection can play a role, but these issues are outside the scope of the task force's report.

- Liquidity risk: the risk that a party within the system will have insufficient funds to meet financial obligations within the system as and when expected, although it may be able to do so at some time in the future.
- Legal risk: the risk that a poor legal framework or legal uncertainties will cause or exacerbate credit or liquidity risks.
- Operational risk: the risk that operational factors such as technical malfunctions or operational mistakes will cause or exacerbate credit or liquidity risks.

All of these types of risk, whether in isolation or in conjunction with each other, can have systemic consequences: that is the inability of one of the participants to meet its obligations, or a disruption in the system itself, could result in the inability of other system participants or of financial institutions in other parts of the financial system to meet their obligations as they become due. Such a failure could cause widespread liquidity or credit problems and, as a result, could threaten the stability of the system or of financial markets.

The core principles (see Box 1)

The first core principle is concerned with minimising legal risk. Payment systems should be legally robust - the rules and procedures of a system should be enforceable - and participants should be certain as far as possible of the legal consequences of using them, in particular where the system involves cross-border elements such as foreign bank participation or the use of multiple currencies and where there may be material legal risks stemming from several jurisdictions. There may be specific statutes or case law relating to payment systems which would be relevant. Other aspects of the legal environment in the relevant jurisdictions - for example contract, banking and insolvency law - could also have a crucial bearing on whether the rules and procedures of the system are enforceable. The implementation of this principle can involve substantial amounts of work by specialists and most countries can improve the legal robustness of their payment infrastructure. For example in the United Kingdom the implementation of the Settlement Finality Directive has made more certain that British and European courts would enforce a designated system's rules in the event of the insolvency of a participant.

The concern behind Core Principle II is that system operators and participants should understand clearly the financial (credit and liquidity) risks in the system and where they are borne. The rules and procedures of the system are the main instruments for defining and explaining these risks. Core Principle III takes this one step further: the system's rules and procedures should also define clearly how the credit and liquidity risks can be managed and where the responsibilities for this lie. All parties should have both the incentives and capabilities to manage and contain these risks, and if credit exposures can be produced by participants before final settlement is effected (eg in a netting system), limits should be placed on the maximum level of these credit exposures.

Although a payment system's rules and procedures may ensure that participants are able to understand, manage and contain the risks that they bear, this may still be insufficient if these risks are exacerbated by the length of time the system takes to settle - for example if the exposure extends overnight - or if the asset that participants obtain in final settlement itself carries material risks. The fourth and sixth principles (new principles in this report) state that all systemically important payment systems should, once payments are accepted for settlement by the system (ie when all relevant risk management tests have been satisfied), provide prompt settlement, at a minimum on the day of value, and that settlement should occur preferably in central bank money. Principle VI states that where a settlement asset other than a claim on a central bank is used it should carry little or no credit risk. The task force's latest thinking is that account should also be taken of whether such an asset brings significant liquidity risk to the system and its participants.

Most countries should aim to have at least one payment system which exceeds the minimum standard of the fourth principle for prompt settlement, ideally by providing real-time final settlement during the day as has already been achieved in many countries.

Core Principle V also draws from the Lamfalussy Report, and like Core Principle IV contains a minimum standard. In contrast to the other principles however, which are applicable to all types of systemically important payment system, it applies only to systems involving multilateral net settlement. This will typically involve the deferral of settlement in the system. In such a system it must be possible, for example by using collateral, to complete the day's settlements even if the largest single debtor to the system fails. The task force adds that best practice has moved on since the Lamfalussy Report; systems that satisfy only this minimum standard are still exposed to the financial

Box 1

The core principles for systemically important payment systems

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

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

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

IV.[1] The system should provide prompt and final settlement on the day of value, preferably during the day and at a minimum at the end of the day.

V.[1] A system in which multilateral netting takes place should, at a minimum, be capable of ensuring the timely completion of daily settlements in the event of an inability to settle by the participant with the largest single settlement obligation.

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

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

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

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

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

[1] Systems should seek to exceed the minima included in these two principles.

Source: Consultative Document (BIS (1999)).

risks of the failure of more than one institution during the same business day. Best international practice now is for multilateral netting systems to be able to withstand the default of more participants than the one with the largest single obligation. It is possible to eliminate this credit risk though a different design of the system, such as RTGS. Hybrid designs[7] may also be able to achieve similar effects. RTGS or hybrid designs are seen increasingly as the best way to reduce or eliminate settlement risk.

Operational risk is addressed in Core Principle VII, and to most market participants this is perhaps the most "obvious" requirement for a payment system. A systemically important payment system should have standards of security appropriate to the transaction values involved and should maintain a high degree of operational resilience. The precise standards which meet this test will change over time,

[7] Such hybrid designs include the Canadian Large Value Transfer System, a net settlement system with a central bank guarantee; the German EAF2, a bilateral matching system; the French PNS; and the planned new form of the US Clearing House Interbank Payment System (CHIPS) with intraday finality, which is expected to be implemented in January 2001.

sometimes - as at present - rapidly, in response to changes in the market for payment services (such as increased demand), and also to technological developments which enable safer, faster, or more efficient processing. Wherever possible a payment system should be designed and operated according to standards or recommendations which have been agreed at an international, national or industry level. Operational resilience, however, means not just reliable technology and adequate back-up of all hardware and software, but also effective business procedures and competent personnel who can operate the system efficiently and safely, and ensure that the correct procedures, including risk management procedures, are followed.

Core Principle VIII (another new principle) addresses specifically the objective of efficiency. While the earlier principles have concentrated on minimising risk for users and hence maximising the safety of the system, this principle acknowledges that a system needs to be efficient and that any trade-off between safety and efficiency has to be recognised explicitly. Little would be gained if a payment system were to be designed with such extensive safety features that it became too slow or expensive to use. System designers will therefore need to consider how to provide the quality and the features demanded by users at minimum resource cost, given the need to meet the core principles limiting risk in the system. The report discusses these concepts in greater detail, and sets out an analytical framework for system design. This should encompass the identification of efficiency requirements; the evaluation of costs (social and private, including not just those that are passed on to participants directly through system charges but also indirect costs, such as cost of liquidity and collateral); the identification of resources (social or private); the determination of technological and infrastructure constraints; and the definition of the safety constraints imposed by the core principles.

Core Principle IX extends another of the Lamfalussy standards to all systemically important payment systems. Access criteria that encourage competition amongst participants promote efficient and low-cost payment services. There may be a need to protect the system and its participants from direct participation in the system by institutions that would expose them to excessive risks, but any restrictions on access should be objective, and based on reasonable risk criteria.

The final principle (Core Principle X) deals with systems' governance arrangements. Because a systemically important payment system has the potential to affect the wider financial and economic community, its governance should be effective, accountable and transparent, whether the system is owned and operated by the central bank or the private sector. The report gives some guidance as to what this will mean in practice. A system which complies with this core principle is likely to have a high-level decision-making process which is prompt and communicates clearly to system users. Major decisions are likely to be made only after consultation with all interested parties. Governance arrangements will probably include external elements, independent of those managing the system's operation, with an overall responsibility for the system's functioning and strategy.

Interpretation and implementation issues

The second part of the task force's report is currently being prepared. It provides more details of the issues to be addressed and gives examples of ways of implementing each core principle. It offers guidance, for example, to a central bank on deciding which payment systems are systemically important. It provides some general advice on how the task of payment system review and reform might be approached and carried through. A wide range of structural, technical and institutional factors will need to be considered. Banks, other financial institutions which participate in payment systems and user groups should normally be closely involved in the design choices and in defining user specifications. The active cooperation of some institutions not directly involved in payment systems may also be required; for instance compliance with Principle I could require the involvement of government and the legislature to establish a legal framework that would be more supportive of the payment systems by making the impact of insolvency law more predictable or by ensuring consistency between payment system rules and insolvency law.

This second part of the report also discusses the effect of different payment system designs and organisational features on the implementation of the core principles. For example, Principle V by definition does not apply to RTGS systems but applies to deferred net settlement systems and possibly

to some hybrid systems, whereas Principle IV would apply to all three types of system. Part 2 of the report also looks more closely at the different forms of credit and liquidity risks that can arise in deferred net settlement systems and RTGS systems, and how these can be addressed and controlled - this is particularly relevant to the implementation of Principle III - and at the different types of additional financial resources that can be used by net settlement systems to satisfy Principle V. There is also a discussion of the very specific difficulties in satisfying some of the principles raised by a system that handles paper-based debit instruments such as cheques.

The role of central banks

While a variety of different public sector agencies may have an interest in payment system issues, central banks have a key role to play in overseeing safety and efficiency because of their responsibilities for financial stability, their role in providing settlement accounts for payment system participants, and their responsibilities for the implementation of monetary policy and maintaining confidence in the domestic currency. The expertise they have developed in pursuing these functions gives central banks a particular leading role in respect of systemically important payment systems. This is recognised in the four specific responsibilities of central banks in ensuring that systems comply with the core principles (see Box 2).

In most countries the central bank is itself the operator of at least one systemically important payment system. Compliance with many of the core principles - for example, those dealing with risk controls - is directly under the central bank's control in those instances. The central bank can take whatever actions are necessary to ensure that the systems it operates comply with the principles.

Where a system is not operated by the central bank, it should oversee compliance with the core principles. Oversight procedures can vary between central banks and the responsibilities for applying the core principles are intended to encompass different practices so that they can be applied in a variety of circumstances. A central bank's oversight, however, should always have a sound basis. There may be a variety of means by which this can be achieved. Some countries have a statute-based system of oversight with specific tasks and responsibilities assigned to the central bank and sometimes also to other agencies. Others rely more on custom and practice. Either type of approach can work. Current practices vary widely but are also changing fast. Changes in the institutional structure of payment system oversight have recently been implemented in a number of countries, for example in Australia and Italy. Canada too has given the central bank responsibility to designate and oversee systems of systemic importance. While the detail of the changes varies, there is a trend to more formality and the report suggests that countries newly establishing or significantly revising the oversight role should at least consider a statute-based approach.

Box 2

Responsibilities of the central bank in applying the core principles

A.	The central bank should define clearly its payment system objectives and should disclose publicly its role and major policies with respect to systemically important payment systems.
B.	The central bank should ensure that the systems it operates comply with the core principles.
C.	The central bank should oversee compliance with the core principles by systems it does not operate and it should have the ability to carry out its oversight.
D.	The central bank, in promoting payment system safety and efficiency through the core principles, should cooperate with other central banks and with any other relevant domestic or foreign authorities.

Whatever the basis of oversight, all interested parties - including designers and operators of payment systems and participants in the systems - need to have a clear understanding of the central bank's objectives. This requirement, set out in Responsibility A, parallels the transparency requirements of the IMF Code of Good Practices on Transparency in Monetary and Financial Policies (IMF (1999)). Such understanding, based on disclosure by the central bank, will allow all parties to operate in a

predictable environment. There are various means by which clear definition and disclosure can be achieved. Where oversight is statutory, the relevant legislation may well provide a framework for disclosure. Central banks' traditional areas of responsibility, such as monetary policy, are generally set out clearly in the legislation under which they are established or in related legislation which gives them particular responsibilities, powers and forms of accountability; in a number of cases, this is also true of the central bank's role in payment systems. Legislation cannot, however, deal with all eventualities and a central bank should also disclose publicly the major policies it will follow in relation to systemically important payment systems. Such disclosure is in any case desirable on its own merits though means of disclosure vary quite widely. They can include, for example, an informal approach, such as speeches by senior officials, or more formal means such announcements, notices or papers in official publications. Many countries may also use public consultation before some detailed aspects of the central bank's policies are finalised; this helps to build support for these policies and to avoid unintended effects on the private sector or payment system participants.

The central bank may not be the only authority interested in the safety and efficient functioning of payment systems. The ministry of finance, banking regulators, legislative and competition authorities are amongst those who most frequently also have an interest. The oversight of payment systems, the surveillance of financial markets and the regulation of financial institutions are complementary activities. A central bank should cooperate with these authorities, and where relevant with other central banks and foreign authorities, in promoting the safety and efficiency of systemically important payment systems. Cooperation and information exchange is particularly important for systems with cross-border or multicurrency characteristics (the principles for cooperative central bank oversight set out in Part D of the Lamfalussy Report provide a framework for such cooperation). European Union central banks for example, under the auspices of the European Central Bank, cooperate to oversee the European Banking Association's Euro 1 system. These same central banks also cooperated by agreeing in 1993 collective minimum common features for payment systems (EEC (1993)). In addition they established arrangements with banking supervisors for the exchange of relevant information.

Conclusion

The consensus within the task force on the principles seems to be shared widely throughout the world. This unanimity makes the principles a potentially powerful tool because it is difficult for any one country to ignore an agreed world standard. For that reason consultation has been wide and detailed. The task force or some of its members has consulted with other groups of central banks in Africa, the Americas, Asia, the Pacific rim and Europe. Those consulted have said they find it helpful to have consensual guidelines codified and explained in this way. But the ultimate test of success will be whether they are used in practice throughout the world in the way that the Lamfalussy standards have been used for the design of multilateral netting systems.

Early signs are encouraging. Several of the countries which are candidates for accession to the EU are using the draft report when upgrading their payment systems - in Bulgaria, for instance, the National Bank, together with the National Council on Payment Systems, is in the process of building the core principles into the regulations that will govern the RTGS system. Work being undertaken by the Southern Africa Development Community (SADC) to develop a strategic framework for payment system modernisation is drawing on the core principles. Elsewhere, current work on the Western Hemisphere Payments, Clearance and Settlement Initiative (WHI) by the World Bank and the Inter-American Development Bank (IDB), which aims to improve payments and securities clearance and settlement systems in Latin America and the Caribbean, has also made increasing use of the core principles. In addition several countries have carried out assessments of their payments infrastructure against the core principles and, as noted above, the IMF is beginning to use them in its Financial Sector Assessment Programme.

As the volumes and values being transferred through payments systems around the world continue to grow, the robustness of this part of the financial infrastructure becomes more important. Both developed countries and emerging market economies should assess all their systemically important

payment systems against the core principles and, where necessary, make changes or implement programmes of structural reform in a transparent way to ensure compliance with the core principles.

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Regional cooperation: the EMEAP experience

Tomoyuki Shimoda, Chief Assistant Manager, Bank of Japan

Thank you for the opportunity today to share with you the experience of cooperative activities in the East Asia and Pacific region called EMEAP.

What is EMEAP? EMEAP stands for the Executives' Meeting of East Asia-Pacific Central Banks.

It is a cooperative organisation of central banks and monetary authorities in the East Asia and Pacific region. Its primary objective is to strengthen the cooperation among its members.

EMEAP members. EMEAP comprises the central banks and monetary authorities of 11 economies, namely Australia, China, Hong Kong, Indonesia, Japan, South Korea, Malaysia, New Zealand, the Philippines, Singapore and Thailand.

It is interesting to see that five of the 11 members use English as an official language; more so than the G10 countries.

EMEAP members represent a wide variety of culture and economies and that is why we consider EMEAP activities to be an important opportunity to exchange views and learn from one another.

History. EMEAP's evolution to date can be divided into two phases. The first phase is from its establishment in 1991 to 1996. This first period saw the nurturing of relationships among members through Deputies' Meetings held twice a year. Deputies discussed issues concerning economic and financial developments in the region.

The first six years helped to foster closer cooperation and mutual understanding among members and paved the way for the further development of EMEAP in the second phase.

Given the increasing interdependence of member economies, EMEAP activities were strengthened in 1996. The first Governors' Meeting was held in July that year and the governors decided to establish two Working Groups and one Study Group to undertake studies on the primary functions of central banks. The Working Groups focused on financial market development and central banking operations, and the Study Group dealt with issues of banking supervision.

In 1998, the structure of the Working Groups was reorganised into three Working Groups as each Working Group and Study Group had made significant progress in each area.

Governors' Meeting. Currently, the framework for EMEAP activities is divided into three: Governors' Meeting, Deputies' Meeting and Working Groups.

The Governors' Meeting is the highest decision-making body of the EMEAP. It determines the basic policies of EMEAP activities.

The Governors' Meeting is held once a year.

Governors also exchange ideas and information on recent economic and financial developments in the region. In order to make the discussion more focused, discussion topics are set for each meeting.

Deputies' Meeting. The Deputies' Meeting is held twice a year and attended by Executive Directors of member central banks and monetary authorities.

Given that the Governors' Meeting is held only once a year, the Deputies' Meeting plays an important role in ensuring the continuity of EMEAP activities. The Meeting also monitors the activities of the three Working Groups and determines the direction of their work.

Working Groups. The three Working Groups are those on payment systems, financial markets and banking supervision.

The WG on Payment and Settlement Systems studies developments in domestic and cross-border payment and settlement systems.

The WG on Financial Markets studies central bank services and developments in the FX market, money market and bond market.

The WG on Banking Supervision studies issues in banking supervision that are of interest to central banks. In recent years, bank supervision authority was separated from central banks to other supervisory agencies in some EMEAP economies. The WG is therefore made up of representatives not only from central banks but also from the supervisory agencies.

EMEAP Confidential Network. The EMEAP Confidential Network launched in July 1998 connects all EMEAP members via an electronic network. It allows swift exchange of information among members. As there is no permanent secretariat service in place at the EMEAP, the Network functions as "Virtual Secretariat".

The Network was especially useful during the Y2K changeover period for sharing information on the Y2K status of each EMEAP economy among members and brought about close cooperation to address the common challenge.

EMEAP Seminars. EMEAP has held various seminars on subjects of topical interest from time to time.

In 1996 and 1997, seminars on payment and settlement systems were hosted jointly with the BIS. In 1998 and 1999, the seminar took up the Year 2000 problem and each member institution's experience was shared among members. E-money and issues related to securities settlement were also covered in the seminars.

EMEAP Review. The EMEAP Review contains speeches by senior officials of member central banks and monetary authorities, and papers and documents issued by member institutions.

The Review is published quarterly and available on the EMEAP website.

EMEAP Red Book. The so-called "EMEAP Red Book" was published in November 1997. Compared with the CPSS Red Book, the EMEAP Red Book covers a broader area of financial issues, containing detailed information on the structure of financial markets such as the FX market, money market, bond and stock markets as well as payment and settlement systems in each EMEAP economy.

Working Group on Payment and Settlement Systems. Here, I will focus on the activities of the Working Group on Payment and Settlement Systems.

The chairman of the WG is Tadashi Nunami of the Bank of Japan, succeeding Yoshiharu Oritani of the Bank of Japan.

The primary objective of the WG set out in its Terms of Reference is to exchange information, share experience and undertake analysis on developments in domestic and cross-border payment and settlement systems.

To carry out its mandate, the WG has set out a more detailed Work Plan of its activities for the first two years. The work plan is to study FX settlement risk reduction measures, and to analyse the structure of national payment and settlement systems in the EMEAP economies.

FX Settlement Risk. Tackling FX settlement risk is an important challenge for EMEAP members. In carrying out its study on FX settlement risk reduction measures, the Working Group will first conduct a survey to grasp the status of FX settlement risk and to promote risk reduction efforts in the EMEAP economies. The survey by the Working Group will be conducted with great reference to the "toolkit" prepared by the CPSS. The "toolkit" is of great help to the Group's work and the survey will be similar to the survey conducted by the CPSS. The survey is being prepared and carried out based on the experience of the Bank of Japan and the Reserve Bank of Australia. The Bank of Japan participated in the past CPSS surveys and the Reserve Bank of Australia has twice conducted its own surveys.

After conducting the survey, the Working Group will discuss risk reduction measures discovered from the survey, including the analysis of various conceptual models of PVP linkage.

National Payment Structure. Reflecting the different stage of economic development and historical background, the national payment structure of each member economies may have its own characteristics. The survey is aimed at enhancing mutual understanding of national payment system structure and its evolution, which will provide useful information for payment system reform.

It is envisaged that the Working Group's work on the national payment structure will be in line with EMEAP's contribution to the future works of the CPSS Red Book.

The survey will be useful to identify risks inherent in the systems. Risk analysis of payment systems contributes to the implementation of the core principles for systemically important payment systems.

Input from the CPSS. EMEAP is a cooperative organisation among members in the region but it is also very important to cooperate with other initiatives outside the region, and of course with the CPSS. Input from the CPSS motivates EMEAP activities a great deal.

The CPSS Workshop on current topics in payment and settlement systems held in Hong Kong in May 1999 covered various payment issues. Not only EMEAP members but other Asia-Pacific central banks participated in the Workshop.

The Workshop on the implementation of the core principles on payment systems held in Bali, Indonesia in March this year was a good opportunity to enhance understanding of the core principles and to discuss practical issues of the implementation. Feedback form the participants may have contributed to the ongoing work of the CPSS Task Force.

EMEAP website. If you are interested in EMEAP activities, the EMEAP website (http://www.emeap.org:8084/) provides you with useful information. The whole text of the EMEAP Red Book and EMEAP Review is available on the website.

The BIS process and the CPSS Core Principles
Gregor Heinrich,[8] Head of the CPSS Secretariat, Bank for International Settlements

In my presentation, I will briefly outline the role that the BIS, the CPSS and other international organisations play in the important task of strengthening the payments infrastructure.

We can make a very general observation that netting systems, in the area of large-value payments at least, are increasingly being replaced by RTGS systems. In some Latin American and Caribbean countries, RTGS systems have recently been introduced and in most others, introduction of RTGS systems is imminent or the focus of an ongoing reform project. And where netting continues to be of importance, many steps have been taken to also improve those systems and to improve the relevant contractual and statutory texts.

Both phenomena are the results of steps towards reducing risk; and many of these steps have been recommended by the CPSS and the BIS.

Why would anyone wish to provide advice on payments and payment systems in an international context? The short answer is "because risks in payment systems can pose a threat to financial stability". As the 64th BIS Annual Report (1994) already stated: "Payment and settlement systems are to economic activity what roads are to traffic: necessary but typically taken for granted unless they cause an accident or bottlenecks develop." This is a relatively recent concern. What has changed in the last 10 or 20 years?

Probably the most evident reason is the phenomenal growth in financial market activity. Estimates compiled by the CPSS indicate that these systems transfer the equivalent of over 6 trillion US dollars per day in the G10 countries,[9] a large portion of which is related to the settlement of financial market transactions. Since financial transactions almost invariably involve some form of payment, one product of this market growth has been growth in the values that have to be handled by payment systems - many of which were originally ill equipped to handle the activity. This growth has occurred in terms of both the total number of individual payments and related messages as well as of the total amounts involved in payments. The result: a substantial increase in risks.

Payment systems involve many risks. The prime concern here - ie from the point of view of regulation - is counterparty risk. That is, credit and liquidity risks arising from the interbank exposures which exist in many payment systems. More specifically, the concern is with counterparty risk where it is extreme enough to cause systemic risk - namely, the risk that, because of these interbank

[8] Thanks are due to Robert Lindley, Deputy Head of the CPSS Secretariat, for valuable input, in particular the overview on "The driving forces".

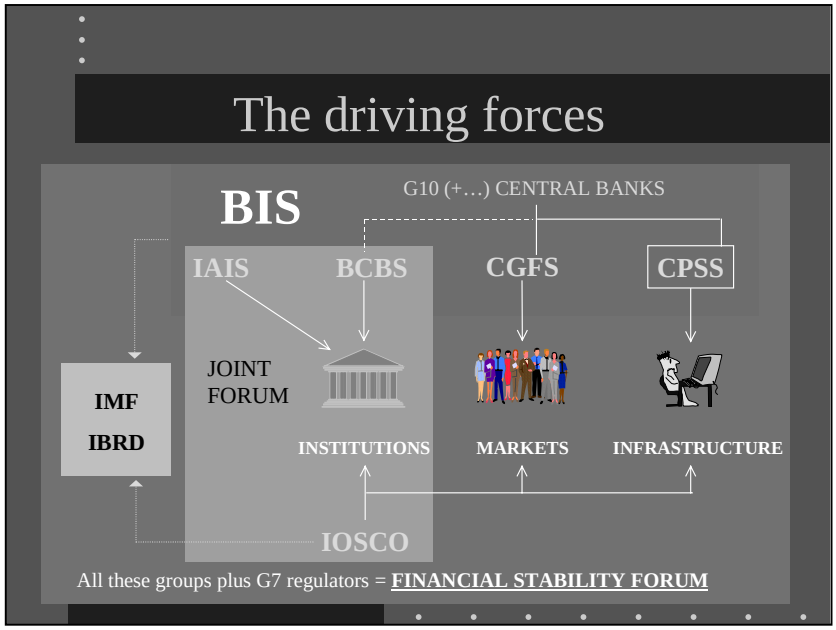
[9] Bank for International Settlements, *Statistics on Payment Systems in the Group of Ten Countries* (figures for 1998), March 2000.

exposures in payment systems, the failure of one bank participating in a payment system will cause the failure of others.

Concern with financial stability generally is very prominent in discussions taking place at the level of central banks, international regulators and international financial institutions. It needs to be stated from the outset that no one actually "regulates" international payments on a global level. That may explain why a large number of international bodies are anxious to provide guidance. And quite frequently, it seems, there appears to a new proposal, be it from the public or private sector, for expanding or coordinating the process.

Recommendations are formulated and guidance is offered not only with regard to payment systems of course. Indeed, concerns relating to payment and settlement systems are a relatively small, albeit important, part of the overall picture. The CPSS Core Principles for systemically important payment systems, for instance are part of the "Compendium of Standards" compiled the by the Financial Stability Forum (FSF) that now contains over 40 standards, principles or best practices that are considered important for strengthening and maintaining financial stability.[10]

A brief (and oversimplified) guide to those bodies most relevant to payments and related processes appears below.



We can think of the financial system as having three components - the institutions that trade, the markets they trade in, and the infrastructure used to support the markets - particularly payment and settlement mechanisms. With regard to supervision of ***institutions***, the relevant structures in which regulators cooperate are the Basel Committee on Banking Supervision (BCBS), the International Association of Insurance Supervisors (IAIS) and the International Organization of Securities Commissions (IOSCO). With regard to ***markets***, IOSCO is also interested in the markets for securities and the supporting infrastructure. The Committee on the Global Financial System (CGFS) takes a

[10] This Compendium provides a common reference for the various economic and financial standards that are internationally accepted as relevant to sound, stable and well-functioning financial systems. As the Compendium is posted on the FSF's website (http://www.fsforum.org), it serves as a gateway or point of entry for financial authorities and market participants to access the sites where the complete standards, supporting documents, and assessment methodologies referenced in the standards are located. The Compendium aims to signal the importance attached by the international community to the implementation of these standards and sound practices, and facilitate the dissemination of information on them. A Forum document listing ongoing and recent work relevant to sound financial systems is also available at the Forum's website.

more general interest in the way markets behave and is concerned with the stability of markets. The main body with an interest in ***infrastructure*** is the Committee on Payment and Settlement Systems (CPSS).

The CPSS, CGFS and, to a degree, the BCBS are subgroups of the G10 central banks and report to their Governors. These three G10 groups plus the IAIS are all based at the Bank for International Settlements in Basel.

Cooperation between the CPSS and IOSCO takes place through joint working groups and publications, for instance with regard to the ongoing work of preparing recommendations for securities settlement systems.[11]

The CPSS, created in 1990, serves as a permanent forum for the G10 central banks to monitor and analyse developments in domestic payment, settlement and clearing systems as well as in cross-border and multicurrency settlement schemes. Increasingly, non-G10 central banks participate in the work of the CPSS. The Committee also provides a means of coordinating the oversight functions to be assumed by the G10 central banks with respect to payment systems. In addition to addressing general concerns regarding the efficiency and stability of payment, clearing, settlement and related arrangements, the Committee pays attention to the relationships between payment and settlement arrangements, central bank payment and settlement services and the major financial markets which are relevant for the conduct of monetary policy.

The CPSS undertakes specific studies in the field of payment and settlement systems at its own discretion or at the request of the G10 Governors. Working groups are set up as required. Efforts are made to ensure that a wide range of expertise is brought to bear on the issues of concern to members of the Committee. The Committee, under the auspices of the BIS, has published various reports in recent years covering large-value funds transfer systems, securities settlement systems, settlement mechanisms for foreign exchange transactions, clearing arrangements for exchange-traded derivatives, retail payment instruments - including electronic money, and of course the "core principles".[12]

As mentioned before, at the international level there are no regulators as such, and the CPSS is not a regulator for payment and settlement systems. Rather, the CPSS, like the other Basel-based committees, produces analysis and guidance which national authorities can use. Institutions such as the IMF and World Bank - within their mandate - can and do encourage adoption and implementation of such guidance as part of the assistance they provide.

If guidance is to be effective, it has to be of high quality. As the CPSS has no regulatory powers, the guidance it produces has to convince people and other institutions, it has to be relevant and useful in helping them decide what to do.

For the CPSS, the guidance is produced by the so-called "Basel process" - as indeed it is for all the Basle-based groups. This involves bringing national experts together. Drawing on their diverse experience they discuss and analyse issues in order to reach a common understanding. The function of the employees of the BIS is to support this process, and the BIS provides the shell in which the experts from the central bank and/or supervisory institutions can discuss openly in an atmosphere of trust and confidentiality.

This is the process that has produced the well-known "Lamfalussy Report" and all existing CPSS reports and that is also applied to the most recent CPSS efforts to reduce risk in payment and settlement systems as a contribution to strengthening financial stability: the "core principles for

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[11] Other examples: the Report on Securities Lending (July 1999) or the "Disclosure framework for securities settlement systems" (February 1997) (http://www.bis.org/publ/cpss20.htm). Many securities settlement systems have in the meantime made information on their system's operation and its allocation of risks available to the general public (http://www.bis.org/publ/cpss20resp.htm).

[12] Most publications are available via the Bank's website at http://www.bis.org. The "Red Book" on payment systems in the G10 countries is periodically revised and a statistical update of the data it contains is published every year.

systemically important payment systems", the ongoing work with IOSCO on securities settlement systems, as well as the ongoing work on settlement systems for retail payments. All these efforts are being addressed in greater detail during this workshop.

(b) Securities settlement systems

The relevance of proper linkages between national payment and securities settlement systems: the experience of Sweden
Martin Andersson, Head of Financial Systems Division, Sveriges Riksbank

Thank you for this opportunity to share with you some of our experiences with settlement of securities in Sweden.

In Sweden there are two main securities settlement processes. The main difference between the two is that one is for stocks and one is for debt securities. Both settle once a day on a multilateral net basis. The same two processes exist for the Swedish krona and the euro, but the settlement in euros is quite limited. In addition to these multilateral processes, there is also a real-time gross settlement process in place, but it is very rarely used.

Each account in the securities settlement system, SSS, is assigned to a clearing member. For settlement of the payment leg, clearing members who are not participants of the central bank's payment system must use a settlement bank which is a participant. The payment leg is settled on a net basis for each settlement bank over an account in the central bank held in the name of the SSS.

Using the terminology from Parkinson's DVP report, the settlement processes are so called "DVP model 3" processes. As is stated in the Parkinson report, failure of a participant can have significant systemic effects. In Sweden, in case of a failure of a clearing member, there is an unwinding procedure, with certain commitments on the surviving clearing members to make additional transactions, such as repos, in order to make it possible to settle the remaining transactions.

Even though there has been no failure so far, the Swedish central bank has urged for a settlement process with less systemic risk. At last, we are now in the process of discussing how this is to be achieved in practice.

There are some institutional aspects that perhaps make Sweden somewhat different from your countries. The most important difference is the ***account structure*** in the central securities depository, CSD. In Sweden, as in the other Nordic countries, ie Denmark, Finland and Norway, the CSD keeps account for the individual end client. This means that VPC, the Swedish CSD, has 3.4 million accounts. In comparison, I believe that the German CSD has less than 1,000 accounts. The advantage of having the CSD keeping accounts for the individual end client is that the end client's risk and cost will be reduced. However, the clearing and settlement process becomes more burdensome.

Another institutional aspect worth mentioning is the ***ownership*** of the SSS/CSD. In Sweden, as from last year, the Swedish SSS/CSD is a privately owned company, owned by the four major Swedish banks. You could say that there is tradition in Sweden for private for-profit institutions in the financial market. The Stockholm Stock Exchange was one of the first stock exchanges in the world that was purely private and owned by a company listed at a stock exchange. I believe that on the trading side this ownership has been very beneficial for the financial market in Sweden. Hopefully also the securities settlement will benefit from private ownership. One should, however, be aware of the fact that there is a risk of conflict of interest with owners who conduct business that might compete with the SSS, eg custodian business.

Currently, we can see a trend in Europe towards growing consolidation in the securities settlement industry with the forming of Clearstream out of Cedel and Deutsche Börse Clearing and the merger between Euroclear and SICOVAM. Hence, it might be worth saying a few words about a regional idea

that might be of interest for you. The Swedish, Danish and Norwegian SSSs in 1998 and 1999 discussed the idea of merging their business to form what could be regarded as a ***regional hub***. This project, S4, Scandinavian securities settlement system, regrettably failed, partly due to unclear ownership in some of the countries.

One quite natural alternative to ***net*** settlement is of course ***gross*** settlement. There is currently a real-time gross settlement process in place in Sweden, but in practice this process is very rarely used, since the process is not fully integrated with the banks' systems.

A move to gross settlement has some implications that are of concern to a central bank. One is the increase in the need for ***liquidity*** that it will lead to. There are at least two ways that you can offset this. One is to settle at a time during the day when the liquidity is there, or there is idle collateral that can be used to create liquidity. Such a time could be the night. There are also other ways to create liquidity when it is needed. If the purchased security is eligible for intraday liquidity in the central bank, the central bank can supply the liquidity in the same moment as the settlement takes place. The term ***self-collateralisation*** has been used for this solution. A combination of the two methods is of course the most efficient.

One other major implication of gross settlement is how it effects the central bank's ***payment system***. If each transaction is to be settled in the central bank settlement system there will be quite a substantial volume of payments. One very efficient way is to assign (outsource) the task of accounting for these accounts to the SSS/CSD. This will enable truly simultaneously settlement of the securities and payment legs and still achieve settlement in central bank money. When a settlement bank wants to use a settlement surplus for other purposes than settling new securities transactions, the funds are transferred to the settlement account used in the central bank's payment system. Of course such a solution where you outsource important tasks to a third party, the SSS, requires a tight legal framework and tight controls. The term ***autonomous settlement*** has been used for this solution, in contrast to ***interfaced settlement*** where the payment leg of each settlement transaction is done in the normal payment system.

The alternatives described here are by no means Swedish inventions. For example, ***autonomous settlement*** with ***self-collaterisation*** is currently used with great success in the French RGV system. In Sweden we are currently using the RGV system as our model for the future, but no final decision on the future system has yet been made.

One alternative, or perhaps a complementary solution, would be to use a central counterparty, eg the Swedish derivatives clearing house - OM. By using a central counterparty the number of transactions to be settled is substantially reduced, since all transactions in the same security can be netted for each counterparty. The central counterparty will require collateral to be posted for the settlement risk, and hence many of the existing weaknesses in the current netting system would be eliminated.

From the perspective of the Riksbank both these alternatives will improve the current system in a way that increases efficiency and enhances financial stability.

The relevance and experience of central bank oversight of central securities depositories

Enoch Ch'ung, Senior Director of Risk and Technology Department, Monetary Authority of Singapore

Overview

This presentation aims to provide a better understanding of the role played by the Monetary Authority of Singapore in the oversight of the central securities depository. The presentation will begin with an introduction of the central securities depository in Singapore, Central Depository Pte Ltd (CDP), followed by a description of the clearing and settlement functions performed by CDP. MAS's oversight of the stock exchange and CDP, as well as its role in the financial sector, will be elaborated

in greater detail in the next section. The presentation will end with coverage of various trends and recent developments.

Central Depository (Pte) Ltd

Formed in 1987, CDP is a wholly owned subsidiary of the Singapore Exchange,[13] SGX (previously known as the Stock Exchange of Singapore). CDP operates as a central depository for all deposited securities quoted and listed on SGX. These securities include stocks listed on the SGX Main Board, SGX SESDAQ and corporate bonds. CDP clears and settles securities transactions and effects book-entry transfer of these securities.

Clearing and settlement systems

CDP operates both clearing and settlement systems. In August 1997, CDP enhanced its Institutional Delivery Affirmation System (IDAS) to allow for trade settlement on a delivery versus payment (DVP) basis. This enhanced IDAS system provides an almost simultaneous exchange of securities and same day funds for the settlement of institutional trades.

Implemented in October 1998, the Debt Securities Clearing and Settlement System (DCSS) clears and settles transactions involving Singapore dollar debt securities. International custodians such as Euroclear and Clearstream can settle their transactions via their depository agents in Singapore.

CDP is currently linked to Depository Trust Company, Japan Securities Clearing and Cedel Bank by maintaining an account with the foreign depository.

Regulatory framework

The Singapore Exchange (SGX) is a self-regulatory organisation (SRO), which performs market surveillance, enforces rules and ensures that prudential standards are maintained by its member companies. SGX comes under MAS's purview and is regulated under the Securities Industry Act (SIA)[14] administered by MAS. The key regulatory powers over the Exchange under SIA include the authority to gather information from the exchange, the right to inspect the exchange, the authority to amend rules of the exchange, and the power to issue directives to the exchange.

In addition to supervision by the SGX, CDP is also subjected to the Company (Central Depository) Regulations 1993 in the Singapore Companies and Securities Legislation. The Company (Central Depository) Regulations 1993 grant MAS the right to inspect CDP, under conditions of secrecy, and be given access to the books, accounts, documents and transactions of the depository.

MAS also receives quarterly reports on the outcome of CDP's stock count, which serves to verify the accuracy of the Depository Register and any record of account relating to depositors kept by the depository. This provides the second level of audit, in addition to SGX's surveillance.

Role of MAS

With oversight of key intermediaries such as the stock exchange, central securities depository and brokerage firms, MAS plays an important role in harmonisation of policies and strategies to ensure the orderly development of the financial sector. Besides being the consolidated regulator for the financial

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[13] The Singapore Exchange is a demutualised, integrated securities and derivatives exchange, resulting from the merger of the Stock Exchange of Singapore (SES) and the Singapore International Monetary Exchange (SIMEX) on 1 December 1999.

[14] Website: *http://www.mas.gov.sg/singfinsec/index.html*

sector, MAS also owns and operates the real-time gross settlement system (MAS Electronic Payment System). MAS plays a major role in the development of the market infrastructure, ensuring that it is sound and efficient.

MAS facilitates the development of the financial infrastructure by encouraging early adoption of best practices and standards recommended by the International Securities Service Association or Global Straight Through Processing Association. In addition, MAS is also actively involved in regional and international forums, like the central banks' Working Group on Payment and Settlement Systems of the Executives Meeting of East Asia Pacific Central Banks (EMEAP) and the G10 central banks' Committee on Payment and Settlement Systems (CPSS), where discussions on inter-central bank cooperation in the area of payment and settlement systems are held.

Trends

Increasingly, with growing competition from electronic communications networks (ECNs) and alternative trading systems, the SGX faces challenges in continuing to excel in its core role in providing a capital market infrastructure which will provide multiple instruments, serving issuers, investors and intermediaries across time zones.

There is a move towards shifting the SGX's regulatory role to other agencies to allow it to focus on its core competencies. In the case of the United States, NASD Regulations Inc. was created as a subsidiary of the National Association of Securities Dealers to separate the regulation of broker/dealers from the operations of the Nasdaq stock market.

In the move towards one single trading interface and integrated clearing, MAS is also currently exploring the migration of the clearing and settlement process of Singapore government securities from MAS to CDP. This migration will increase the accessibility to a comprehensive range of Singaporean and global products through a single point of access.

Recent developments

(a) On 28 April 2000, the Tokyo Stock Exchange and the Singapore Exchange signed a Memorandum of Understanding (MOU) for general cooperation between the two Exchanges, which will contribute to the development and efficient operation of their markets, as well as to investor protection. The MOU will be a platform for (1) the exchange of information for development, supervision and harmonisation of the two markets; and (2) the maintenance and fortification of sound and safe markets in both countries.

(b) The Singapore Exchange and the Australian Stock Exchange signed a Memorandum of Understanding on 12 April 2000 to further facilitate information-sharing and the development of the financial services industry in Australia and Singapore. This MOU will also provide a mechanism for long-term cooperation between the exchanges and assist in the maintenance of orderly securities markets in each country.

(c) The settlement period of securities transactions was reduced from T+5 to T+3 days from 15 March 2000.

(d) MAS is exploring the migration of the clearing and settlement process of Singapore Government Securities from the MAS to CDP. This would promote a single access capability with integrated clearing.

Implementing international standards in the national payment/securities settlement system reform process
Francisco Solis, Payment Sytems Manager, Bank of Mexico

I will start with a disclaimer: we are not claiming that our systems comply with international standards for design and operations. We realise there are many important tasks we need to perform before we can feel satisfied with our payment and securities settlement systems. However, we can confidently state that these standards have been very useful in our reform process.

Only after carefully reading some reports issued by multinational organisations, most notably the Lamfalussy Report sponsored by the central bank Governors of the G10, did we come to realise that we needed to pay much closer attention to our payment and settlement systems. Before that, we were under the illusion that solving the technical and accounting problems that we had been traditionally concerned with was enough. Without these reports, our reform would probably have started much later and we would be unaware of risks that we have already mitigated or that we are learning to control and manage.

The DVP Report, also sponsored by the G10 and written by a group chaired by Pat Parkinson, provides a clear example: the main requirement for the design of our securities settlement system was that it should provide DVP.

The resources available to improve our payment and settlement systems are limited and we need to use them efficiently. To do this, we need to make the most of other countries' experiences. We have been advised by other countries, taken their systems as models and attended seminars and workshops - most of them organised by CEMLA - to learn of new developments and to exchange ideas. However, we have found that adapting systems that took many years to develop, responding to needs that are usually very different to ours is not easy. For us, trying to comply with international standards has been the best way to take advantage of the valuable experience of other countries.

We believe that the principles, standards and recommendations on best practices that the groups chaired by John Trundle and Pat Parkinson are preparing will be significantly more useful than the previous reports, since they are being written for a much wider audience and deal with more general issues.

We do not see the new standards as a burden. Before we started reforming the payment system in Mexico, our Board of Governors set general guidelines to for the reform. We see the new standards and recommendations as an extended, more detailed version that will provide more guidance to proceed with the reform, helping us to get better systems.

Reading the draft version of the "Core Principles for Systemically Important Payment Systems" reminds us of some rather long arguments that would have been cut short if such a document had been available. This is a clear indication that it will be a valuable guide and will help us to reach a consensus faster, making our tasks easier.

We are sure we will find the recommendations for securities settlement systems will be just as useful for the aspects not covered by the DVP Report.

Module 2: Retail payment systems

Report on the activity of the CPSS Working Group on Retail Payment Systems
Carlo Tresoldi, Central Manager for Payment Systems and Treasury Operations, Bank of Italy, Chairman of CPSS Working Group on Retail Payment Systems

With a view to gaining a better understanding of the developments in the market for retail or small-value payment services in G10 countries and Australia, the Committee on Payment and Settlement Systems established in 1997 the Working Group on Retail Payment Systems, which I chair. The work of the working group is organised in three steps. The first step is represented by the report "Retail Payments in Selected Countries: A Comparative Study", published in September 1999, which focused on end user markets for retail payment instruments. The second step is represented by the report on "Clearing and Settlement Arrangements for Retail payments in Selected Countries" whose publication is currently under way and which analyses the clearing and settlement arrangements for retail payments in the same countries. The third step, still to be developed by the Working Group, deals with the central bank policy for retail payments.

1. The study of end user markets

The first report pointed out that retail payment instruments are diverse both within and among the selected countries. The analysis, which uses the statistical data available and associated anecdotal evidence, suggests that cash remains a primary retail instrument in the selected countries, even if the currency-to-GDP ratio varies considerably reflecting structural differences among countries: Japan retains the highest currency-to-GDP ratio (10.1% in 1990 and 10.4% in 1997), while the United Kingdom has the lowest ratio (2.8% in 1990 and 2.9% in 1997) and the United States lies in the middle (4.5% in 1990 and 5.2% in 1997). The average ratio of cash to GDP for all countries decreased slightly, from 5.6% in 1990 to 5.3% in 1997.

Although there are signs of convergence among the selected countries in the pattern of use for some types of retail payment instruments, there is still substantial divergence in the use of others. A number of common trends and developments that affect the use of various established retail payment instruments include - apart from, as we have just said, a continuing use of currency as a primary retail payment instrument for point of sale transactions - a long-standing movement, in terms of volume, towards electronic non-cash payments. In particular, there has been a substantial growth in card payments, whose share increased from 10% in 1990 to 22% in 1997 (with debit cards rising from 3% to 13%) and a trend towards greater use of credit and debit transfers.

Nonetheless, some differences among countries still remain. In terms of non-cash payments, in 1990 Australia, France, the United States, Canada and the United Kingdom (so-called cheque-based countries) relied most heavily on cheques for retail payments, while Belgium, Germany, Italy, Japan, the Netherlands, Sweden and Switzerland (so-called giro based countries) relied most on debit and credit transfers. According to the report findings, in 1997 in cheque-based countries cheques continued to be the most widely used instrument in Australia, France and the United States (even if its importance has diminished), while payment cards have become the most widely used instrument in Canada and debit and credit transfers in the United Kingdom. Conversely, giro-based countries continue to rely mainly on debit and credit transfers.

New developments are taking place in the market for retail payment instruments. The application of modern technology has facilitated innovation in retail payment instruments and services. This could lead to the emergence of ***new instruments*** such as card-based e-money (electronic purse) or the development of ***new electronic payment delivery and processing such as internet payment methods*** (internet credit and debit transfers, electronic cheques), most of which are essentially new distribution channels for traditional payment instruments. However, ***traditional payment methods, such as***

payment cards, are still mainly used over the internet. As a last point, new developments in retail payment systems include an ***increased use of cross-border payments***.

2. Analysis of clearing and settlement arrangements

The second report on "Clearing and Settlement Arrangements for Retail Payments in Selected Countries" provides an analysis of the structure and most relevant trends concerning clearing and settlement arrangements for retail payments. It also focuses on risks, efficiency and the role played by central banks in this area.

The report presents, first, a conceptual framework providing some background on the payment process, which can be divided into three phases: the transaction process, the clearing process and the settlement process:

- the ***transaction process***, which ensures the valid creation of a payment instruction, includes a number of main steps: verification of the identity of the involved parties; validation of the payment instrument; verification of the ability to pay; authorisation of the transfer of the funds by both the payer and the payer's financial institution; communication of the information between the financial institutions involved; processing of the transaction;
- the ***clearing process*** aims at ensuring the exchange of the payment instrument or of the relevant payment information between the payer and the payee's financial institutions as well as the calculation of claims for settlement;
- the ***settlement process***, in which the claim from the payee's institution is discharged by means of a payment from the payer's institution to the payee's one. Steps in the settlement process are: the collection and integrity cheque of the claims to be settled; the availability of funds for settlement; the settling of the claims between the financial institutions; the communication to the parties involved.

Each phase of the payment process may be organised according to different structures. Furthermore, in each phase specific risks may emerge. However, even if retail payment systems typically do not pose an immediate danger to systemic stability, a variety of risk reduction measures are adopted to protect such systems against systemic risk.

The structure of the transaction process varies depending on the different payment instruments used. With respect to the timing of these activities, two broad categories exist: immediate authentication and authorisation, as happens for example with credit transfers and payment cards; deferred authentication and authorisation, as is the case with cheques or direct debits.

In the ***transaction phase*** the main risks are the risk of fraud and operational risk. The ***risk of fraud*** - which can be defined as the risk that a wrongful or criminal deception will lead to a financial loss for one of the parties involved - is particularly relevant for retail payments. Examples range from forging a signature on a payment instruction such as a cheque or a credit transfer to obtaining access, from a remote location, to the computer of a financial institution under a false identity. ***Operational risk*** - which can be described as the risk of incurring a financial loss because of various types of human or technical error - can arise from the failure to follow or complete one or more steps in the prescribed authorisation process. Examples range from a terminal that is offline for a few minutes because of a telecommunications problem to the failure of a computer authorising card payments that causes the whole payment card network to be down for hours or longer.

The main ***risk management measures*** that can be put in place in the transaction process seek to ensure that the transaction is valid and to minimise errors. To the extent that some errors and problems will remain, these measures attempt to allocate responsibility among all parties involved. These measures include: monetary and time limits (per transaction, per payment instrument, per client); personal authorisation codes such as PIN numbers; the use of certified equipment with a certain degree of resistance against tampering; online verification of account balances; cryptography to ensure the authenticity of the payers and the integrity of the information related to the transaction; and digital certificate mechanisms, sometimes also referred to as PKI (public key infrastructure) technology.

The analysis provided in the report shows that a number of similarities exist in the structure of clearing and settlement arrangements for retail payments in the G10 countries and Australia. In particular, the same type of clearing and settlement arrangements, mainly multilateral clearing and settlement systems, are in use in all countries. In addition to this, nearly all countries have dedicated clearing arrangements for payment cards which are increasingly based on automated procedures. The report also notes the increasing role of the private sector in providing clearing services. In particular, in almost all countries clearing arrangements for payment cards are operated solely by the private sector. As the share of these instruments in the overall use of payment instruments rises, so will the share of private sector arrangements in the overall provision of clearing arrangements. However, in all countries emerging payment instruments are still cleared and settled through traditional arrangements. Lastly, the analysis shows that in the field of cross-border payments the use of correspondent banking is still significant and that payment card networks are widely used. Furthermore, a number of initiatives are under way in the field of cross-border retail credit transfers for the design of ACH solutions.

Risks emerging in ***clearing and settlement systems*** include: operational risks, legal risks, settlement risk and systemic risk.

In order to mitigate operational risks, in most countries the providers of clearing and settlement services are required to ensure, as a rule, an adequate degree of operational reliability for timely completion of the daily processing through: adequate information systems; internal controls; backup facilities; business continuity plans (adopted in order to counteract interruptions in a managed way); and risk analysis (used to identify the assets and operations to be protected and the potential threats to the system as well as to define safeguards and countermeasures).

Moreover, measures for mitigating settlement and systemic risks, especially in multilateral clearing systems, are directed at controlling the exposures participants incur and could have the ability to absorb potential losses. This is mostly achieved by applying a combination of preventive and/or expost measures. Preventive measures include access criteria, legal rules and bilateral/multilateral limits, while expost measures comprise loss-sharing arrangements, unwinding procedures, etc.

Efficiency is very relevant for retail payments. In fact, an efficient payment system is crucial to the proper functioning of the entire economy because it facilitates the exchange of goods, services and assets. The speed and ease with which payments can be executed will therefore have the potential to affect economic activity. Technical or productive efficiency refers to providing a certain amount and quality of payment services for a minimum of costs. Briefly, the speed of processing, the accessibility and convenience of the system, and its reliability and accuracy are all aspects of quality that may add value to users.

Cost reduction beyond a certain point may result, however, in a slower and less accurate service. Furthermore, there is a trade-off between risk and efficiency. Of course end users prefer lower risk to higher risk associated with payment transactions, but lower risks generally entail more costly payment procedures. Therefore, an adequate balance between risks and efficiency must be pursued.

However, we have seen that over time payment systems have become more efficient as lower-cost payment processes replace higher-cost ones and the system becomes faster, more reliable and more convenient. An example is provided by debit cards, which have been increasingly replacing cheques in most countries. An important contributing factor has been technology, but an equally important factor has been ***standardisation***. Payment systems may share the characteristics of a variety of economic networks, and as such their value to users and participants may increase as more users are attracted. Standardisation has helped to avoid fragmentation of payment systems in some countries. Standards can be divided into: technical standards, which establish common rules with respect to features of payment instruments or systems; and business standards, implemented for example via interoperability agreements, which allow for the reciprocal use of payment instruments.

Standards can have a number of positive effects on efficiency and competition. At the domestic level, standards have been developed largely by private organisations and associations of financial institutions. Central banks often play a role in fostering the development of such standards, either in the exercise of oversight responsibilities or as a result of their own interests as participants.

The report also deals with the ***role of central banks***. Central banks have an operational role in the clearing and settlement services; some of them also perform a formal oversight role with respect to retail payment systems.

Each central bank offers a different set of payment services which reflect the different mix of environmental factors that apply to each central bank resulting from a mix of legal, social, political, international and competitive factors. The range of clearing services extends from cooperation with private systems to the direct supply of services. The extent to which central banks are operationally involved in retail payment systems varies considerably. All central banks provide settlement services for interbank payments. In recent years central banks in some countries have started to offer new settlement services.[15] In particular, in countries like Japan, the Netherlands, Switzerland or Sweden the central bank does not perform any operational function in retail payment systems at all, apart from offering settlement services. In other countries central banks have different degrees of involvement in the clearing services. In Australia and the United Kingdom the central bank is a shareholder in some of the private clearing arrangements and is thus able to influence these systems. In Canada the central bank participates in private clearing arrangements. In the remaining countries (Belgium, France, Germany, Italy, the United States) central banks are directly involved, even if to a different extent, in the provision of clearing services.[16]

Many central banks have explicit legal authority with respect to payment and settlement systems. The laws establishing a country's central bank or other national laws often contain a broad statement that the central bank should promote the smooth operation of payment systems. These statements serve as a basis for the central bank oversight over large-value payment systems; in some countries they also provide a basis for central bank oversight of retail payments.

The configuration of infrastructure arrangements prevailing in the G10 countries and Australia has been influenced over time by a variety of factors depending on the demand side, the supply side and the industry and public policy choices.

On the demand side, the main factors include: economic growth, integration of markets, and financial sector consolidation. Economic growth brings forth an increase, in terms of volume and value, in the exchange of goods and services within the economy, which, in turn, leads to an increase in the number of payments to be made. The process of integration of markets at the international level has increasingly accelerated in recent years, thus raising the demand for cross-border payment services. Over the past two decades, there has been a market trend towards consolidation of financial institutions around the world. Consolidation can have various effects on retail infrastructure arrangements: the more consolidated the financial sector, the higher the proportion of transactions that will be in-house transactions; consolidation may also lead to more efficient clearing by increasing economies of scale within a financial institution. Consolidation can also occur at the level of the payment system infrastructure.

On the supply side, advances in electronics and telecommunications are rapidly bringing down the cost of IT equipment and the unit cost of data processing and transmission. On the one hand, this allows financial institutions to optimise their distribution strategy by promoting the most efficient distribution channels and, on the other hand, it allows customers to choose from a wider variety of payment instruments. The application of information technology can bring about a widespread standardisation of formats and procedures for the different payment instruments which results in increasing efficiency of clearing processes for payment instruments. Financial intermediaries, through

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[15] One example is the Federal Reserve, which recently introduced an enhanced settlement service that combines and improves on selected features from its existing net settlement services.

[16] In Belgium a private ACH is operated by the central bank. The Italian central bank directly manages the clearing houses where retail instruments such as large-value cheques and other paper based instruments are handled. In France and the United States the central banks administer nationwide cheque clearing operations. The French central bank is also a shareholder in the ACH arrangement and the US central bank owns and operates the largest ACH system. The German retail payment system is run by the Bundesbank.

the revision of internal procedures, can put in place fully automated procedures from end user to end user eliminating any need for manual intervention (so-called straight-through processing). The outsourcing of some clearing activities has broadened markedly in recent years as a result of the specialisation in equipment and applications which has made the process of clearing separable into various activities.

The last important factor which has contributed to progress in clearing and settlement arrangements is related to ***the industry and public policy choices***. The long-term dismantling of regulatory barriers to foreign trade and to capital movements has fostered the process of international integration of financial markets and of markets for goods and services, thus affecting the demand for all types of retail payment services. The process of standardisation of technical features of payment instruments at the global level is frequently driven by major players (eg EMV and SET standards for payment cards). In the European Union, public authorities have also devoted great attention to improving the efficiency of cross-border retail credit transfers, acting as a catalyst for change by being particularly involved in the promotion of the implementation of standards. In some cases central banks, or more generally public authorities, play an important role in facilitating the introduction of new arrangements. A typical way of doing this is by intervening to change existing rules in order to support the development of new payment systems and new instruments (eg a change in commercial law to facilitate the introduction of cheque truncation).

In conclusion, the range of clearing and settlement arrangements available today is a reflection of the economic, business and technological environments existing in the G10 countries and Australia. The retail clearing and settlement arrangements are in an evolving process also driven by the application of information and communications technology to payment processes. It is difficult to predict where this evolution will lead. What we can see now is the dynamic nature of retail payment systems.

Electronic bill presentment and payment[17]
Lawrence J Radecki, Assistant Vice President, Payments Studies Function, Federal Reserve Bank of New York

While credit or debit cards are often used in the United States to make purchases electronically at the point of sale, most recurring household bills are paid with personal cheques. Estimates place the volume of recurring obligations, such as utility bills and instalment loans, at approximately 16 billion annually. The prevalence of personal cheques, however, may soon begin to decline.

Several electronic bill presentment and payment systems - "e-billing" systems - are at an early stage of implementation. Utility companies, merchants and financial institutions can use these systems to both transmit bills and account statements to their customers and receive the returning payments and remittance information. The entire exchange takes place over the internet. The system operator may post bills on its own website or on a website belonging to the biller, the customer's bank, a non-bank provider of financial services or an internet portal.

To receive and pay bills over the internet, a customer must specify which deposit account should be drawn on to complete transactions. Then the customer can review billing statements on a computer screen and click on a special icon to initiate payment. Once initiated, the system operator routes the payment. Funds are moved between banks by using the ACH network or an alternative method for

[17] This presentation is based on the article by Lawrence J Radecki and John Wenninger, "Paying Electronic Bills Electronically," Federal Reserve Bank of New York ***Current Issues in Economics and Finance***, volume 5, number 1 (January 1999). The paper is available at the Federal Reserve Bank of New York's website, www.ny.frb.org. The views expressed in this presentation are those of the author and do not necessarily reflect the position of the Federal Reserve Bank of New York or the Federal Reserve System.

settling retail payments. The system operator closes the bill payment loop by sending remittance information to the biller in an electronic form for automated account reconciliation.

Distribution of economic benefits

If e-billing is used on a large scale, the main beneficiaries will naturally be the ***system operators***, who stand to earn sizeable revenues and potentially high profits. But widespread adoption will also confer benefits to other participants.

- For a ***merchant***, the average cost of presenting and collecting a bill electronically is expected to be less than 30 cents. Billers are accustomed to paying 90 cents or more under the current paper-based system.
- At the very least, ***households*** would save postage. In addition, those households that pay their banks an account activity fee based on the number of cheques written would reduce this expense. But households may attach even more importance to the convenience of reviewing and paying bills online in a few easy steps.
- The overall impact of e-billing on ***commercial banks*** is unclear. Because banks operate retail lock-box and cheque-processing businesses, they could lose revenue to e-billing operators. E-billing, however, may prove to be a key application that leads retail customers to perform more banking electronically. If banks can shrink their branch office networks, they will lower their cost structure.

Conclusion

Households, billers and banks are already expressing considerable interest in e-billing systems, but it is still too early to know how rapidly the technology will be adopted. Households have shown inertia in switching to new payment methods. Nonetheless, high-speed internet access at home is rapidly increasing in the United States, which should facilitate adoption of e-billing, and consumers may respond very favorably to a technology that makes bill payment very easy.

Regulation of e-money, e-banking and e-commerce - issues for central banks

Martin Santema, Assistant Manager, Payment Systems Policy Planning, Netherlands Bank

Central banks pay much attention to developments that may influence the sound and reliable functioning of financial markets and that could have an influence on central bank responsibilities. Therefore, new technologies such as the introduction of e-money are closely monitored. Not all central banks have drawn the same policy conclusions from the developments in the market, however. In the following the views of the euro area central banks and the European Central Bank are expressed.

Electronic money can be defined as an electronic store of monetary value on a technical device that may be widely used for making payments to undertakings other than the issuer without necessarily involving bank accounts in the transaction, but acting as a prepaid bearer instrument. Under this definition e-banking, which can be defined as electronic access to a bank account, is not seen as a form of electronic money, but as a modern way of executing traditional payment functions. E-commerce may, or may not, involve e-money applications, depending on how the payments resulting from e-commerce are made.

In Europe, EU central banks as early as 1994 studied the issue of electronic money, which at that time predominantly took the form of an “electronic purse”, ie a plastic card containing purchasing power that could be widely used, for which the customer had paid in advance (a multipurpose prepaid card). The results of this study were published as a report to the Council of the European Monetary Institute, the ECB’s predecessor.

In 1998, a follow-up "Report on electronic Money" was produced by the ECB. This study focuses not only on electronic purses but also on software-based electronic money products for payments via computer networks.

In both reports the conclusion is that central banks welcome the potential increases in efficiency in payment operations resulting from the introduction of e-money and should therefore not constrain its development. At the same time, however, concern was expressed that large-scale use of e-money might have a negative impact on central bank responsibilities in the area of monetary policy, and might endanger the efficient functioning of payment systems and confidence in payment instruments. Therefore, euro area central banks and the ECB formulated a number of minimum requirements that have to be fulfilled by electronic money-issuing institutions.

These minimum requirements relate to:

- prudential supervision;
- solid and transparent legal arrangements;
- technical security;
- protection against criminal abuse;
- monetary statistics reporting;
- redeemability;
- reserve requirements.

In addition to these minimum requirements:

- interoperability of e-money schemes; and
- guarantee, insurance or loss-sharing schemes

are considered to be desirable objectives.

Recently, the European Commission published a draft directive on e-money, which basically endorses the views expressed in the ECB report.

In the Netherlands, as early as 1995 it was decided that loading value on a prepaid card is similar to taking money from the public, which is a banking activity in the Netherlands. Therefore, under Dutch legislation issuers of e-money have to be banks, or have to cooperate with banks. This means that these institutions have to comply with the requirements laid down in the Act on the Supervision of the Banking System. In addition, the Netherlands Bank drew up a framework for reviewing chipcard purse projects (software-based electronic money products for payments via computer networks have not been implemented to date, but would be subject to the same requirements). These supplementary requirements cover the ECB minimum requirements.

The review of the e-money schemes was undertaken by a multidisciplinary team, consisting of accountants, lawyers, security experts, payment experts and economists. Cornerstones of these reviews are: an individual analysis of systems; the use of an explicit framework to gain an insight into the complete system; a check of the design, implementation and operation of the system; and a verification whether banking and non-banking (eg loyalty) applications are appropriately separated.

In the Netherlands, at present two e-money schemes operate in parallel, both of which comply with central bank requirements. In total 20 million electronic purse cards have been issued (population 16 million). Actual use of these cards is still very low.

Electronic banking applications, which are usually in the domain of individual banks, are not evaluated in the context of e-money oversight and supervision, but are subject to regular banking supervision.

Aruba's clearing system
Reynaldo M Geerman, Manager, Operations Department, Central Bank of Aruba

Aruba is a small island economy in the Caribbean. It is part of the Kingdom of the Netherlands. Its mainstay is tourism. Per capita GDP is estimated at about USD 19,000, one of the highest in the region. There are six commercial banks and a number of specialised financial institutions.

Before 1997, the exchange of transfers and cheques (the Clearing) between the commercial banks was done manually at the premises of Central Bank of Aruba (CBA). In 1995, we learned about the ACH concepts as adopted in the USA. A project group was formed to introduce an electronic clearing system in Aruba and the Netherlands Antilles. Due to changing priorities, the project group was dissolved, and Aruba continued alone with this project.

After reviewing various available options we chose an ACH program[18] as the environment to work on. This program has been used in the United States since the 1960s. The strength of the ACH network is that it is widely used: over 20,000 depository institutions are participating in the system, 500,000 companies are originating ACH files, and about 60% of US households are using at least one ACH application. During the last five years, the volume of ACH transactions has roughly doubled. In 1999, the total value of transactions in the United States surpassed USD 19.4 trillion.

When we started in Aruba, we did not have any specific administrative law on cheques or transfers, like Reg E and the UCC4 in the United States. Also we did not have a routing number system to recognise a transaction. Only the name of the bank on a cheque or the name of the beneficiary bank on a transfer was readily available. So we had to solve these problems first, which was rather easy to do: we created a routing number system similar to that used by the American Bankers' Association, except for some minor adjustments. We also created the possibility to give each bank several routing numbers in order to enable them to settle in different currencies, for example:

0 for the ANG

1 for our national currency, the florin (AWG)

2 for the USD

3 for the NLG

4 for the FRF

The routing number system was designed in cooperation with the commercial banks in the Netherlands Antilles. The reason for this is that in the future we intend to execute cross-border transactions.

We adapted the ACH rules and regulations as established by the NACHA (National Automated Clearing House Association) to fit the Aruban environment and signed a special contract with the commercial banks to determine the rules of the game when conducting transactions. We did not choose to make a law, because it normally requires at least a couple of years to pass a law in Aruba.

The CBA clearing system complies with the following requirements:

– communication device;

– MICR transfer (cheques);

– electronic funds transfer.

Besides the requirements for the system itself, CBA stipulated that this project be realised on a cost-neutral basis.

[18] The software used for the ACH is the Goldnet/Goldline program from Equifax E-banking Solutions and for creating ACH files from cheque readers Sisco software from Comunicaciones ALVEL C.A.

To facilitate communication, we created predefined messages. After being communicated to CBA, messages are processed and settled separately on the account(s).

The most important feature of this system is the electronic cheque presentment in ACH file format. The information on the MICR line on the cheques is transmitted electronically from the ODFI (Originating Depository Financial Institution) to the RDFI (Receiving Depository Financial Institution). The information on the MICR line consists of:

– the cheque number: 6 digits;

– a routing number: 10 digits;

– an account number: 10 digits;

– the amount: 12 digits.

In the past, when we were clearing manually, it took up to four days before a cheque was paid. Now, with this system, it can vary from a few hours to a maximum of one day, depending on the process of verification of funds. The physical cheques still have to be exchanged. The exchange takes place (after the banks have sorted out the cheques that have been returned) at 10 am, ie 24 hours after the settlement date. Those cheques may still be returned, for any reason, with the exception of NSFs (not sufficient funds). The banks have 24 hours to do this.

To minimise loss of time, we embarked on an education programme together with the commercial banks to instruct the beneficiary how to accept a cheque. Attention should be focused on verifying the basic data, such as the date, amount in writing and figures, and most of all the signatures. If these are correct, then the only reason the cheque may be returned is because the payer does not have sufficient funds. For returned cheques we created a file format on which the banks can electronically return an MICR file. It basically works according to the same concept as an ACH return.

In the beginning, when we started testing the system, we ran about 3,800 cheques a day through the clearing. During 1998 we ran about 4,500 cheques daily. At this moment, we run around 4,300 cheques daily. The decrease in cheques processed is due to a more efficient use of payment products (ACH PC banking and internet banking). The total value of the cheques processed during 1999 amounted to USD 1.4 billion.

For government transactions we used two products that are well known in the United States: direct payment and direct deposit. The former we used to channel all payments from the government to its creditors. These payments were done manually in the past. The banks receive, on a daily basis, written instructions to pay their clients. The average number of daily government payments is now 400 transactions.

As of 1 August 1998, all government employees receive their salary through direct deposit. Approximately 5,000 transactions per month go electronically through the CBA clearing system to the commercial banks.

The banks have their mainframe systems connected to interface with the CBA clearing system; thus, all transactions are downloaded or uploaded to the mainframe. The number of transfers when we started the project was about 525 transactions a day. At this moment we process about 1,500 transactions daily. The total value processed during 1999 was about USD 1.2 billion.

Using ACH formats offers the possibility to handle regular credit transfers between the commercial banks, as well as to execute debit transfers. As of March 1999, we introduced direct debit for the utility companies. This enables the companies to directly debit a customer's account. At this moment, only 5% of all monthly payments are executed through standing orders with the commercial banks. Due to the introduction of direct debit, we expect an annual increase in standing orders by an estimated 10% over the next 5 years. In addition, as of January this year, we are applying the EBT concept on the island's Social Security Bank. This means that we pay approximately 15,000 pensions a month via the ACH.

It is clear that we have successfully introduced ACH in Aruba. We worked hard to obtain satisfactory results. But our efforts have certainly not been in vain. Rapid progress has been made, leading to

increased efficiency and cost reductions. The commercial banks have seen quite an improvement in their clearing operations. Efficiency has been raised and, consequently, costs reduced.

Let me conclude my address with some advice to you. Before implementing the ACH program in your country, you should be well prepared. It is a learning process to understand the concepts and to define the required use of this system. You should be willing to learn from the experiences of other countries, and, certainly, do your homework. Hopefully our experiences as reported here briefly will be useful to you.

Development or substitution of the cheque and the clearing houses - the Venezuelan perspective
Belkys Apolinar, Executive Adviser, National Operations Vice Presidency, Central Bank of Venezuela

Introduction

This paper focuses on the ***development or the substitution of the cheque as a payment instruments, and hence the possible abolition of cheque clearing houses, from the Venezuelan perspective.*** It is structured as follows:

- Sections 1 and 2 deal with the views of banking institutions as issuers of payment instruments and their participation in changes related to the cheque as the heavily most used means of payment.
- Section 3 deals with electronic services, payment instruments and media, and retail banking expectations and trends.
- Section 4 addresses the possibility of keeping the cheque as a payment instrument and consequently the cheque clearing houses as well as their application to other payment services.
- Section 5 briefly describes the payment system in Venezuela regarding low-value instruments, the use of electronic payment media and their trend.
- Finally, certain considerations are presented on each of the issues discussed.

The ideas expressed in this paper are not meant to be final conclusions, neither do they reflect the opinion of the Central Bank of Venezuela. Rather, they are the result of the study of the information gathered, the personal interviews held and the consultations to the work prepared by the BIS together with the assessment of the group that participated in its elaboration.[19]

The preparation of the paper encountered some limitations in connection with the gathering of statistical information on traditional payment means as well as the evolution, in figures, of so-called electronic payment means, services and products.

[19] Working Group: Belkys Apolinar, Executive Adviser, National Operations Vice Presidency; Yolanda de Fernández, Financial Consultant, Financial Market Analysis Management; Sonia Elcure M, Financial Analyst, Financial Market Analysis Management.

1. The cheque as a payment instrument

1.1 General considerations regarding its use

In spite of the availability of electronic payment means in the market, the cheque continues to be the most widely used instrument. This happens not only in countries with less developed payment systems but also in those countries that have made significant progress, as may be observed in the table below:

Percentage shares of payment instruments other than cash

	Cheque	Debit card	Credit card	Direct debit	Direct credit
United States	74	4	19	1	2
France	46	22	–	14	18
Australia	41	20	14	5	20
Italy	32	5	7	10	46
United Kingdom	31	18	13	19	19
Canada	31	22	31	7	9

Data are for 1997.

Source: Retail Payments in Selected Countries: A Comparative Study, September 1999, CPSS BIS.

Customers' preference for cheques may be explained by the following factors:

– In many countries, banking institutions have increased the supply of cheque-related products. The following table shows that, with the exception of Chile, Colombia and Argentina, more than half of the "bankable" population of the countries in the sample has a current account.

	Bankable[1] population (% of total population)	Current accounts (% of bankable population)
Spain	75	66
United States	60	147
Mexico	31	53
Chile	28	31
Colombia	25	22
Argentina	23	35
Brazil	20	164
Venezuela	14	70

[1] Bankable population: working population aged 18 or over with income exceeding USD 5,000 annually.

Source: Venezuelan Banking Association. Own statistics 1999.

– The current account is the product most widely used by banking institutions to attract customers due to its low financial cost in the first place.

– The operating architecture of branches has been designed to sell all products and services at the counters and is available according to a predetermined number of branches per inhabitant.

– Stimuli to issuers promoting the use of the cheque over other payment instruments:

  - Floating utilisation at no charge.
  - Product diversification, as is the case of guaranteed cheques, remunerated current accounts and cheque elaboration services, which increases acceptance by beneficiaries.
  - Initial costs of electronic payment media versus the volume of transactions to be handled.

- The pricing strategy applicable to electronic payment media is generally more expensive.

– Initial technology costs related to the development of a new product and fear of replacement of proven technology. It is difficult to build confidence, this being one of the stronger barriers.

– Factors related to electronic payment media: operational risks, system collapse, fraud and the legal framework, among others.

In spite of its being the most widely used payment instruments, over the last decade the cheque payment growth rate has proved lower than that of other newer, more technologically advanced instruments.

Among the factors that drive this behavior, the following may be mentioned:

– The high proportion of cheque use turns into the main component of transformation costs for issuing institutions. As may be observed below, in countries such as the United States and France, which are characterised by a high use of the cheque, expenses associated with cheque processing account for a high percentage of transformation costs.

– In lower-productivity countries such as Venezuela, the ratio is atypical (75%) when compared to other Latin American countries in the sample.

– A third group of countries reflects a productivity and a cheque processing expenses ratio primarily explained by a low use of the cheque in their market:

	Transformation costs/ total assets	**% Cheque processing costs/ transformation costs**
Venezuela*	13.8	75
United States	3.5	74
Mexico*	9.3	46
France	1.0	42
Chile	2.0	39
Colombia*	7.0	34
United Kingdom	2.4	30
Italy	2.2	29
Argentina	4.9	24
Brazil	6.9	24
Germany	1.7	8
Belgium	1.3	8
Netherlands	2.3	3
Sweden	1.6	3
Switzerland	1.9	2

Data are for 1998 (*1999).

Source: Venezuelan Banking Association.

– Oversupply of branches directly influencing transformation costs:

	Branches/million inhabitants	Branches/million bankable inhabitants
Spain	893	1,191
United States	274	457
Brazil	207	1,035
Venezuela	128	912
Argentina	120	521
Colombia	109	435
Chile	89	317
Mexico	69	248

Source: Venezuelan Banking Association.

1.2 Final considerations

In spite of constant innovations, the cheque continues to be one of the most important payment instruments in the market economy and, given its attributes, it could prove difficult to substitute.

Cheque issuers (banking institutions) are challenged to reduce cheque processing costs. Third-party electronic clearing houses, back office processing outsourcing and restructuring of branches are some of the possible alternatives.

The attributes and certainty linked to the cheque have prevailed for a long time and have helped build confidence in its use, besides the legal protection they entail.

2. The use of electronic payment media

2.1 General considerations towards a change in strategy

2.1.1 At the banking sector level

One of the ways the banking sector has found to increase the "banked population"[20] and to become incorporated into global technology has been the automation of services through electronic means, focusing efforts on the development of e-commerce (network use), its optimisation and the implementation of new electronic banking (internet banking) services.

One of the reasons that led banks to make huge investments in the updating of computer platforms, security mechanisms and ingenuity in product supply has paradoxically been the need to increase the transactions efficiency level and consequently reduce costs.

Services have traditionally been concentrated in bank branches that offer customers numerous services, products, credits and deposits at a high operational cost as a result of the maintenance of a physical presence and the business units (front office) and operational units (back office) devoted to the personal service of the customers.

The behaviour of the productivity index as measured through the transformation costs/assets ratio, the deposits/number of bank branches ratio and the deposits/employees ratio has been another reason pointing to the change in strategy. Besides, the narrowing of margins, which in part is the result of price stability reached by some countries or their bearish trend, has fostered the search for "new ways of banking" in order to maintain or increase the risk capital level demanded by supervisory authorities as well as the return on the capital invested by stockholders.

[20] The share of the economically active population having at least one banking product.

Other factors that have helped boost digital transactions are competition, globalisation, the opening-up of alternative distribution channels, the improvement in services and the search for customer loyalty.

In environments with low "banked population" levels, high unemployment rates and low or inexistent economic growth, the massive incorporation of all market participants would seem less probable.

2.1.2 Globalisation and technology

New information technology and its specific applications in the area of payments have facilitated the innovation of products and payment services and consolidated market globalisation.

The need of the financial industry for expansion into new markets, the competition in the banking sector and the rapid internationalisation of banks have called for the supply of new products and services equivalent to those in place in the most developed markets, where information technology is a key element.

2.1.3 Banks' users

From the customers' standpoint, the factors influencing the use of electronic services, instruments and payment means versus the cheque include:

– Competition for alternative distribution channels versus the traditional ones.

– Rapid crediting of funds and transaction expediency.

– Product pricing.

– Advances in the application of information technology. The digital culture attracts younger people, who paradoxically are the ones that contribute less to the system.

– Receptiveness to publicity and interest in the follow-up products.

– Supply consistency, enabling consolidation of the change in the market.

2.2 Final considerations

Based on the foregoing, it may be considered that we are facing a rapid and unstoppable reform of the payment systems with the introduction of new payment instruments characterised by information technology.

It is similar to past reforms in that they have always come from the financial sector, mainly grounded in factors related to the behaviour of costs and competition.

Central banks and authorities in charge of supervising the financial system must define their roles during and after reform, in an environment that at present lacks regulations and a legal framework, as well as "robust" certainties covering pending or undefined risks, and given the uncertainties that surround reforms that are still in the future or in very early stages.

The reform has commenced and it demands that all participants make great efforts so as to be equal to the present challenges and incorporate technological changes.

3. New electronic services, instruments and payment media

3.1 Expectations and trends

3.1.1 In retail banking

Apart from the need to accommodate market developments, the justification for investment seems to be based on expectations that should materialise quickly in order to achieve the desired returns:

– To change the banking distribution channels (branches) concept and increase the use of electronic payment media.

– To migrate traditional operations (cash, cheques, ATMs) to electronic transactions.

– To increase trading volume and banking products consumption.

– To enhance funds turnover.

– To eliminate or minimise the use of cash.

– To offer secure and suitable payment media.

– To facilitate transactions in foreign currency.

– To transact independently of the place of execution.

– To introduce new lines of business.

– To reduce transaction costs.

– To make the service more widely available.

– To change or modify consumption patterns.

– Adequate acceptance infrastructure (points of sale).

3.1.2 New participants

Participation of all players is crucial: major payment generators that are translated into retail transactions are the government, the public sector in general, corporations with a high volume of retail sales and utilities.

In countries such as Colombia and Costa Rica, the automation of payment orders (credit transfers) from the government sector (the National Treasury) is a fact. Likewise, Bolivia is developing the automated transfer of government payments.

Benefits are manifold:

– For the central bank, better implementation of monetary policy and injection of money into the economy.

– For participants in the financial system, better planning and availability of flows of funds in their natural market, the interbank market.

– For end users, quicker account crediting.

– For the payment system, higher funds turnover.

– Tax collection by the government and income declaration through the internet in some countries have evolved from idea to reality (for example in the United States). This will enable progress in the search for efficiency.

– The electronic presentment and payment of bills links big utilities with consumers and banking institutions.

3.2 Deterrents to the use of electronic media and services

Deterrents to the use of electronic payment media are mainly related to risks that, in many people's opinion, are still awaiting resolution.

– Operational risks: business continuity and capital legitimacy ("know your customer policy").

– Risk of fraud.

– Legal risks.

– Credit risks.

Other factors of equal importance generating mistrust in users of these payment media are:

– Access to technology; rapid changes.

– Pricing policy in relation to investment return time.

– Volume of traded operations necessary to make the access cost lower than that of teller consultations.

– Operational risk control.

– Computing services availability.

– Availability of quick response call centre services.

– In the case of banking users, the seriousness/frequency of fraud and the lack of appropriate answers cause a feeling of lack of protection in clients and create mistrust of these payment media.

– The cultural environment, the fear of innovation, the level of literacy of the population and purchasing power are also factors in the generalised used of the cheque versus innovations in payment means.

3.3 Final considerations

The widespread adoption of electronic payment media and the migration of transactions from conventional means will greatly depend upon the resolution of issues specifically related to the service and the establishment of distribution channels guaranteeing security in funds manipulation.

In some cases, the discussion as to whether payments are made in local currency or in US dollars according to the legislation applicable to the currency system is still in progress.

The resolution of claims and the form of the final settlement (among financial participants or at the central bank) are also issues awaiting resolution.

A complete legal framework covering the rights and obligations of all the parties involved in a transaction, the protection of the final user and general application principles are issues that should also be addressed.

On the other hand, the evolution of economies, the level of working population and the development of real income influence the steady incorporation of new users and will influence the evolution of the payment systems.

4. The tenacity of the cheque and the role of the clearing houses

In the first place, the payment system comprises the set of participating economic agents that trade under payment arrangements that differ depending on the markets in which they operate and under the rules and regulations that support them.

To operate in an orderly fashion, they must adhere to a certain structure under which each participant must be clear as to the role to be played and the rules that must be respected.

This hierarchy of participants is closely related to the operational model, the technology, the characteristics of the financial system and the legal framework, and is also linked to market practices, the prevailing trading mechanisms and its own patterns.

As a result, new ways of doing things impact heavily on the "culture" of the market and its participants.

It seems, then, that reforms must undergo stages that may not be skipped in spite of being considered obsolete in other environments. It is difficult to think that countries where the reform of low-value payment media is a recent undertaking will adopt new forms of payments immediately without first adapting the present situation.

In effect, the ***non-banking economic agents***, represented by the general public and accounting for most of the economic and financial trades executed in every market economy, need to assimilate new

concepts, change behavior patterns by replacing the banking teller, eliminate "paper-based" culture and incorporate technology; they want certainty as to their payments.

Banks as issuers of payment instruments and services (cheque-ATM), and as suppliers of cash and funds transfer services for customers must also assimilate the new culture, guarantee the continuity of the process, get used to quicker funds turnover speed and accept the challenge that the service and the competition with virtual banks is what matters, and not the brand.

The ***intermediary institutions*** (clearing houses) that facilitate the transfer of deposits among banks must also accustom themselves to changes.

The ***central bank*** as the agency responsible for the operation of some clearing systems, the effective transfer of deposits and the closing of the payment cycle, including delegated or private sector payment systems, must adapt its role regarding supervision and oversight of the system to changing circumstances.

Based on the above considerations, it seems that the maturity of participants, the assimilation of changes, the ordered development within an adequate regulatory and operational framework, the clear role of the central bank and its responsibility for the payment systems can only be achieved by completing the stages that most developed countries have already undergone in the development of payment systems.

5. The Venezuelan payment system and the use of low value means of payment

5.1 Payment system reform

Issues related to the Venezuelan payment system have long been focused on the operational environment.

The subject has gained importance on account of:

– The interbank money market volatility and segmentation.

– The appearance of risks inherent in high-value transfer systems, specifically in the clearing and settlement stages.

– The advent of new participants: since 1996, foreign banks in the system have accounted for approximately 57% of total deposits.

– The demand for better payment systems by corporations and consumers.

– The integration with international markets, necessitating adoption of international standards as to the handling of payment media.

– The contribution of information technology and the facilities created by the electronic transmission of information.

As a consequence, on 22 July 1999, Resolution No 99-07-01 was published in the Official Gazette containing the Rules of the Advisory Committee on Payment System Reform. This Resolution assigns the coordination of the reform to the Central Bank. Low-value payment media were given priority and the operation continues to be in the hands of the Central Bank of Venezuela.

5.2 Traditional payment media

The Venezuelan payment system is based on cash and cheques, with electronic media at an early stage of development.

Cash is dispensed through "taquillas" and is complemented by a network of ATMs that operates by means of access cards.

Both the banking sector and the public in general consider the cheque as the primary way of clearing and settling transactions.

Banks have developed proprietary guarantee systems for payments by cheques, via telephone approval 24 hours a day.

The principal low-value payment instruments are:

5.2.1 Cash

A large proportion of payments to individuals are made in cash, especially in the areas of retail trade, ground transportation and personal services.

Cash is usually dispensed over bank counters. As a complement, the banking sector has developed a network of ATMs that operate by means of access cards.

The networks are interconnected so as to enable the exchange of payment services both within the country and with international networks.

Over time, cash in the hands of the public as a component of monetary liquidity has developed as shown in the following table:

Percentage shares

	1999	**1998**	**1997**	**1996**
Cash/M2	14	12	11	10
Demand deposits/M2	34	35	41	36
Savings deposits/M2	30	31	34	37
Term deposits/M2	22	22	14	18

Source: Central Bank of Venezuela.

The behaviour of cash during the period 1996-99, as measured by the cash/monetary liquidity ratio, evidences a growth in its use.

This may have been influenced by the expansion of the informal economy, where transactions are made primarily in cash, and by the introduction of the banking debit tax (0.5% of each debit) since 15 May 1999.

5.2.2 Cheques

Cheques are the primary means of payment. Universal and commercial banks and, most recently, savings and loans institutions are authorised to offer deposit accounts that may be operated through cheques.

Their acceptance by the public has been strengthened due to the boost banks have given to approval services, the rules of security related to cheques themselves and guaranteed cheques.

Cheque processing for the purpose of settlement in favour of the beneficiary has incorporated improvements intended to increase automation. In the future, processing will be executed through an electronic clearing house.

The use of cheques has been influenced by events that are not necessarily related to payment media.

	1999	**1998**	**1997**	**1996**
Volume of transactions (thousands)	112,360	137,130	129,946	111,690
Value (USD millions)	161,798	198,019	167,481	94,359

Source: Central Bank of Venezuela.

Banks offer private and corporate customers a growing range of facilities for cheque utilisation.

Benefit	Incentive for cheque use
Issuers	Cheque book dispensers Remunerated current account Electronic funds transfers at no charge Standing orders Chequebook Lower rates and commissions
Users	Automatic approval per operator Availability in T+2 Cheque deposits in any marketplace Cheque collection offices availability Cheque deposits in mailboxes/ATMs

5.3 Use of electronic media

Electronic commerce and the introduction of alternative channels to traditional payment media have developed slowly in Venezuela.

5.3.1 ATMs

The use of the ATMs dates from 1984 and they are operated through two networks developed by banks. They are interconnected so as to enable the exchange of payment services both within the country and with international networks. A total of 3,661 ATMs (are in use as at December 1999) but the number per million inhabitants (148) seems low when compared to other countries.

ATMs/million inhabitants

Japan	1,115
Spain	962
United States	616
Europe	489
Chile	157
Venezuela	148
Mexico	140
Colombia	132
Argentina	119
United Kingdom	93

Source: Venezuelan Banking Association.

Transactions executed by users are few compared to other means of payment. Some of the reasons for this may be the policy of cash supply, which does not include notes of high denomination, the risk of fraud, the time elapsed before a claim is settled and the number of debit cards in the public's hands.

5.3.2 Credit cards

They are a complement to the cheque, given the comfort and speed of payment processing and the financing facilities related to them.

There is a network of affiliated establishments with online processing through direct communications between the network and the authorisation centre.

They are used for standing orders and to supply cash, offering an alternative to the cheque. Distribution and holding have spread but usage has diminished.

	1999	1998	1997	1996
Amount (USD millions)	2,936	3,222	2,265	1,140

Source: Central Bank of Venezuela.

5.3.3 Debit cards

These are being introduced into the market only slowly in spite of banks' efforts. They require affiliation by establishments and points of sale.

According to recent data, only 40% of current and savings accounts are associated with a debit card.

5.3.4 Prepaid cards

These were introduced in 1999 by telephone companies, especially cellular phone companies, and have gained wide acceptance in the market.

5.3.5 Electronic commerce

The greatest boost was given at the end of 1999, when the concepts of malls and virtual shops appeared. These have been developed on the model of a local traditional shop, at competitive prices and eliminating stages in the commercial chain.

Services are geared to particular-user profiles. Thus, their use is not extensive.

Payments are made through credit cards and in the future some payment services will include authorised cheques, debits from deposit accounts and the use of a debit card.

The market is in its initial stages and at present the necessary alliances are being formed (communications providers, banks, distribution, suppliers).

5.3.6 Electronic purse - Travel Money: pilot project

Its introduction has commenced this year.

The object of the electronic purse is to eliminate the use of cash (low-denomination notes and coins).

The card operates by means of an incorporated microcircuit. It may be used and loaded with cash at terminals or by the transfer of funds to and/or from bank accounts or personal credit facilities.

It is intended for individuals and establishments with high volumes of retail sales and individual sales below USD 15.

As to the so-called Travel Money, it works as a card that may be used to withdraw cash in the currency of the country where the transaction is executed.

5.4. New products

In the future, the following products and services will be developed:

– Electronic cheque clearing house.

– ACH: standing orders, receipts of payment, lists, bills of exchange.

– E-commerce: B to B (business to business),
B to C (business to customer).

– Wireless web technology: web phone,
e-cash.

- E-wallets.
- Online currencies.

5.5 Final considerations

The activities undertaken by financial institutions in connection with electronic banking may be considered as incipient.

The initiative stems from a few banks, and the services offered are mainly informative and not transactional. Internet banking is mostly used by corporate customers, a segment where banks mainly introduce changes.

Retail banking envisions a great opportunity to reduce costs in so-called virtual branches but it must not be forgotten that this is a "traditional" banking sector with a significant number of branches (3,028) compared to the size of the "banked population".

The banking sector must face certain challenges:

– to become familiar with internet customers;

– to change the operation of traditional branches, entailing great efforts to change consumption habits of banks' customers;

– to build confidence;

– to define standards in all aspects related to electronic banking, according to the characteristics of the country, the investment in technology; and

– the assimilation of the culture by banking institutions in an environment where access to technology and IT knowledge among the population are limited.

6. Conclusions

As to the cheque:

– Like other payment instruments, the cheque will coexist with new products to be developed and will remain as a complement to other instruments within the payment system.

– Its use and acceptance at the beneficiary level has led to the optimisation of associated processes, the creation of services companies specialised in processing and intensive investment in support technology.

As to distribution channels:

– Banking institutions will keep their traditional branches, which will coexist with "virtual branches" and will continue to be an important distribution channel for all products and services. They will adjust their capacities to the needs of consumers that still consider valuable the direct relationship with the bank.

As to clearing houses:

– These are central institutions providing services of electronic payment instructions processing (cheques, credit and debit transfers).

– Over time, their services in the region may be extended to other sectors such as insurance, settling the claims between different insurance companies (Cámara de Compensación de Siniestros de Automóviles en España).

– They are allies to banking institutions and valuable intermediaries for the Central Bank.

– They must acknowledge the need to innovate so as to meet challenges such as the incorporation of so-called "electronic bills".

– They are participants in the payment system of countries that have undergone reforms.

– They may turn into institutions that support the trade[21] liberalisation process.

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Financial Synthesis

[21] Decision 439 of the Andean Community (CAN) provides for the liberalisation of intra-subregional trade, including financial services, for the year 2005 at the latest. This is leading CAN member countries (Bolivia, Colombia, Ecuador, Peru and Venezuela) to sign agreements on international payment and transfer arrangements for current and capital account transactions.

Real-time gross settlement system of the Central Reserve Bank of Peru: LBTR
Félix Germaná Matta, Head of the Payment Systems Department, Central Reserve Bank of Peru

Firstly, let me introduce the Peruvian payment system, where 75% of liquidity is in American currency, even though in terms of payment flows the share of the domestic currency is slightly greater. Another fact is that the domestic currency reserve requirement is lower than the reserve requirement for deposits in US dollars (40% approximately).

Because of that, commercial banks are usually short in their current accounts in soles at the Central Reserve Bank of Peru (BCRP), while they have surpluses in their foreign currency (dollar) accounts. The LBTR system attempted to introduce real-time rules considering the Peruvian bi-monetary reality.

An efficient payment system is required to ensure an appropriate economic growth process, and the ***speed and finality*** of funds transfers are key elements. The LBTR system reduces the probability of a situation in which a participant cannot meet its obligations and thus eliminates the central bank settlement risk. Therefore, the LBTR's objectives are:

- to strengthen monetary policy;
- to reduce moral hazard in the banking system;
- to increase payment system efficiency;
- to increase confidence in the domestic currency;
- to increase banking services in the economy;
- to eliminate systemic risk in large-value payments;
- to eliminate the central bank settlement risk.

Now, I am going to give a brief chronology of the LBTR's development and describe its main features. At an earlier stage (1996), the BCRP introduced a communications network with the commercial banks, called SIB, which enabled the banks to have at their disposal information regarding the balance and movements of their accounts. Simultaneously, a first diagnosis about the Peruvian payment system was made and a technical mission of the IMF, which arrived later in August 1997, recommended the introduction of an RTGS system for large-value payments. In May 1998, the BCRP took the decision to promote such a system, and then we worked on the development of the system and tested LBTR with the banks throughout 1999.

After that, the BCRP issued the LBTR's regulations and the system began operation in February 2000. With regard to the main features of the system, basically the LBTR consists of a set of programs (software) developed by the BCRP to process and record individual funds transfers as they occur through a network (SIB) which links the banks with the BCRP. The LBTR system is the only official channel to debit and credit the current accounts that the financial institutions hold at the BCRP through both online transactions and offline transactions (using faxes) for non-banking institutions. The system offers immediate finality and transfers of funds are irrevocable once debited from the sender's current account and credited to the receiver's current account.

Also, the LBTR allows transfers in both domestic and foreign currency, as did the previous manual system, permitting also both interbank and customer transfers. Transfers on behalf of customers must be no less than USD 15,000 in the case of foreign currency transfers and PEN 50,000 in the case of domestic transactions. Finally, all the operations have an intraday collateralised credit facility in order to smooth operations.

Regarding the technical design features, the LBTR has a V-shaped message flow structure. In other words, the full message with all the information about the payment is transmitted from the sender bank

to the BCRP's computer for processing; from that point the message is sent automatically to the receiver bank. Before this change, the structure was T-shaped, which meant that the sending bank had to send faxes both to the BCRP and to the receiver bank.

Another characteristic is that it is necessary to use a logon ID and a password in order to access online transactions while security procedures inside commercial banks are managed by the banks themselves. The LBTR allows funds transfers provided the participant has funds or intraday credit fully collaterised. The intraday collateral is the same as that used in the BCRP's overnight credit facilities; it consists mainly of US dollars and Central Bank Certificates. Additionally, the LBTR has a "bypass FIFO" queuing mechanism. The LBTR has introduced a new tariff scheme based on transaction volumes, each transfer costing approximately USD 2 before 3.30 pm and USD 3 after 3.30 pm; additionally, there is a monthly charge of USD 200 for online participants. This scheme replaces the previous ad valorem scheme for transfers in foreign currency (0.02 % of the transfer amount with a cap of USD 100 and a floor of USD 15) and no charge for domestic currency transfers.

During the first three months of operation, the system led to an increase of 25.3% (from December 1999 to April 2000) in the payment services managed by the BCRP and we have observed a change in the share of the use of payment instruments: cheques fell from 36% to 17% and transfers increased from 64% to 83%. That behaviour could be explained principally by the fact that banks now do not need to use cheques to avoid the previous ad valorem charges for transfers in US dollars.

Finally, I would like to mention the fact that generally a RTGS system implies a trade-off between operational efficiency and risk control, RTGS systems usually requiring more liquidity than net settlement systems, and participants have to immobilise liquid assets as collateral for intraday credit. However, in the Peruvian case, LBTR implementation did not imply a reduction in efficiency because of the relatively low level of daily transactions (USD 875 million) and the high level of reserves in foreign currency which are partially used as collateral for intraday credits. In that sense, we have a fluid system without significant losses in operational efficiency.

How can banks obtain collateralised intraday credit in the SIC system?
Daniel Heller, Head of Payment Systems, Swiss National Bank

In October 1999 the Swiss National Bank (SNB) began to offer intraday credit to the participants in the Swiss Interbank Clearing System (SIC). Intraday credits are granted in the form of repurchase agreements (repos). The SNB uses the same platform for intraday credits as for its standard monetary policy repos. No interest charge is applied to intraday credits, but the participants have bear the transaction fees. The SNB's intraday facility is open to all SIC members.

While SIC has been working smoothly without intraday credit since its inception in 1987, an increasing need for time-critical payments led to a change in the SNB's policy. For instance, banks settling their foreign exchange transactions through the CLS-Bank will have to follow a strict pay-in schedule. Against this background, the liquidity risks would increase substantially without intraday credit.

For the time being, intraday credits can be drawn twice a day; at midnight (in SIC settlements for a given value day begin at 6 pm the evening before) and then at 8 am. Payback is automatically triggered at 3 pm, which is one hour before the system closes. It is planned that by the time the CLS-Bank goes live, the SNB will offer intraday credits more often or even continuously throughout the day. A haircut of 10% is applied to every intraday repo. Participants can choose between two baskets of collateral; one with Swiss and another with German paper. For intraday credits that are not repaid by the end of the day, the SNB charges a penalty that is 400 basis points above the overnight rate. This penalty is twice as high as the one for a standard lombard credit.)

In January 2000, intraday credits were drawn for an aggregate daily amount of CHF 1.8 billion, while the average end-of-day balances in SIC were CHF 3.1 billion. On average, eight intraday credits were granted per day, ie the vast majority of the SIC participants are not (yet) using this facility. Due to a

distorted liquidity demand around the century date change, it is still too early make an assessment of the impact of intraday credit on the overnight balances held with the SNB.

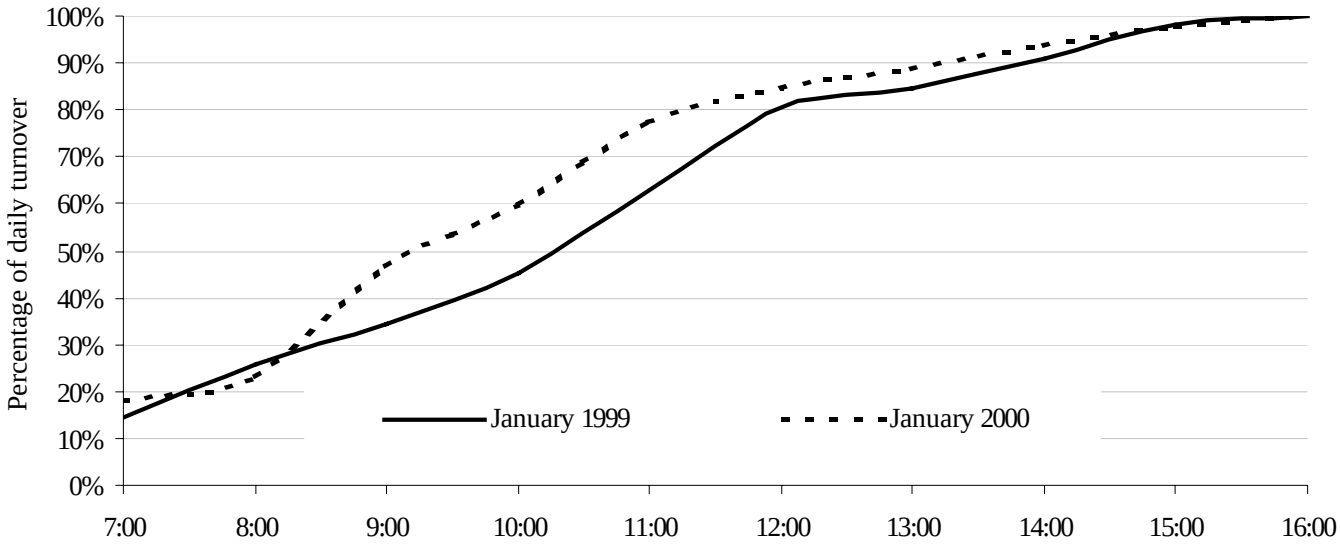
Graphs 1 to 3 show the effect of intraday credits on the settlement process in SIC. The comparison is based on data averaged over all business days for the months of January 1999 and January 2000. On the horizontal axis, the time of the day is shown until 4 pm when the system closes. The vertical axis depicts percentages of daily turnover (value). Graph 1 illustrates the time at which payments are sent to SIC. In January 1999, somewhat more than 30% of the daily turnover was sent to the system by 9 am. At the same point in January 2000, almost 50% of the daily value was transmitted. Hence, the introduction of intraday credit led to a change in the behaviour of the participants. Payments are now entered into the system earlier. From a risk point of view, this is a very encouraging outcome.

Graph 2 compares the size of the queues. At 9.00 am the queues were larger in January 2000 than the year before. This is due to the fact that the payments are now transmitted to the system earlier (see Graph 1). After 11 am, however, the situation changes. The queues are currently much smaller than they used to be. At 3 pm settlement is now almost completed while in January 1999 about 25% of the daily turnover was still queued. The reduction in the size of the queues is also reflected by the time that the average payment is queued. In January 2000, the average payment spent 21 minutes in the queue before it was settled, a year earlier it was 40 minutes.

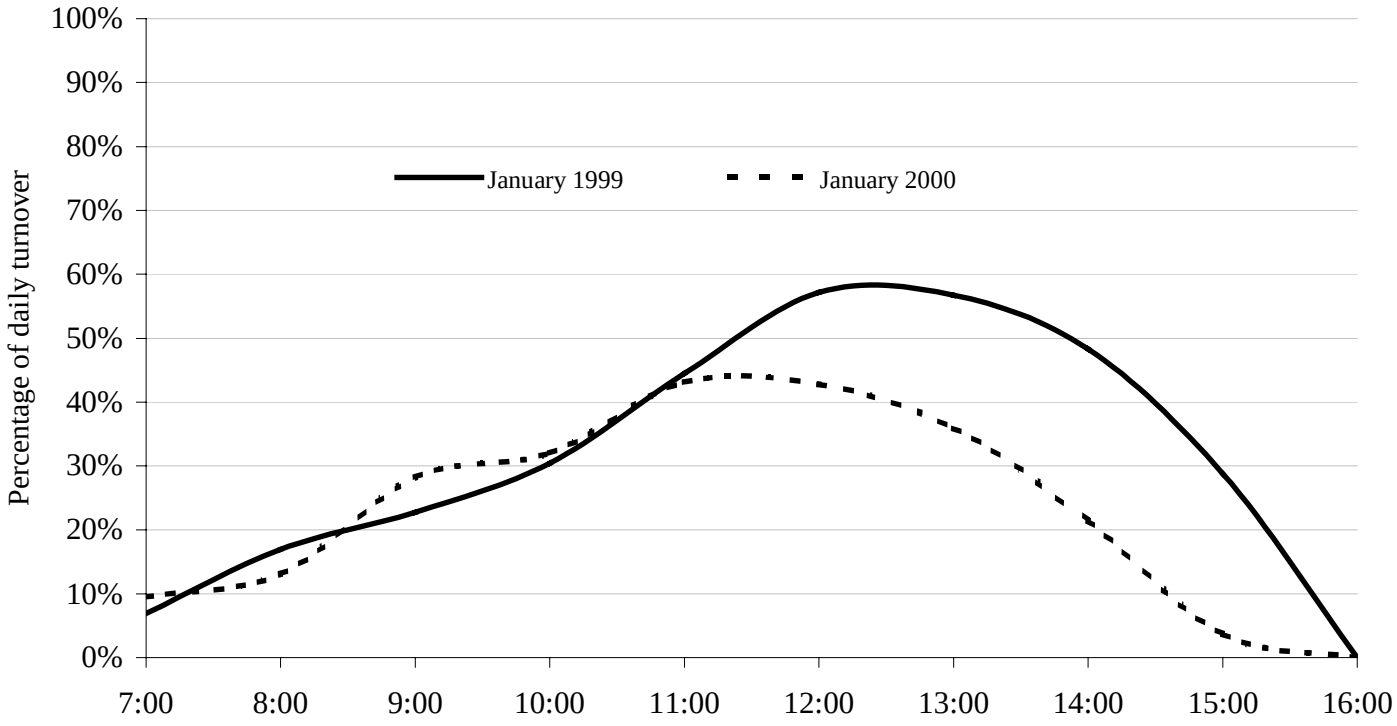
Finally, Graph 3 looks at the evolution of final settlement during the day. Before 8 am no change in the settlement pattern has occurred. Afterwards, settlement proceeds more quickly now. Around noon almost twice the amount is settled.

Looking back over the first few months with intraday credit we can say that the demand has not been overwhelming, especially with respect to the number of participants. This is, however, not surprising, since at the currently low level of short-term interest rates the gains from using intraday credit are only modest. Moreover, some important banks tend to be constrained by the liquidity requirement regulation, which means that they cannot save money by reducing their reserves held at the SNB. Due to a positive trend, in terms of both the number of participants and the total amount of drawn intraday credits, the new facility is now slowly growing in popularity.

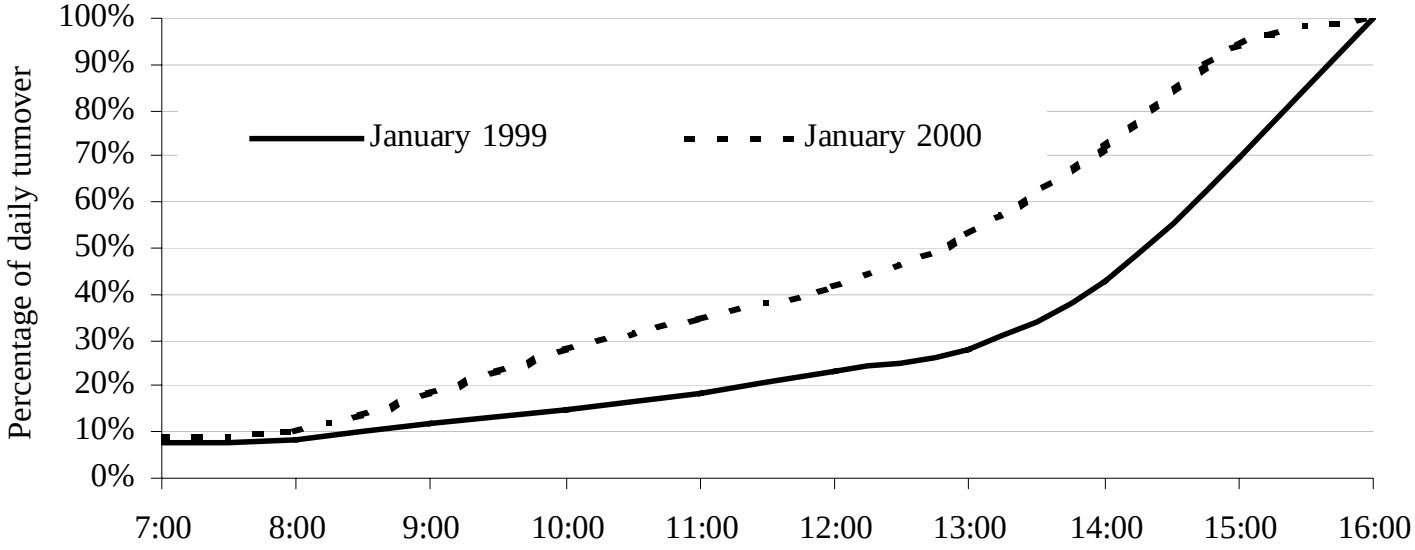
Graph 1: Entered payments



Graph 2: Pending payments



Graph 3: Settled payments



The oversight of S.W.I.F.T.
Johan Pissens, Oversight Team, National Bank of Belgium

Introduction

A central bank's concern with the security and stability of the financial system in general is based on several factors. It is not based on any micro-prudential consideration (these are taken care of by the banking supervisors), but it is related to the fundamental tasks of a modern central bank, and to its concern about the effectiveness of its monetary policy. A stable and efficient financial system in which the systemic risk[22] is kept to a minimum naturally assists a central bank in achieving the timely and transparent implementation of monetary policy. As the lender of last resort for credit institutions, a central bank is directly involved once systemic risk threatens to materialise, since it will be called upon to provide liquidity in crisis situations. From this point of view as well, the prevention and control of systemic risk is important for the central bank.

To ensure the security and stability of the financial markets, central banks have already adopted a number of measures over the years (given the international dimension of financial markets, most of these measures were taken internationally – often by the G10[23]); examples include the introduction of statistics for monitoring the markets and increasing their transparency; improvements to market practices (such as encouraging spontaneous disclosure by market participants); and *last but not least, the involvement of the central banks in payment systems*.

The central banks have since long recognised the crucial and fundamental role of payment systems in maintaining the stability of the financial markets and confidence in the currency. To ensure that payment systems are designed in such a way as to minimise the systemic risk and to maintain confidence in the payments systems, central banks have broadly speaking taken two types of action:

– designing/organising/operating payment systems themselves;

– oversight of other payment systems (ie those in which they are not themselves involved as the designer/operator, etc).

This is also reflected in the recent consultative paper on the core principles for systemically important payment systems, where special attention is given to the central banks' responsibilities in this domain and where four Central Bank Responsibilities are distinguished. More particularly Central Bank Responsibility C is relevant here: "The central bank should oversee compliance with the core principles by systems it does not operate and it should have the ability to carry out this oversight."

Motivation for the oversight of S.W.I.F.T.

S.W.I.F.T. is not a payment system as such; it is a cooperative society, established in Belgium, its main activities are to provide a secure network and to provide standardised messages (payment instructions, confirmations ...) to its members/clients. The access to S.W.I.F.T.'s services is restricted to specific categories of financial institutions. The reasons for central banks to be active in the oversight of S.W.I.F.T. is based on S.W.I.F.T.'s paramount importance for payment systems, S.W.I.F.T.'s role becoming that crucial and widespread that dysfunctions or weaknesses at S.W.I.F.T. might create systemic disturbances.

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22 Systemic risk occurs when problems in one financial institution have such a great impact that they spread to other institutions and thus cause a general financial crisis.

23 The G-10 consists of Belgium, Canada, Germany, France, Italy, the Netherlands, Japan, the United States, the United Kingdom, Sweden and Switzerland.

Internationally, it is a generally accepted principle that the intention is absolutely ***not*** that the central bank should grant any system certification or approval; moreover, the system operators continue to bear primary responsibility for the security and efficiency of the system concerned.

The legal basis of the oversight activities by the National Bank of Belgium

The legal basis of the current oversight by the National Bank of Belgium (NBB) is provided in Article 8 of its new Organic Law. This article reads as follows:

The Bank shall ensure that the clearing and payment systems operate properly and shall make certain that they are efficient and sound. It may carry out all transactions or provide facilities for these purposes. It shall provide for the enforcement of the regulations adopted by the ECB in order to ensure the efficiency and the soundness of the clearing and payment systems within the European community and with other countries.

This responsibility covers both cash settlement systems and securities settlement systems, as may be seen from the Explanatory Memorandum*: "This provision … gives the Bank responsibility in supervising payment systems and the clearing of securities, …"*

The oversight arrangements at the National Bank of Belgium

The National Bank of Belgium itself operates a number of systems: ELLIPS (the Belgian Real-Time Gross Settlement (RTGS) system), UCV (the retail payment system) and the NBB clearing system (the clearing of government securities).

The Bank also has a commercial relationship (as competitor or customer) with most of the systems which are subject to its oversight.

To avoid any form of conflict of interests, the oversight activities were therefore strictly segregated from the operational activities (Chinese walls). This hierarchical and functional segregation between oversight activities and operational activities was carried to the highest level at the Bank: a member of the Board of Directors who has no responsibility for operational activities is in charge of oversight. In practice, the oversight activities are carried out by an Oversight Team forming part of the International Co-operation Service.

Specific arrangements for the oversight of S.W.I.F.T.

The international dimension of S.W.I.F.T.'s activities is reflected in the oversight arrangements that have been set up. The National Bank of Belgium acts as lead overseer and is supported by the G10 central banks. This implies that the National Bank of Belgium, while being the prime oversight authority of S.W.I.F.T., is supported in this oversight by the G10 central banks, within the context of the CPSS. The CPSS also acts as the forum where more general, longer-term issues such as the oversight policy vis-à-vis S.W.I.F.T., or the results of the oversight activities are discussed.

These arrangements are very well accepted by S.W.I.F.T., S.W.I.F.T. is also transparent on them. On its website S.W.I.F.T. describes its relations with its overseers as follows: *"S.W.I.F.T. is committed to an open and constructive dialogue with regulatory authorities. The National Bank of Belgium (NBB) has a co-ordinating role (on behalf of central banks) through the G10 Committee on Payment and Settlement Systems (G10/CPSS). S.W.I.F.T. has been in regular contact with the G10/CPSS, the Bank for International Settlements and individual central banks, including the NBB. The issues discussed include the audit process, the independence of the external security auditor and the security and reliability of S.W.I.F.T's network. The CPSS have been updated on key elements of the next generation*

programme and have advised that they wish to proactively monitor the implications of these developments."[24]

The use of collateral for monetary policy purposes and for the provision of intraday liquidity in Colombia
Joaquín Bernal, Vice President of Banking Operations, Bank of the Republic[25]

The Bank of the Republic (BR) uses collateral to guarantee and enhance the safety of operations aimed at providing liquidity in the economy. Collaterals are required both for open market operations (OMOs) which have been the basic element in conducting monetary policy by indirect instruments since 1997 and for intraday repos, implemented by the BR as a source of additional liquidity to smooth the operation of the large-volume payment system, which has been based entirely on the principle of real-time gross settlement (RTGS) since 1998.

A modern, sound and reliable infrastructure is required to implement a collateral-based monetary policy. With this in mind, the BR has administered the Central Securities Depository (DCV) for public debt instruments since 1992. The DCV has operated under the delivery-versus-payment (DVP) principle since 1992 and has operated under RTGS since 1998. An electronic trading system (SEN) for public debt instruments was established in December 1998, which has contributed to the liquidity in that market and to a greater transparency in the generation of reliable benchmark prices.

These topics are discussed in this paper, which consists of three sections. Section I evaluates the Colombian experience with the use of collateral to manage monetary policy and how it operates at present. Section II illustrates the way collateral is used to guarantee intraday repos, and Section III discusses the importance of the operational infrastructure.

I. The use of collateral to manage monetary policy

A. Operational aspects and the current situation

The BR currently absorbs or provides overnight or short-term liquidity (maximum 15 days) through repo or reverse repo auctions and an end-of-day standing facility ("window") at a higher interest rate (lombard). It conducts daily, weekly and biweekly repo auctions using a uniform price method. While the auction has a predetermined amount set by the CB, the standing facility is limited only by the amount of acceptable collateral submitted by the intermediary. Full collateralisation exclusively with public debt instruments administered by the DCV is required for all these operations.

The instruments are received at their present net value[26] and the following haircuts are applied: 97% for foreign currency central government (CG) debt instruments, 95% for treasury bonds issued by the CG (TES-B), 93% for Finagro (Agriculture Development Fund) bonds placed at a discount, 90% for Fogafin (Deposit Insurance Fund) and other CG and Finagro bonds. These haircuts are an inverse function of the liquidity of these securities on the secondary market.

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[24] Source: http://www.swift.com/general/pages/gov.htm , last paragraph

[25] The author is grateful to Luis Eduardo Arango and Bertha Briceño for their assistance and to Patricia Correa and Orlando Márques for their comments.

[26] Discounted at the TES rate of return on the secondary market or the average 90-day deposit rate (DTF) offered by credit institutions, according to the type of security.

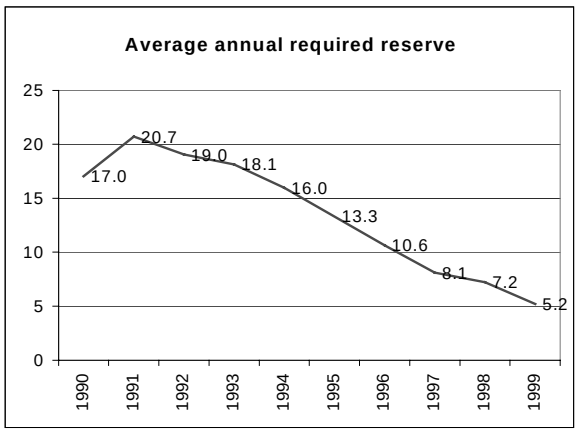
The regulatory framework also permits the BR to undertake outright purchases of government securities (TES) on the secondary market. This is done either via a uniform price auction or through the SEN.

There are more than 200 authorised dealers, including commercial banks, other credit establishments, stockbrokers, institutional investors (fiduciaries and private pension funds) and other intermediaries. An intermediary who has been assigned an auction or resorts to the standing facility transfers his securities to an account in the name of the BR (and, thanks to the DVP principle, simultaneously receives a credit to his account with the BR).[27] The funds received must be returned before 2.30 pm on the payback date in order for the intermediary to get back the same securities. Towards the end of 1999, a "rollover" of repos was authorised in order to reduce pressure on the interbank interest rate. Thanks to this, a repo may be renewed automatically, provided it is backed with the same collateral as the repo due on the same date (and only if the Front Desk has previously approved the intermediary's request for a new repo).

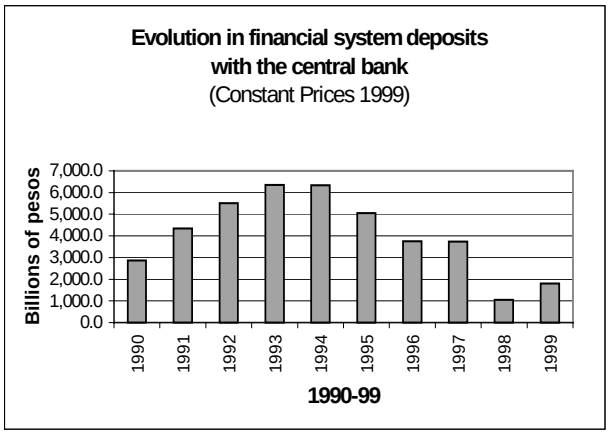
B. The Colombian experience in the 1990s[28]

Up until the early 1990s, monetary management in Colombia depended largely on the use of mandatory reserve requirements. In the second half of the 1990s, the BR took up the challenge of conducting monetary policy primarily on the basis of indirect market instruments, through OMOs against public debt securities (repos and outright purchases of government securities).[29] Thanks to considerable progress on this front and to a radical change in macroeconomic conditions, the average reserve declined from 20.7% of the value of demand and time deposits in 1991 to 5.2% in 1999 (Graph 1). The latter is comparable to the percentage in countries with a similar level of economic development. Thus, the function of the reserve requirement is now precautionary, as a liquidity cushion in the event of a run on deposits.

Graph 1



a) Average reserve



b) Evolution in deposits

[27] Intraday repos operate in a similar way, as illustrated in Section III.

[28] See Correa (2000) for a more in-depth and comprehensive analysis of the ideas presented in this section.

[29] In fact, contractionary operations were conducted up to 1997 against central bank's securities (TPs), while TPs also were accepted for expansionary operations up to 1998, in addition to public debt securities.

A 1993 law[30] stipulated that, as of 1999, OMOs must be conducted only with public debt securities. The BR began to prepare for this eventuality in 1997 and was compelled to initiate TES-B purchases in amounts that would allow it to accumulate a sufficient stock for its contractionary operations one or two years later.

Initial implementation of the collateral-based monetary policy and its evolution in these three years coincided with one of the most turbulent financial and macroeconomic periods in the country's history, which caused tremendous difficulties. The BR also had to maintain a difficult balance in order to comply with this mandate without favouring fiscal debt financing through public debt purchases on the secondary market. The mechanisms adopted to prevent this effect are discussed later.

The supply of collateral - in our case public debt securities - has been determined, in part, by the growing fiscal imbalance, which largely explains the growth in the stock of central government (CG) debt from 15.8% of GDP in 1992 to 29.6% in 1999, as well as by the CG strategy of promoting domestic financing of the deficit and developing the public debt market, thereby reducing traditional dependency on external financing, which helps explain why the stock of CG domestic debt rose from 6.4% of GDP in 1992 to 14.7% in 1999. Table 1 shows the evolution and composition of domestic debt securities administered by the DCV, which are acceptable as collateral for OMOs. The most important among them are CG's treasury bills (TES-B), Finagro's TDA and the bonds of the Deposit Insurance Fund (Fogafin), which only began to be issued in 1999.

Table 1

Evolution of stock of public debt securities in circulation, 1992-2000

(Billions of pesos)

Security	1992	1993	1994	1995	1996	1997	1998	1999	March 2000
TES-B	290	982	2,091	3,864	5,897	9,614	13,856	20,100	22,562
Fogafin/1	–	–	–	–	–	–	531	3,735	4,675
Finagro/2	365	441	662	933	1,055	1,220	1,823	1,930	1,910
Others/3	140	120	103	184	149	552	608	845	857
Total	795	1,543	2,857	4,981	7,101	11,386	16,818	26,611	30,005
As % of GDP	2.04%	3.02%	4.23%	5.90%	7.05%	9.36%	11.87%	17.52%	na

[1] Securities issued by the Deposit Insurance Fund (Fogafin). [2] Securities issued by the Agricultural Development Bank (Finagro). [3] Other public debt instruments issued by the central government.

As to TES placement, in spite of progress in the use of market mechanisms (auctions), a large portion of these securities (80%) continue to be placed through direct arrangements with captive buyers ("agreed" or "forced" investments). Most of these captive buyers are public entities. In order to prevent financing of the fiscal deficit directly through TES purchases, the BR banned between 1997 and 1999 outright purchase of TES (for monetary expansion purposes) had they been initially placed through non-market mechanisms. Nevertheless, these securities have always been accepted as collateral for the BR's short-term repos, which are the mechanism used to provide most of the liquidity in the financial system.

These sorts of restrictions, imposed by the BR itself, have contributed to segmentation of the secondary market for certain issues.[31] Nevertheless, OMO management via indirect market

[30] Decree 2520 of 1993 regulating Law 31 of 1992.

[31] A set of decisions taken between late 1999 and May 2000 eliminated the distinctions between types of placement (auction, agreed and forced) and restrictions on their acquisition by the BR, which will help eliminate this segmentation factor.

mechanisms has had a positive impact on the liquidity and depth of the public debt market and on development of the repo market in Colombia. In fact, BR repos accounted for 52% of all repo operations with TES on the secondary market in 1999 and 58% so far this year. As a result of outright purchases, TES holdings as part of BR assets accounted for 7.4% of all TES in circulation in 1998, 6.6% in 1999 and 5.4% as at March 2000.

In general terms, the current supply of public debt securities is sufficient to conduct the monetary policy based on collateral under conditions of macroeconomic stability. However, the market is still small, illiquid and segmented. Therefore, in periods of financial market and exchange rate volatility, as was the case in 1998, the country has faced serious difficulties due to a shortage of available public securities.[32]

The effectiveness of this monetary policy instrument also depends on the availability of public debt securities held by financial intermediaries, which can be used as collateral in OMOs. This stock proved insufficient during the more critical economic periods in 1998 and 1999, when the BR was unable to place all scheduled liquidity via this mechanism. At certain points, it even was obliged to accept bank loans held by intermediaries as collateral for its expansionary operations. This clearly was more risky and operationally complex than operating against TES. However, the problem has been overcome in recent years. As illustrated in Table 2, the TES holdings of financial intermediaries increased fourfold between December 1997 and the first quarter of 2000.

Table 2

Evolution in TES-B holdings of the public and private financial sectors, 1994-2000

(Billions of pesos)

Holder/year	1994	1995	1996	1997	1998	1999	March 2000
Public financial sector	20.0	287.5	445.6	499.5	260.5	1,157.0	1,368.7
Private financial sector	209.2	178.3	422.6	402.7	610.1	1,235.3	2,355.5
Commercial banks	123.7	129.3	316.7	323.8	523.0	899.6	2,010.0
Others	85.5	48.9	105.9	78.9	87.0	335.6	345.5
Share of financial sector	11%	12%	13%	9%	6%	12%	17%

II. The use of collateral in intraday repos

The real-time gross settlement (RTGS) system was adopted by the BR in July 1998 to mitigate credit and liquidity risks and, particularly, to prevent propagation of systemic risk in the large-value interbank payment system. Due to the fact that overdrafts are not allowed, transactions are not processed if funds are insufficient to cover the corresponding payment instructions.

As illustrated by the Bank for International Settlements (1997), international experience shows the RTGS is demanding in terms of intraday liquidity management. This was the case in Colombia. The RTGS was implemented at a time of high exchange rate volatility and deterioration in the liquidity and solvency of the financial system. Given tight aggregate liquidity at the time, intermediaries may have perceived difficulties or temporary gridlocks in the normal flow of intraday operations. In December

[32] Also, in 1998, there was no secondary market benchmark rate to apply the discount rate at which TES are received for OMOs. This was because the market had only begun to develop. As a result, the BR was forced to apply the overnight repo rate, which was as high as 80% during strong speculative attacks. This made BR liquidity resources extremely costly. The relative shortage of TES and the low percentage of bank assets in TES obliged the BR to accept bank loans as collateral. These problems were, however, overcome in 1999.

1998, steps were taken to overcome this hurdle by providing supplementary intraday liquidity[33] through the intraday repo mechanism; that is, with collateral and cost. Although charging for collateralised repos is not common in other countries, this measure is explained by our legal framework, which prohibits the BR from extending overdrafts and free credit to financial intermediaries.

Access to intraday repo is restricted to credit institutions, in an amount not to exceed 25% of their equity. Most public debt securities that are eligible for the normal overnight repo operations authorised by the BR are accepted as collateral. Payback must occur before 7 pm. Initially, the cost was set at the 20% equivalent of the average bank deposit rate (DTF) - close to 7% annual equivalent at the time - but was reduced to the 0.1% annual equivalent in August 1999.

The operating rules concerning valuation of collateral are identical to those for overnight repos. That is, collateral is received at its net present value (being the TES secondary market rate plus the discount rate) and haircuts are applied as noted in Section I.A. The intraday repo applicant must place his TES and other public debt securities in a special account only when he decides to use the facility. If the intraday repo is paid back before 7 pm, the same collateral may be used for an overnight repo.

Contrary to what was anticipated, not much use has been made of this facility: the BR intraday repo/active repo ratio averaged 0.9% between September 1999 and March 2000, except in December 1999, when it rose to 4.2%. Put in other terms, the average daily amount of intraday repos represented only 7% of the average end-of-day balances of commercial banks in their accounts at the BR, with a peak of 18.5% in December 1999. This may be for the following reasons: i) there is sufficient intraday liquidity in the system, given the level of excess reserves maintained by banks (well above the legal requirement);[34] ii) the extent of professionalisation in bank treasuries remains limited and they still seem to prefer overnight repos, instead of taking advantage of the lower cost of intraday repos; iii) the interbank market operates well enough and may have operational requirements that are more lax, making it desirable to some participants.

III. Operational aspects of the DCV and SEN

A modern and sound technical infrastructure is required to implement a collateral-based monetary policy. The active participation of the BR has been decisive in modernising the payment system with this end in mind. The BR has operated since 1992 the Central Securities Depository (DCV), which has been designed to facilitate dematerialised management of public debt and BR securities. Since the beginning, the DCV has applied the DVP-Model 1 principle for non-financial intermediaries. In 1998, the real-time standard was extended to credit institutions as well, when RTGS started to be applied to all large-value transfers. The BR's technical platform offers users (see Section I.A) online connection in real time, dematerialised securities, pre-matching of operations, settlement in t+0 with same day funds, definitive and irrevocable transfer of securities and money. A securities lending facility is expected to be available by 2001, and possibly margin calls.

Although considerable progress has been made in terms of fungibility, it is still limited (there are at least four annual issues of TES with one- to three-year maturities and no fungibility in the case of some Fogafin bonds and those of Finagro). There are too many types of debt instruments and most of their issues are small and illiquid.

Another important BR contribution to capital market development is the electronic trading system (SEN) for public debt securities. It has:

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[33] To facilitate the flow of interbank operations throughout the day, the CB also changed the schedule and sequence of intraday operations between financial intermediaries, the BR and the CG Treasury.

[34] The reserve surplus, expressed as a percentage of the legal requirement, averaged 2.5% in 1999 and over 4% so far this year. It was over 12% in the final two months of 1999.

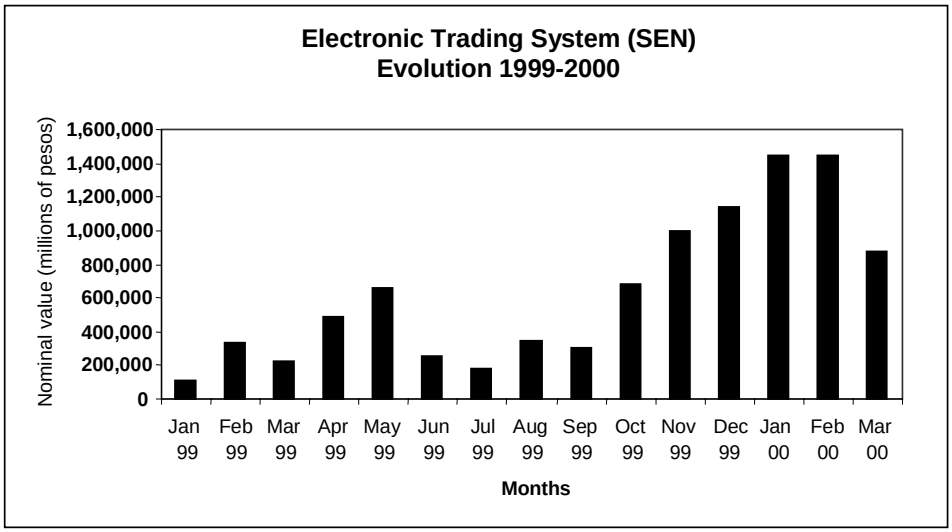
– contributed to greater transparency in the formation of reliable benchmark prices (through blind and semi-blind trading rounds and by allowing all entities participating in the system simultaneous access to real-time offers and immediate knowledge of agreed transactions);

– attracted banks and other intermediaries and stockbrokers to this transaction platform, under conditions of equal access, increasing market liquidity;

– facilitated progress in terms of extending the yield curve.

The SEN has an interface with the DCV that ensures an automatic and safe settlement of matches under DVP with batch dispatches every half-hour. In addition, the SEN generates real-time public information for the entire market on agreed amounts and prices. The swift increase in securities traded on the SEN during its first 15 months of operation is illustrated in the following graph.

Graph 2



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Optimisation of liquidity in real-time settlement systems
Denis Beau, Head of the Large-Value Payment Division, Bank of France

I will focus my contribution to the discussion of optimisation of liquidity in real-time settlement systems on the lessons we have drawn at the Bank of France from a modelling exercise of our large-value payment systems.

I think that the characteristics of the functioning of the French payments infrastructure may be of general interest as it cumulates two new features that have emerged rather recently in the field of large-value payment systems:

– firstly, a continuous net settlement system called PNS, which went live in April 1999, and which runs in parallel with an RTGS, TBF, the French component of TARGET; PNS replaced another system called SNP which was a standard deferred net settlement system;

– secondly, a bridge between TBF and PNS which allows participants to move their liquidity between the two systems at any time during the operating day.

These new features have led us, as part of our task of overseeing the orderly operation of this infrastructure, to set up a simulator which we have used in particular:

– to obtain indications about ways to optimise liquidity management in TBF and PNS;

– to assess the benefits brought by the change of the netting system from a standard deferred settlement system into a continuous settlement system.

The detailed results of this work are discussed in a paper which I think is part of the background documentation made available to you for this workshop.

So what I would like to do now, after a brief description of the simulator and the methodology we used to exploit it, is to focus on four of the main results we came to regarding liquidity optimisation in the French systems.

The simulator uses the same settlement rules as those found in the real systems. This means that we have reproduced the three distinct processes which are at the heart of the functioning of TBF and PNS.

For TBF it consists in queue screening, multilateral global optimisation, and the simulation process dedicated to the settlement of ancillary systems. The FIFO principle is observed in all of these processes.

For PNS, it consists in queue screening, bilateral partial optimisation, and multilateral partial optimisation. All three processes observe bilateral cap constraints. Only the first two follow the FIFO principle.

In addition, the mechanisms that allow transfer of liquidity between TBF and PNS have also been modelled.

This modelling of critical processes allows the simulator, which uses records of actual days' transactions, as well as actual values of beginning daily balances in TBF and bilateral caps in PNS, to reproduce faithfully the functioning of the actual systems, despite some simplifications we introduced between the model and reality.

If I turn now to the methodology used to analyse the reactions of the simulator, two major points can be kept in mind.

Firstly, we have tried to measure differences in functioning brought by changes to liquidity transfers between TBF and PNS and to optimisation routines used by the systems.

Secondly, our measurement is based on three indicators intended to capture the main characteristics of the technical functioning of the systems, namely:

– The degree of congestion in the system or, to put it differently, the extent of queuing. This is measured by a coefficient called DK, which combines the two dimensions of the wait: the amount of pending transactions and the length of time they have been pending in the system. The coefficient DK is expressed in billions of euros times hours.

– The extent of settlement which does not occur immediately on a gross and individual basis, but happens through the various queue screening and optimisation procedures. It is measured by a coefficient called rate of deferred settlement, which reflects the proportion of the value of all funds changing hands during the day and settled via the various queue screening and optimisation procedures.

– The risk of gridlock situations, where a failure of some transfers to be executed prevents a substantial number of other payments from other participating banks from being executed. It is assessed by what we call the rejection rate, which is the ratio in value terms of rejected payments at the end of the processing day to the overall turnover of the day.

Before turning to the results we obtained I would like to say an additional word about the liquidity scenarios we used because they are a key input to the simulations.

These scenarios have been designed to test the impacts of a reduction of the total central bank money inflows in PNS and symmetrically an increase of central bank money available in TBF, but also to test the impacts of a change of their distribution among participants and of their timing during the day.

These objectives have led us to define two families of scenarios:

– Type 1 scenarios moderately reduce the overall liquidity present in PNS but curtail more sharply the amount of liquidity provided by participants with a net credit position resulting from the processing of all the payments in PNS on a given day. In the extreme version of this scenario, we call it the "scenario 1 - 0%", such participants with a net credit position in the system at the end of the day do not transfer liquidity to PNS at all. All the liquidity comes from participants with a debit position. In this sense the type 1 scenarios can be seen as "non-cooperative" ones.

– Type 2 scenarios limit more sharply liquidity inputs in PNS, and concentrate them at the beginning of the processing day. The inputs are distributed across the participants in proportion to the cumulative amounts of transfers they originate. This is the reason why we call these scenarios "cooperative" ones. Because these initial inputs are not sufficient to settle all the transactions, participants must provide at the end of the processing day the additional liquidity needed to cover any debit position.

Let me turn now to the results we drew from these simulations. I will start with the good news.

During the period of testing, from 19 to 29 April 1999, TBF appeared to be used and to be functioning in an efficient way.

Being an RTGS system, participants should manage their liquidity in TBF so that processing and final settlement of funds transfers take place continuously on a gross basis.

Results of the simulation show that TBF functioning is close to this benchmark:

– the degree of congestion in the system is very low and shows a low sensitivity to more liquidity inputs;

– the cumulative amount of transactions settled on a gross basis is around 85 % and also shows a low sensitivity to more liquidity inputs.

These results are a sign that the liquidity constraints faced by participants when using TBF are well accommodated, thanks certainly to the active management of their payment flows, but also thanks to the intraday credit policy we implement as a member of the Eurosystem. Intraday credit is provided at a cost low enough not to entice participants to delay payments and wait for incoming payments from their counterparties and the activation of optimisation routines.

This functioning contrasts significantly with the functioning of PNS, where the degree of congestion is eight times higher than in TBF and in which the majority of the payments are settled through bilateral netting and optimisation routines. These differences reflect the fact that participants see TBF and PNS as providing different and complementary services: immediate settlement for TBF, low liquidity requirements for PNS.

While the functioning of TBF appeared satisfactory, this did not seem to be the case for PNS. As a matter of fact, simulations show that PNS could function with much smaller inputs of liquidity than were currently made in April 1999. A sign of this is that a division of liquidity inputs by five would translate into a multiplication by only two of the extent of queuing in the system.

More precisely, it appears that if distribution of liquidity inputs were done according to our non-cooperative scenarios, total inflows could be limited to 130% of the sum of the potential overall debit positions of participants in the system, without changing significantly the degree of congestion in the system and creating any significant risk of gridlock. This proportion could be lowered further, but this would require a more cooperative distribution of liquidity inputs. In addition, such a move would require close monitoring by the system manager as there would be a need to activate the multilateral partial optimisation routines to solve potential gridlock situations.

On the basis of these results we tried to see if a change of the optimisation routines available in PNS could be of help in the optimisation of liquidity management in this system. We therefore tried three different changes:

– a variant of the queue netting where the FIFO principle is replaced by a first available, first out principle;

– pairing of matched payments, typically money market funding deals rolled over from one day to another, which would be placed when identified at the head of the queue for bilateral optimisation;

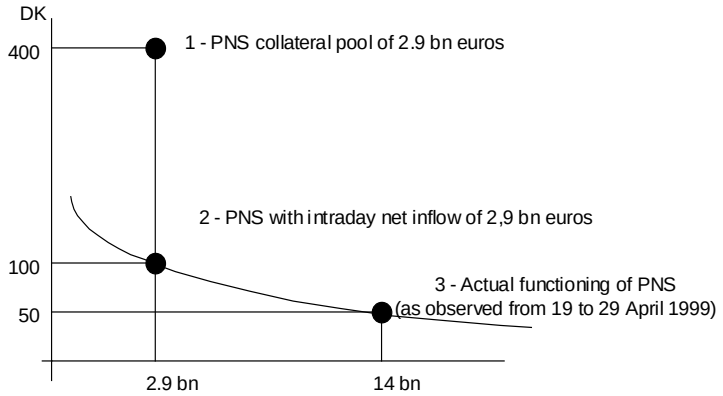
– automated transfers of liquidity between TBF and PNS. The results of the simulation are rather mixed. Without entering into the details of the results we obtain, the bottom line is that PNS does not lack an optimisation routine which would significantly improve the potential for liquidity optimisation in this system.

Even if simulations showed that PNS could be used more efficiently by market participants, they also underlined that they were nevertheless better off using that system than if the French netting system had remained a standard deferred net settlement system.

The first obvious benefit has to do with the reduction of settlement risk provided by using a continuous net settlement system rather than a deferred one.

But participants have also benefited from a reduction of their waiting costs with no increase of opportunity cost of liquidity. This is what the graph tries to show. It relates the degree of congestion in the system to the level of liquidity inflows provided by its participants.

Graph: Cumulative intraday net inflow of central bank money in PNS



If we make the simplifying assumption that:

– the cost of waiting is an increasing function of congestion, and

– the opportunity cost of intraday liquidity is an increasing function of its amount,

the plotted operating curve can be considered to relate the cost of waiting to the opportunity cost of liquidity. If we then position SNP and PNS on this graph we see that in moving from a deferred to a continuous settlement system, we pass from point 1 to point 3.

Of the 350 unit gain in system DK:

– 300 units are attributable to the sole characteristics of the PNS system, which with the same amount of mobilised collateral as in the SNP system, EUR 2.9 billion, would have a DK of about 100 as shown in our simulaton (scenario 2 - 75%).

– 50 units are attributable to mobilisation of additional liquidity in PNS.

To sum up briefly, I would like to stress that we have used these results as a basis for discussion with market participants to help them capture the potential for reduction of liquidity inflows in PNS without increasing significantly the cost of delay, or the degree of congestion.

As a result, payments inflows in PNS have been significantly brought down, to an average of EUR 9 billion in the first quarter of 2000. During the same period, TBF functioned smoothly.

Nicaragua: the road to RTGS
Susana Zarruk de Muñoz, Head of Payment Systems Department, Central Bank of Nicaragua

In Nicaragua, only one Interbank Clearinghouse exists, which is the physical place where the clearing operations or exchange of cheques received by each bank drawn on other banks in the financial system of a country takes place. This operation implies a delivery of cheques from the sending banks (collectors) to the receiving banks (payers); hence, settlement between the value of the presented cheques and the values of the received cheques is achieved.

In our country, the Central Bank of Nicaragua (BCN) is the institution in charge of the coordination, management and establishment of the interbank clearing process, by virtue of Article 38 of its Charter, which states:

"The Central Bank may open accounts for banks and financial institutions, and may accept deposits from them under the terms and conditions that are generally determined. The Central Bank may also, under the conditions determined for the Clearinghouse by its Board of Directors, provide clearing services for cheques and other securities, for banks and financial institutions.

Balances of reserve requirement deposits of the financial institutions will serve as the basis for the credits and debits that result from the operations of a cheque clearing system through the Clearinghouse."

As laid down in Article 3 of the Interbank Clearinghouse Regulation, the banks of the financial system must keep current accounts open at the Central Bank, which will be credited or debited according to the net results at the end of each day's clearing sessions.

In 1996, by means of Program 960 BID/BCN for Institutional Reinforcement from the Inter-American Development Bank (IADB) and with Technical Assistance from the International Monetary Fund (IMF), the modernisation of the Nicaraguan payment system was started. The Central Bank of Nicaragua approved, on 13 August 1996, the Norm for the Standardisation of Cheques, which instructed commercial banks to adapt the manufacture of their cheques to the specifications in the Norm. This constituted the first phase of the modernisation project.

With the passing of this Norm, the acquisition of MICR[35] technology and the re-engineering of processes, on 16 August 1998 the Central Bank of Nicaragua, together with the banks of the financial system, inaugurated the payment system modernisation process.

The modernisation of the payment system has not only been external, but has also entailed far-reaching changes within the Central Bank, such as guaranteeing financial institutions daily availability of their funds, immediately after the closing of each daily clearing session, no later than

[35] Magnetic ink character recognition.

11 am and 4 pm respectively on each workday.[36] As a consequence of these improvements, the interbank clearing process has been considerably streamlined and has become more dynamic, efficient, secure and agile.

Before this modernisation was implemented, documents presented and returned by the banks were sent to the Clearinghouse a day later. The new circumstances permit banks to present them hours later during the same day, considerably reducing the time taken for funds to become available to customers.

Likewise, cheques from the different regions of the country are sent daily to the afternoon clearing session the day after their deposit, banks having availability of their funds the same workday as their presentation to the Clearinghouse.

Previously, only one clearing session was held daily. Beginning 1 June 1998, two sessions are held: one in the morning and the other in the afternoon. In the morning session, banks send cheques deposited during the afternoon of the day before; and in the afternoon session, cheques deposited in the morning, regional cheques, returns and high-value cheques are presented. As from the same date, an electronic connection was also established between the Central Bank and the banks, allowing the latter to obtain the information from the magnetic stripe of cheques received after every session.

The interbank clearing process was previously decentralised, as the exchange of cheques in the country was handled in four different Clearinghouses - three in the regions[37] and one in Managua - and only one clearing session was held daily. It was a manual process, being of a low technological level, labour-intensive (60 persons in total), and lasting on average every day three hours for the preclassification and arranging of documents and from four to five hours for the exchange of documents (eight hours in total). The modernisation concluded its first phase on 16 August 1998, with the centralisation of the settlement operations in the city of Managua.

The Nicaraguan payment system modernisation programme at the same time replaced the interbank funds transfer system with a more secure and agile one, which consisted in eliminating the practice of using authorised-signed letters required to make funds transfers. The system in use was completely manual, slow and required banks to send their messengers every time they wanted to transfer funds from their reserve accounts. In January 1999, the Central Bank set up the Telephone Funds Transfer System (TTS), carrying out in minutes the operation of transferring funds from the reserve accounts of one bank (originator) to another (confirming). This new process operates through the use of secret codes and immediate credit to the reserve account of the beneficiary bank.

Banks have reported a high level of satisfaction and security in the new clearing process, which has given them the opportunity to clear their cheques in a more efficient way, reduce float, identify cheques with insufficient funds more easily and manage their current accounts with greater precision, which has resulted in increased trust in cheques as a method of payment. This is borne out by the increase in the volume of cheques sent daily to the Clearinghouse, with a 22.4% increase over the year before.

The modernisation of the payment system in Nicaragua has also had a great impact internationally. In 1999, delegations from the central banks of Honduras and Guyana held work sessions with personnel from the Payment System Department at the Central Bank of Nicaragua, in order to observe the automated clearing process and be able to implement it in their respective countries.

At the same time, in January 1999, the Central Bank of Nicaragua, with the support of the IADB and IMF organised the seminar on “Payment Systems in Transition in the American Continent”. The objective of this seminar was to promote the exchange of information between the participants to push for a more efficient use of human, technological and economic resources in the region.

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[36] Workdays for the Central Bank of Nicaragua are Monday to Friday.

[37] Regions: in the Departments of León, Matagalpa and Estelí.

The international impact of this modernisation has been extremely positive, in terms of the future homogenisation of payment systems in the Central American region (technological, legal, etc) so that cross-border payments can flow more easily.

1. Present situation of the Nicaraguan payment system

a. National environment

In Nicaragua, 12 banks currently participate in the clearing process, which, when added to the Ministry of Finance and the Central Bank of Nicaragua, make a total of 14 institutions participating in the interbank clearing process.

Of the 12 banks, the Bank for Popular Credit - state-owned - is in its final liquidation process. The remaining banks are privately owned, the majority of recent creation - having no more than 10 years of existence. The only exception is the Nicaraguan Bank of Industry and Commerce, which has been in operation for about 50 years.

Currently, an average of 302,622 cheques are processed monthly in the Clearinghouse. Of these, about 22.4% are from the Ministry of Finance and 0.17% from the Central Bank of Nicaragua.

The rate of growth for cheques processed in the Clearinghouse over the year before is 22.34%. With regard to the rejection rate, a considerable reduction has been seen, from a 4.33% global rejection rate to 2.88% in the last four months. It is worth mentioning that this present rate is below international standards.

b. The role of the Central Bank in the Nicaraguan payment system

In the Nicaraguan payment system, the Central Bank of Nicaragua has the role of administrator of the Clearinghouse and of the services offered. At the same time, it is the regulator of the payment system and a lender of last resort - to cover situations of insufficient liquidity.

The Central Bank, as the administrator of the Clearinghouse process, is in charge of making the necessary analysis in order to follow international risk control norms (Lamfalussy standards), set a clear legal framework, measure and control the risk of the participants and the Central Bank and establish rules and regulations for the different services offered.

2. Characteristics of the cheque clearing system (low-value)

The clearing is carried out under a multilateral netting scheme, with no distinction between high and low value.

MICR technology is used for cheque recognition, which was introduced in 1996 through the Cheque Standardisation Norm passed by the Board of Directors of the Central Bank. At present, all cheques of the national financial system are standardised, which has resulted in low rejection levels below international standards.

The backup system used in the Clearinghouse consists of the capturing of cheques by microfilming them as they are read by the NDP250 (Network Document Processor) transport.

The clearing process is centralised in Managua, where all the participants have their main offices. The Central Bank conducts two clearing sessions daily - one in the morning and one in the afternoon. Generally, banks send in the morning all those cheques collected on the afternoon of the day before in Managua, along with regional cheques (outside Managua) that could not be sent to the afternoon session the day before. Hence, cheques collected early in the morning, as well as regional cheques, are sent to the afternoon session. The time elapsed between the receipt of a cheque at the bank and its presentation to the Clearinghouse is one day.

Two currencies are processed at the Clearinghouse - Córdobas (national currency) and US dollars.

Crediting and debiting of the reserve accounts is automatically executed on (T=0) at the end of each session. However, as a general rule, funds are credited to customers three days later (T+3) if they are from Managua and six days later (T+6) if from the regions.

Risk control in the Nicaraguan payment system is undertaken by placing restrictions on overnight and intraday credits, by keeping a strict control on reserve requirements and by constant supervision on the part of the Superintendency of Banks and Other Financial Institutions.

a. Participating institutions in the Clearinghouse

The Nicaraguan Clearinghouse has at present 14 participating institutions distributed as follows: 11 private banks, one public bank (undergoing liquidation), the Ministry of Finance and the Central Bank of Nicaragua.

All the banks, except for the Nicaraguan Bank of Industry and Commerce, have centralised in their head offices the processes of post-codification and preparation of cheques to be sent to the Clearinghouse. The funds verification process for cheques, in order to know the returns that are to be made, is also centralised in all banks. This verification of funds is done through information systems connecting all branches online to head office.

As part of the process that cheques go through before being sent to the Clearinghouse, it is worth mentioning that these are manually prepared, due to the small volume of cheques handled in banks. The preparation consists on the separation of government or fiscal cheques, classification by currency, and the post-codification of the cheques to be sent to the Clearinghouse and their sorting into bundles.

The clearing process lasts on average 2½ hours, allowing immediate booking on the reserve accounts of the participants, who can count on the immediate availability of their funds.

At the end of each clearing session, participants receive electronically, by means of the BCN On Line connection, a file containing information on cheques presented to them for payment. Banks receive the file, previously modified, and apply it to their systems in order to adapt it to their internal accounting system. Nine out of 11 participating banks follow this procedure.

The verification of funds for cheques received from the Clearinghouse, using the BCN On Line file, is done automatically. But, a verification of the physical cheques also takes place before accounts are debited. These accounts are then automatically debited as the verification process of the electronic file with the physical is concluded.

When a cheque is subject to a return,[38] it is put inside an envelope and the magnetic stripe is printed on it, specifying the amount, account number and destination bank receiving the return. As the return is presented, a new clearing cycle is initiated.

The average time that a bank takes to present a return is one day, and the credit to account holders is done in three days if the cheque is from Managua, six days if it is from the regions and up to 10 days if it is from the Atlantic Zone of the country (the most remote area from the capital Managua).

b. Services and tariffs

Services offered to banks are subject to a Tariff System,[39] which was approved on 11 January 1999 by the Board of Directors of the Central Bank of Nicaragua. From the start, the modernisation of the payment system contemplated the offering of services to the financial system under a tariff system, with the purpose of achieving self-sufficiency. In the same vein, this programme envisages that in the medium term the payment system can be transferred to the private sector.

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[38] In accordance with the General Law on Securities, approved by Decree No 1824 of July 1971.

[39] Tariff System in force for the Financial System.

The Tariff System for services at the Clearinghouse such as classification, ordering of documents and annex services, operates by means of automatic debits to the reserve accounts of the participants.

3. Interbank telephone funds transfer system - TTS (high-value system)

The Secure Telephone Transfer System (TTS) is currently used to make high value interbank funds transfers. Statistics of the last few months reveal that there is a growing trend towards utilisation of this system.

The characteristics of this system are the following: transfers are irrevocable; reserve account crediting/debiting is immediate; amounts transferred are only of high value; it is a system of one debit for one credit; a transfer is declined when there are insufficient funds; and a high level of security exists.

These transfers are executed by means of a telephone system and a voice-recording device, where an operator receives the order from the bank that originates the transfer to debit its reserve account. Before finalising the debit, this is confirmed by a second operator by calling the person in charge of confirming the debit requested by the first operator from their bank. The operation between the receipt, verification and crediting/debiting of the reserve account takes place in a maximum of 10 minutes.

With this new system, the interbank high-value funds transfer system has been expedited, making it possible to credit funds to the reserve accounts of banks almost in real time (10 minutes). However, regional transfers are still handled using written letters authorising the account movement. The integration of the regional branches of the Central Bank in its internal network is currently being worked on, aimed at smoothing the progress of the verification process and of the debit of transfers in the regions.

Nonetheless, all the transfers in Managua are carried out using this system. It is intended that in the future these transfers will be carried out using an online system, where it will be banks themselves directly debiting/crediting their reserve accounts. The Central Bank will only be the administrator and supervisor of these accounts.

4. Legal framework

Beginning in 1996, a set of laws and regulations allowing the development and modernisation of the National financial system has been implemented in Nicaragua. Among the main laws affecting the Nicaraguan payment system, there are: the General Law on Securities, the General Law on Banks and Other Financial Institutions, and the Charter of the Central Bank of Nicaragua. Furthermore, and based on the authority granted to it by law, the Central Bank of Nicaragua has issued a series of regulations and norms to regulate the Nicaraguan payment system, such as the Automated Clearinghouse Regulation, the Financial Norms and the Cheque Standardisation Norm among others.

a. General Law on Securities

This regulates everything concerning the cheque as a security, ie its characteristics, ways of being negotiated and causes for returns. In the same manner, it sets time limits on presentation of a cheque for payment and expiration dates for securities.

b. General Law on Banks and Other Financial Institutions

According to the provisions of Article 119, banks are permitted to use computerised, electronic and microfilm systems, or systems of any other kind, in their operations and bank services. This Article, in particular, allows the Central Bank of Nicaragua to utilise electronic means to quicken the country's payment system and optimise information storage systems.

c. Charter of the Central Bank of Nicaragua

The Charter of the Central Bank of Nicaragua, in its Article 38,[40] authorises the Central Bank, represented by its Board of Directors, to determine the conditions under which clearing services for cheques and other securities are to be offered to banks and other financial institutions. Additionally, it provides for the use of reserve accounts as the basis for the functioning of the clearing system through the Clearinghouse.

d. Automated Clearinghouse Regulation

The Board of Directors of the Central Bank of Nicaragua, in August 1997, issued a Regulation for the clearing of cheques in the country's banking system, by which a set of procedures, schedules and conditions were established to regulate relations and responsibilities between the participants and the Central Bank.

e. Financial Norms of the Central Bank of Nicaragua

The Financial Norms of the Central Bank of Nicaragua have established, in the section on Credit Norms,[41] Chapter 3, a Special Line of Overnight Credit that is designed solely to address situations of insufficient liquidity. This line of credit is granted on demand for a 24-hour period and is non-renewable, it can be used up to four times a month, provided that at least two workdays have passed between uses.

f. Norm for the Standardisation of Cheques

In 1996, the Board of Directors of the Central Bank of Nicaragua approved the Norm for the Standardisation of Cheques,[42] in order to begin the first phase of the modernisation of the payment system in Nicaragua - the automation of the Clearinghouse. This Norm requires all cheques in the Nicaraguan banking system to have a magnetic stripe following specifications laid down in the Norm. This decision is based on the power granted by the Charter of the Central Bank to its Board of Directors to set conditions for the clearing of cheques and securities.

5. Risk administration

When talking about risk in a payment system, several different types are mentioned: legal, liquidity, systemic, credit and operational. At the level of the Central Bank of Nicaragua, an infrastructure has been developed that permits better control and administration of risks in the financial system.

Laws have been reformed so that they support the development of the financial system, being clear to all participants in the system and supported by a series of rules and regulations that define the responsibilities of each participant, including their obligations, rights, duties and sanctions.

In order to control systemic and liquidity risks, there is a defined infrastructure of intraday and overnight credits that can resolve momentary situations of insufficient liquidity. Access to these credits is limited by a series of conditions. This, alongside the constant and efficient supervision by the Central Bank and the Superintendency of Banks, has prevented the risk originating from the incapacity of a bank to meet its payment obligations from affecting the stability of the system.

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[40] Charter of the Central Bank of Nicaragua, Chapter IX: Operations with Banks and Financial Institutions, October 1999.

[41] Financial Norms of the Central Bank, Title II: Credit Norms, Chapter 3: Special Line of Overnight Credit (Article 74 of the Financial Norms authorised in Resolution CD-BCN-VII-1-94 on 7 April 1994).

[42] Norm for the Standardisation of Cheques, authorised in Resolution CD-BCN-XXI-1-96.

The operation and functioning of the Nicaraguan payment system - the Automated Clearinghouse, telephone fund transfer system (TTS) and BCN On Line - are backed up by a set of contingency plans that ensure normal operation of the financial system under adverse situations. These contingency plans are broadly known by the participants and by the persons involved in the operation of the processes and in their administration.

6. Road to RTGS

Economic authorities worldwide, pushed by globalisation processes and market trends and by constant increases in private capital flows, have seen the need to evaluate and analyse their payment systems, with a vision of intertwining their operational efficiency, speed and timeliness; at the same time as reducing or containing financial risks. All economies, large or small, are in the process of evaluating, modernising and smoothing the progress of their payment systems. Nicaragua is not being left aside in this global tendency.

Since 1996 and under the auspices of the IADB and the IMF, the Central Bank of Nicaragua has been involved in a restructuring and modernisation process encompassing the modernisation of the payment system.

The need was made clear, to a growing private banking sector, that one of the modernisation's fundamental processes to improve the financial flow in the country was to modernise the cheque clearing process - by eliminating the manual and slow way of doing this. This would allow banks to know their real positions more efficiently thanks to a more agile, efficient and secure system.

The second point was to speed up the funds transfer system, carried out manually (by letter). To acheive this, the Secure Telephone Transfer System (TTS) was implemented, expediting the transfer of high-value funds.

Furthermore, an information system was implemented for banks that enables them to know the actual balances of and movements made in their reserve accounts. This information is updated every five minutes and banks can access it as they connect to the Central Bank server.

The next step in the modernisation of the Nicaraguan payment system is to make all of the process migrate to an electronic platform involving less operational participation by the Central Bank - which would come to have more of an analytical than an operational role. For this migration to be possible, the strategic plan for the modernisation of the Nicaraguan payment system provides, from 2000-03, for the development and implementation of the following projects:

a. Electronic Funds Transfer System (TEF)

In the short term, the Central Bank of Nicaragua will implement the Electronic Funds Transfer System (TEF). Under this system, banks of the financial system will be equipped with computer terminals in their offices, from which they will be able inter alia to execute high-value funds transfers (more than USD 10,000) using an online system connected to the current account system at the Central Bank, eliminating the need to place a telephone call to the Central Bank.

With this system, financial institutions will be able to make payments to third parties or to individuals (salary, rent, dividends, pensions, etc) using the TEF platform at the Central Bank.

b. Electronic Clearinghouse

Participating institutions will be able to send, via an electronic file, all the information related to each cheque, subsequently sending the physical documents to the Clearinghouse. With this, financial institutions will have funds to compensate (settle) available in much less time.

Conclusions

The Central Bank of Nicaragua, being responsible for the financial stability of the country, as well as the administrator and regulator of the country's payment system, and aware of this role, has concentrated in recent years on modernising its payment system, transforming it into an instrument that promotes stability, development and competition in the financial markets. At the same time, the aim is that of controlling, reducing and minimising risks that arise from transactions made through the payment system in the country.

Thanks to the financial support of the IADB, technical assistance from the IMF and the joint effort of the participants in the Nicaraguan payment system, the efficiency and security of the country's payment system can benefit its participants as well as to its users, who, through their increased trust in the national banking system, strengthen the Nicaraguan economy with their deposits.

The modernisation of payment systems is a universal trend, not only for the more developed economies, but also for countries with developing and emerging economies. The Central Bank of Nicaragua has set itself the task of modernising the payment system, guiding with a dedicated support the transformation of a manual process to an automated and electronic one.

TARGET and the coexistence of different large-value payment systems in economic and monetary union in Europe

Jean-Michel Godeffroy, Director General, Payment Systems, European Central Bank

It is a pleasure for me to share with you some of the experience which we have gained with TARGET and the coexistence of different large-value payment systems (LVPSs) in economic and monetary union (EMU) in Europe. As you know, the euro was introduced only in January 1999 as the common currency of those EU member states which entered the third stage of economic and monetary union. The introduction of the euro not only transferred the competence for monetary policy from the national central banks (NCBs) to the European System of Central Banks (ESCB) but also had significant implications for the LVPS infrastructure in the European Union. I can imagine that you may have a large number of questions concerning this new LVPS environment, especially as Europe may seem to be somewhat remote from this region. In this speech, I will try, at least, to address some of your potential questions, but as several matters are very much in progress at the present time, I will possibly not be able to answer all of them.

1. What is TARGET and why was it created?

TARGET is an acronym standing for "**T**rans-European **A**utomated **R**eal-time **G**ross settlement **E**xpress **T**ransfer" system. It consists of the 15 national RTGS systems of the EU countries and the ECB payment mechanism (EPM). These systems are interlinked to provide a uniform platform for the processing of domestic and cross-border payments within the euro area to more than 5,000 commercial banks which participate directly in TARGET. Under normal circumstances, even cross-border payments will reach their destination within a few minutes, if not within seconds. Thus TARGET allows market participants to centralise their treasury operations, as liquidity can be easily and swiftly transferred throughout the euro area, as is the case of a national monetary area. To allow a smooth flow of payments, banks can make very efficient use of the liquidity available. Besides minimum reserves, which have to be held for monetary policy reasons, credit institutions have access to unlimited but fully collateralised intraday central bank credit free of charge. Long operating hours from 7 am until 6 pm overlap with those of payment systems overseas and thus set the stage for mechanisms that could reduce settlement risk of foreign exchange trading.

The main objectives which TARGET is trying to achieve are to ensure the implementation of the ESCB's single monetary policy and a uniform money market without interest rate differentials, to

improve the safety and efficiency of cross-border payments in euros and, ultimately, to minimise systemic risk.

2. Why was TARGET created in such a peculiar way?

Owing to its unique structure, you might even ask if TARGET is actually one payment system, or rather a collection of linked systems. To provide the answer up front: it is one system, as access rules, performance features and the duties and obligations of the parties involved are the same in all national components. However, the current design does indeed need to be explained in terms of the historical development of TARGET.

When preparatory work began in 1993, it was decided that TARGET should follow a minimum harmonisation approach. The national RTGS systems should, it was felt, be linked to each other, as it would simply have taken too long to reach an agreement on the design of a single component which could have been used by all NCBs and could have replaced the RTGS infrastructure that was either already in place or being implemented at that time in the various EU countries. The tight deadline was a decisive factor in the creation of TARGET, and it was clear to us from the beginning that TARGET would, in any event, have to become operational at the start of Stage Three of EMU on 1 January 1999.

Long lead times and certainty in investments necessitated an early decision on participation in TARGET. Significant investments had to be made in the different countries and the technical work had to be almost complete before the decision on participation in EMU was made. Therefore the Council of the European Monetary Institute (EMI), the forerunner of the ECB, decided in 1995 that all EU countries should prepare to participate in TARGET in order to ensure that all future participants in EMU would have the necessary TARGET connection on time. This led to the peculiar situation that one central bank, the ECB, allows other central banks, those of the non-participating member states, to offer settlement services in its currency. These "out" countries are thus allowed to offer RTGS systems in euros even though they have not yet adopted the single currency. In November 1998 the ECB made it clear that this possibility afforded to "out" central banks was a specific exemption.

3. Has TARGET been a success so far?

Before the start of Stage Three many market participants were of the opinion that TARGET would be slow in processing payments, that its capacity would be insufficient, that it would be very demanding in terms of liquidity and that it would be too expensive to use. Even the International Monetary Fund took the view that, owing to high collateral costs and high transaction fees, TARGET might only attract a limited amount of business. I am more than a little proud to be able to say today that all these suspicions have been proved wrong.

TARGET led to the integration of the money market in the euro area immediately after the start of Stage Three of EMU. Not only did it meet its ambitious deadline, it has also become the standard for large-value payments in euros today. By offering short execution times at an acceptable price level, big and small banks alike are using TARGET. Bigger banks, which, of course, have cheaper alternatives for processing their payments, use TARGET extensively for their very high-value payments, for which TARGET offers advantages in terms of liquidity and finality. For small and medium-sized banks, which do not participate in the other systems, TARGET is attractive because its price is undoubtedly lower than the correspondent banking fees which they would otherwise have to pay for their cross-border transactions.

In the first quarter of this year a daily average of some 179,000 payments with a total value of EUR 1,003 billion were processed via TARGET, of which 37,000 were cross-border payments with a total value of EUR 413 billion. Compared to the first quarter of the previous year we experienced a very strong increase in cross-border TARGET payments (+51% in volume and +18% in value) whereas the development in domestic payments remained comparatively flat (+9% in volume and –4% in value). Today TARGET settles about 52% of the volume and 70% of the value of all large-value

payments in euros. You may appreciate these figures even more once they are put into a historical perspective. In 1993 the "market share" of RTGS systems in the European Union was only about 5% in terms of value. In 1998 it reached 50%, and today TARGET accounts for a share of as much as 70%. The objective of the Eurosystem, namely that large-value payments should primarily be settled via TARGET, is indeed being met. In this respect, I would say, TARGET is "right on target".

A brief comparison with the payment systems of the world's other two major economic areas shows that TARGET has attained a significant level of importance. In terms of value, TARGET processed the equivalent of about 80% of Fedwire payments and more than 70% of BoJ-Net payments last year.

4. Are there any shortcomings in TARGET and where might these lead?

Although TARGET has been a great success, I do not wish to hide the fact that we were, and still are, faced with some problems. In the first months of 1999, TARGET experienced several technical teething problems which reduced the availability of the system to about 98.8%. The Eurosystem has worked hard to improve the system technically, to eliminate these hiccups and to deliver to the market the reliable RTGS system that we had promised. As a result, availability has steadily increased and averaged 99.8% in the first three months of this year.

However, certain longer-term problems have yet to be solved. Some countries, especially the smaller ones, are finding it difficult to recover their costs as they only process a relatively small number of transactions. Because of the heterogeneous, decentralised structure of TARGET, changes to the system have to be duplicated in every single system, meaning 16 times in total. Another challenge will be the integration of the 12 potential new EU member states in central and eastern Europe. Furthermore, the market is demanding further changes and additional services from a state-of-the-art RTGS system. Participants are asking for a harmonisation of technical standards, a higher level of information (eg time stamps, queue management), a high level of availability including improved contingency arrangements as well as additional facilities (such as intraday cash management facilities).

Many of the arguments mentioned in this context are not new. They were already known at the time when TARGET was conceptually planned. The tight deadline, however, did not allow these issues to be given consideration. In fact, many arguments against harmonisation in the preparatory phase now actually speak in favour of it, as there are no longer any time constraints. The Eurosystem is well aware of the fact that these questions must be addressed and discussions on the future design of TARGET are already under way. There is broad agreement on the need to increase cost recovery and lower cost at the same time (a transaction in TARGET is, for example, around twice as expensive as in Fedwire). Thus the technically very heterogeneous TARGET system will possibly need some form of harmonisation or centralisation of IT features. This may lead to a simplification of the technical design of the system. The accounts of the participants, however, will, in any event, remain decentralised. First indications of the future RTGS topography of the euro area can be expected in the autumn of this year.

5. What other LVPSs exist in the euro area and what is the ECB's view on these?

Besides TARGET, five other LVPSs processing euros are currently in operation in the euro area. All systems have been evaluated by the Eurosystem. They settle in central bank money, fully satisfy the Lamfalussy criteria and are thus very sound. Two LVPSs in Spain and Finland are only of local importance; they together process less than 1% of the total of payment flows.

Euro 1 is a cooperative undertaking of 72 commercial banks from all EU member states and five non-EU countries. It is a net settlement system run by the EBA Clearing Company and started its operation with the introduction of the euro on 4 January 1999. In the first quarter of 2000, the market share of Euro 1 in euro large-value payments was 13% in terms of value and 26% in terms of volume. The increase with respect to the first quarter of 1999 was above the average for all LVPSs, most significantly in terms of volume. The growth of 76% in the number of transactions can largely be attributed to the rising number of commercial payments which are being shifted away from correspondent banking arrangements to be processed by Euro 1.

EAF is a hybrid system operated by the Deutsche Bundesbank. It processes about 11% in value and 15% in terms of volume of all euro large-value payments. With the introduction of the euro, EAF lost about half of its business, as it had previously largely settled foreign exchange transactions in Deutsche Mark, and now foreign exchange settlement transactions are also processed in other euro LVPSs. The French PNS system, a hybrid system, currently accounts for 6% of the large-value payment flows.

The multiplicity of different LVPSs has not led to a segmentation of the money market in the euro area. Some initial problems in banks' liquidity management at the beginning of Stage Three of EMU could not be avoided, however, as payments sometimes arrived through unexpected payment channels. But in the meantime the market has developed some guidelines in order to help the banks run their business more efficiently.

The ECB appreciates the importance of competition between the different systems. In fact, TARGET would possibly be not as efficient as it is if alternative LVPSs were not competing in the market. Nor do we have reservations in respect of banks using other systems, except in the case of very high-value payments, which we feel should be settled exclusively via TARGET. For certain categories of payments, especially commercial payments, for which immediate finality is not a compelling necessity, banks may very well decide for themselves which payment channel is most appropriate.

6. How might the European payment system infrastructure develop in the future?

I am, of course, not a clairvoyant who is able to tell you exactly how the euro LVPS infrastructure will look 10 years from now. However, some trends already seem fairly evident even today. Correspondent banking arrangements have been reduced in the euro area since the start of EMU, and there are clear indications that this development will continue in the future - maybe at an even greater pace. Consequently, these payments will be processed via euro LVPSs, TARGET and Euro 1 in particular.

If we compare the situation in the euro area, in which we currently have six euro LVPSs, with that of the United States, where just two LVPSs are in operation, it would appear that there may be room for some consolidation. Indeed, the Deutsche Bundesbank intends to merge EAF with its German TARGET component, ELS, in 2001, which will then lead to an increase in TARGET traffic. The advent of CLS will also have a significant impact on payment systems in the euro area. Other things being equal, all euro LVPSs will experience a reduction in volume as well as in value, as the foreign exchange transactions which are currently settled in these systems will to a certain extent be settled via CLS. This decrease will be less pronounced in TARGET, as all euro payments to and from CLS Bank's account at the ECB will be processed via TARGET.

Whatever the developments in euro LVPSs, the ECB is determined to let market forces prevail and achieve an infrastructure which they deem most appropriate. The only and indispensable prerequisite is that these developments do not have the potential to increase systemic risk and jeopardise a proper implementation of monetary policy.

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