

RTGS^{plus} – the Bundesbank's new system for individual payments

With the introduction of the euro on January 1, 1999, the European payment scene underwent substantial change, which has necessitated a re-orientation of the range of large-value payment services offered by the Bundesbank. In the single currency area, newly established European large-value payment systems have been put into operation and now share the (largely unchanged) volume of national and cross-border payments with existing European large-value payment systems. In cooperation with the German banking industry, the Bundesbank has designed a new liquidity-saving large-value payment system in euro called RTGS^{plus}, which unites the existing German large-value payment systems Euro Link System (ELS) – including the TARGET interface via the national interlinking component (NIC) – and Euro Access Frankfurt (EAF) to form a single payment system in euro. RTGS^{plus} is designed to set new standards in terms of services and availability. Having been approved by the Central Bank Council at its meeting on January 27, 2000, the project is now in the process of implementation. The following article will describe the main considerations that led to this decision and provide some insight into the design of RTGS^{plus}.

Profound change in European large-value payments since the start of Stage Three of EMU

Introduction of the euro and abolition of national currencies

With the introduction of the euro on January 1, 1999, the European payment scene underwent substantial change. In the single currency area, the newly established European large-value payment systems TARGET and Euro1 have commenced operations and now share the (largely unchanged) volume of national and cross-border payments with existing European large-value payment systems. As a consequence of the introduction of the single currency in the euro area, the former national link between the currency of the payment instructions and the settlement system or the place of settlement has disappeared. This has extended the geographical reach of payment instructions in euro, since, generally speaking, any euro payment system may be used to settle these payments – provided that the beneficiary can be reached via that system.

New opportunities in European large-value payments

The co-existence of various systems in the euro area (and in other EU countries such as the United Kingdom, provided that the systems are euro-compliant) opens up new possibilities for system operators, the banking industry and, last but not least, customers. Yet they also mean that all parties involved need to rethink their established payment settlement processes and practices and reorient them in strategic terms:

- System operators need to adjust their customer orientation. They are particularly faced with the question of what banks

and geographical regions they should address their services to.

- Credit institutions need to decide on the systems and payment channels they want to use. The main parameters underlying this decision are the incurred costs (including the associated liquidity requirements), the required velocity and security of payment settlement and the system-specific extra benefits (e.g. an efficient linkage to securities settlement systems).
- The banks' customers (including the correspondent banks in third countries) can streamline their bank relationships because they need fewer bank relationships in the euro area to settle euro transactions than in the past.

It was to be expected that market participants would make intensive use of the new opportunities, thus breaking up the payment structures that had manifested themselves over the past few decades. In fact, the new conditions very quickly resulted in radical changes in the European payment infrastructure.

Situation in European large-value payments

The TARGET network of the European System of Central Banks (ESCB) and the Euro Banking Association's (EBA) Euro1 are two payment systems which have rapidly established their presence as new players in the market.

TARGET

The TARGET system consists of the national real-time gross settlement systems of the 15 EU member states and the ECB's payment mechanism. All systems are interlinked, enabling urgent cross-border euro payments, e.g. money market transactions, to be settled safely between the EU member states in a matter of minutes. TARGET¹ is used primarily for interbank payments, for example in the context of banks' money market or foreign exchange transactions, but it can also be used by banks as a conduit for customer payments.² The settlement of interbank transactions is also the reason why TARGET became the most extensively used system (in terms of transaction value) for large-value payments in euro immediately after it was launched. One of the principal users of the system is the German banking industry, which accounts for more than one-third of all payment instructions submitted to TARGET. In addition, just over one-third of all TARGET payments are received by participants residing in Germany.

The EBA's Euro1 clearing

In terms of volume, by contrast, the EBA's Euro1 system is number one among European large-value payment systems. The large market share is due to the fact that Euro1 is used to a considerable extent for commercial customer payments. Unlike the real-time gross settlement systems run by the EU central banks, Euro1 is, by design, a (protected) net settlement system. Although Euro1 payments are final even before the end of the day, the clearing of the balances that originated during the day, and thus the transfer of central bank money between banks – via TARGET – is not carried out until the end of the operating day. The risk-reducing mechan-

Glossary

CHAPS Euro	The Bank of England's RTGS system in euro
CLS	Continuous Linked Settlement; payment system for the simultaneous settlement of both sides of foreign exchange transactions
EAF	Euro Access Frankfurt; the Bundesbank's system for the liquidity-saving settlement of large-value payments (hybrid system)
ELS	Euro Link System; the Bundesbank's current RTGS system
Euro 1	Payment system of the Euro Banking Association (EBA)
RTGS system	Real-time gross settlement system; generic term for a transaction-oriented payment system which processes payments in real time on a gross basis
S.W.I.F.T.	Society for Worldwide Interbank Financial Telecommunications; a society registered in Belgium and owned by the banking industry and central banks
TARGET	Trans-European Automated Real-Time Gross Settlement Express Transfer System; network composed of the EU central banks' RTGS systems

Deutsche Bundesbank

isms (such as credit limits for the individual members, stand-by liquidity pools and loss-sharing agreements) are designed to cope with potential defaults of participants at the end of the day.

The chart on page 62 provides an overview of the significance of the various euro-area payment systems on the basis of the working day averages of the number of payments.³ ELS is the real-time gross settlement (RTGS) system

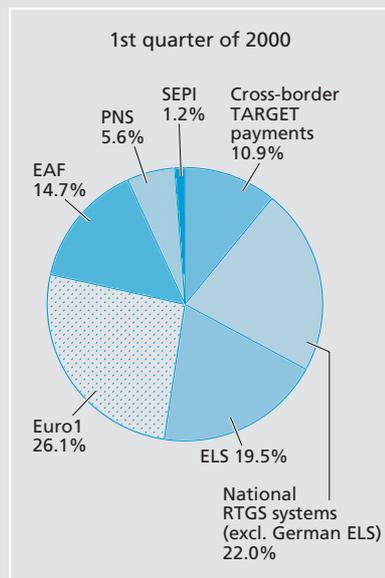
Shares in large-value payments in euro

¹ In this article, TARGET shall always refer to the cross-border network of the national RTGS systems. In a few other publications, TARGET also includes all national transactions of the participating RTGS systems.

² Customer payments are gaining increasing significance in TARGET. In March 2000, for example, 32.5 % of the instructions submitted were accounted for by customer payments (compared with 18.1 % in March 1999).

³ SEPI (Servicio Español de Pagos Interbancarios) is the Spanish large-value net settlement system, and PNS (Paris Net Settlement) is the French hybrid system, comparable with EAF in terms of its design.

Shares in large-value euro payments*



* In terms of volume (number of transactions).

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run by the Bundesbank; EAF is the Bundesbank's liquidity-saving hybrid system which combines elements of both gross and net settlement systems and in which payments are covered by offsetting payment flows or by prefunded central bank money.

However, the chart only provides a snapshot of the current market situation and does not fully illustrate the dynamics seen over the last few months. The evolution of selected large-value payment systems over time since January 1999 provides more details about the structural developments that occurred.

At the beginning of last year the launch of Euro1 and TARGET and the loss of the "home-field advantage" due to the introduction of the euro, especially concerning the

settlement of D-Mark/US dollar foreign-exchange transactions, resulted in a sharp decline in the use of Euro Access Frankfurt (EAF). As the year 1999 progressed, all systems discussed here showed a positive trend, with the distribution remaining fairly stable. This probably owes much to the fact that the settlement of cross-border euro payments by means of bilateral correspondent banking relationships has been reduced and that these payment instructions are processed by more cost-effective and efficient central payment infrastructures instead.

Irrespective of this growth, competition is expected to increase distinctly once CLS Bank enters the market. CLS Bank will simultaneously settle the currency leg of foreign-exchange transactions for selected currencies worldwide, adhering to the principle of "payment against payment". According to current plans, CLS Bank is due to begin operations in the second half of 2001.

CLS Bank likely to increase competition further

Impact on the Bundesbank's large-value payment services

The dynamic structural change and the developments described above have also prompted the Bundesbank to intensify its efforts to comprehensively reorient its range of large-value payment services. In this context, developments in EAF, the key competitive segment that includes an important international component, are of major importance. Although it had been expected that the volume and value processed via EAF would decline, the extent of that decline (to half of the volumes

Developments in EAF

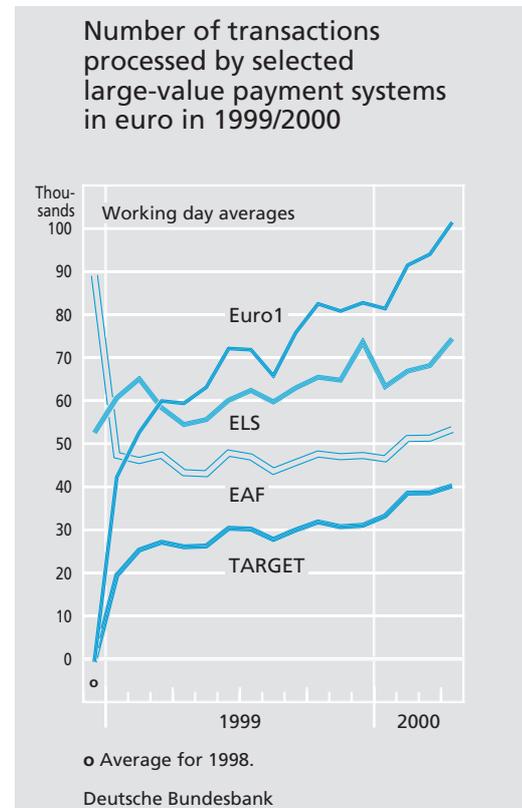
Evolution of selected large-value payment systems over time

and values processed in 1998) was rather surprising. There are various reasons for these developments.

Reasons for the decline in the use of EAF

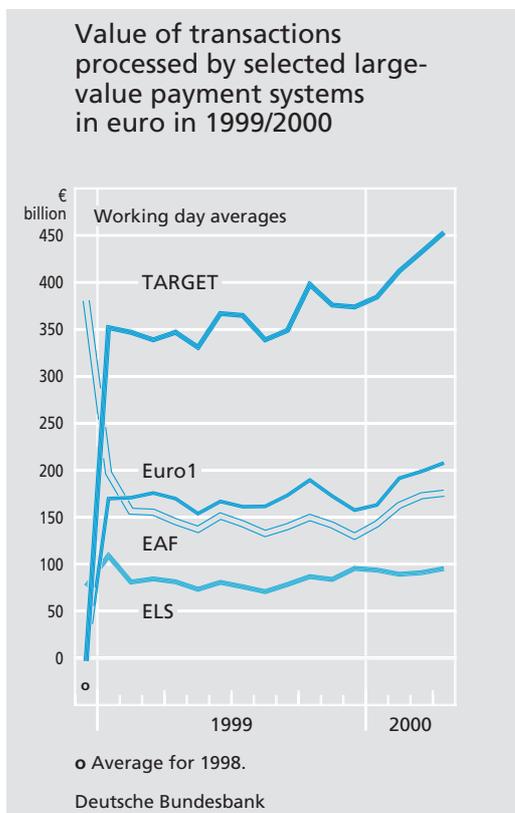
- First of all, there is the loss of the “home-field advantage” of the D-Mark. Transactions that formerly had to be processed via a German settlement system because of the currency can now be settled via other euro systems in other EU countries as well.
- Moreover, small and medium-sized euro-area correspondent banks have become independent in the settlement of their payments. They increasingly process their transactions directly using TARGET without involving any correspondent bank. Accordingly, a number of large German clearing banks have suffered noticeable reductions in their correspondent banking business.
- In addition, changes in the preferences among foreign banks have played a key role. Whereas foreign banks mainly used EAF to settle the DM transactions of the entire institution via their branches registered in Germany, the parent institutions now make use of alternative payment channels for the entire institution. A small but significant number of foreign EAF banks prefer the EBA’s Euro1 system and have thus largely stopped using EAF.

In spite of these developments, EAF has still remained one of the main players among the European clearing systems, even in the different euro environment. This owes something



to the fact that the EAF’s liquidity-saving approach, based mainly on the use of offsetting payment flows, has still proven to be attractive and functional, despite the decline in use.

It is not as if the EAF banks had not made a number of attempts to agree on the use of the payment systems before the start of Stage Three of EMU. This was designed to avoid unnecessary friction caused by an uncoordinated use of different payment systems. Unfortunately, they could not reach an agreement in all cases. The high-volume clearing banks still have different preferences for various reasons. In this context, the interests of various financial centres play a certain role, too. The acceptance of the large-value payment systems in euro, which form an indispensable foundation and framework for the



banks' liquidity-management and money market operations, is also a competitive factor.

Need for a strategic realignment on the part of the Bundesbank

The change in the underlying conditions, the decline in the number of payments processed via EAF and the increasingly European perspective assumed by major credit institutions, in particular, have ultimately motivated the Bundesbank to realign its strategy concerning large-value payment services rapidly and in a far-sighted manner. Had the Bundesbank assumed a wait-and-see attitude, this would have led to a vicious circle of increasing unit costs and higher prices, on the one hand, and further losses in the volume of payments, on the other. This development would be accelerated by adhering to national "standards" (e.g. with regard to data formats or commu-

nication standards), which in a European perspective has increasingly proved to be a barrier to efficiency.

The rather favourable developments in ELS have not rendered the aforementioned need for action obsolete, either. Up until now, ELS has largely been geared to national requirements and has only insufficiently been tailored to the needs of internationally oriented credit institutions. It thus cannot make up for the decline in EAF and the resultant cost deficit. In addition, the competitive momentum which is mainly affecting EAF today will sooner or later have an impact on ELS, too. One indication of this is the fact that the large credit institutions account for the lion's share of the business in ELS, too. As integration proceeds in the euro area, the incipient structural change will ultimately bring a breath of fresh air into the otherwise slow-moving national scene.

Developments in ELS

Moreover, the German TARGET component, which consists of a large number of local subsystems (such as ELS or the interlinking component) has a very complex structure. In order to meet the high expectations of market participants and to further enhance availability and throughput, fundamental changes in the technical design of the German TARGET component are indispensable.

Development of a gross system with liquidity-saving elements

Although the market shares of the leading large-value payment systems in euro – TAR-

*Concentration
of business
in the most
effective
settlement
systems likely*

GET, Euro1 and EAF – have remained relatively stable since the start of Stage Three of EMU, this cannot conceal the fact that in the long run European banks will not use several payment systems in euro which, in part, provide identical services. In addition, the segmentation of the total volume of payments in various systems makes it much more difficult to operate the payment systems in a cost-covering manner at competitive prices. Moreover, the available liquidity in euro must be split up into too many portions, which might impede the flow of funds in the various systems. Thus, business is likely to be concentrated in the best-performing and most economical systems. In addition, Europe-wide competition is already in full swing and has resulted in an improved functionality of payment products.

*Enhancement
recommendations
by major
Bundesbank
customers*

In this situation, the Bundesbank, as in the past, was able to rely on the active support and cooperation of its customers. At the very start of 1999, the then-EAF member forum, which consisted of eleven domestic and foreign banks with a large volume of payments, analysed the latest developments in euro payments and assessed the impacts that were to be expected over the medium term. The EAF member forum unanimously agreed to recommend that the Bundesbank develop a liquidity-saving RTGS system, thereby maintaining the specific advantages of EAF and ELS while concentrating them in an improved form in one system. In particular, the Bundesbank, as a payment services provider, was asked to comply with the following requirements:

- To offset the disadvantages resulting from the existing segmentation in ELS (little liquidity-saving effects, limited tools for liquidity management) and EAF (limited number of users, shorter business hours, no TARGET access, no real-time gross settlement option), particularly with regard to the required duplication of development work and expenditure for the Bundesbank and their customers resulting from the operation and use of two independent systems.
- Consistent single-transaction-oriented processing which facilitates the efficient internal treatment at the receiving credit institution.
- Usage of European standards, particularly “plain” S.W.I.F.T. data formats. These have already been implemented in many other European payment systems.
- Provision of interactive information and control options for users.

The alternative, i.e. to maintain the status quo of ELS and EAF for the time being, was rejected in view of the described scenario in European large-value payments. Moreover, the idea of moving EAF into position in the market as a pan-European clearing system, possibly in private ownership, was rejected due to the conflict of interests this solution would entail for the banks. In the Bundesbank’s view, other reasons not to pursue this approach were that a) the opportunity of a sensible consolidation would have been

*Requirements
posed by
the German
banking
industry*

passed up, and b) EAF would have potentially become a competitor of TARGET.

The main features of RTGS^{plus}

The recommendations of, and requirements demanded by, the German banking industry ultimately resulted in the conception of a new RTGS system, "RTGS^{plus}". In this process, representatives from all banking groups were involved right from the start. The chart on page 67 provides an overview of the system's most important features:⁴

European orientation through open access and use of home liquidity

The system is open to all credit institutions and securities firms registered in the European Economic Area (EEA). There are various flexible options for the daily provision and withdrawal of the liquidity required for settling payments which is held on specific RTGS^{plus} accounts. This "liquidity bridge" also includes transfers via TARGET.

Gross system with liquidity-saving elements

The incorporation of liquidity-saving elements in the gross settlement procedure of an RTGS system enables customers to organise their payment processing individually according to their preferences concerning throughput and liquidity savings. Up until now, liquidity-saving algorithms in RTGS systems – if any – have only been of minor importance.

Extensive liquidity management options

Each RTGS^{plus} participant can specifically manage the use of the liquidity he supplies according to his needs.

RTGS^{plus} provides extensive real-time information and makes it possible to modify all

control parameters interactively by using modern browsing technology.

Online information and interactive control

RTGS^{plus} uses internationally established S.W.I.F.T. standards for data formats and S.W.I.F.T. services in communication technology. SWIFTNet InterAct, a new, trend-setting service based on the latest Internet technology, is used for online information and interactive control.

Use of S.W.I.F.T. standards and services

The advantages of RTGS^{plus}

Since RTGS^{plus} is an integrated system, it allows its participants to make use of extensive synergies. The consolidation of the payment volumes previously split up into EAF and ELS and the single RTGS^{plus} liquidity pool alone make it possible to further improve payment throughput and liquidity usage. Initial simulations have confirmed this effect. In addition, customers will only have to operate one single S.W.I.F.T. interface to access the Bundesbank's single payment system; in many cases this interface is already in place and used to process foreign transactions.

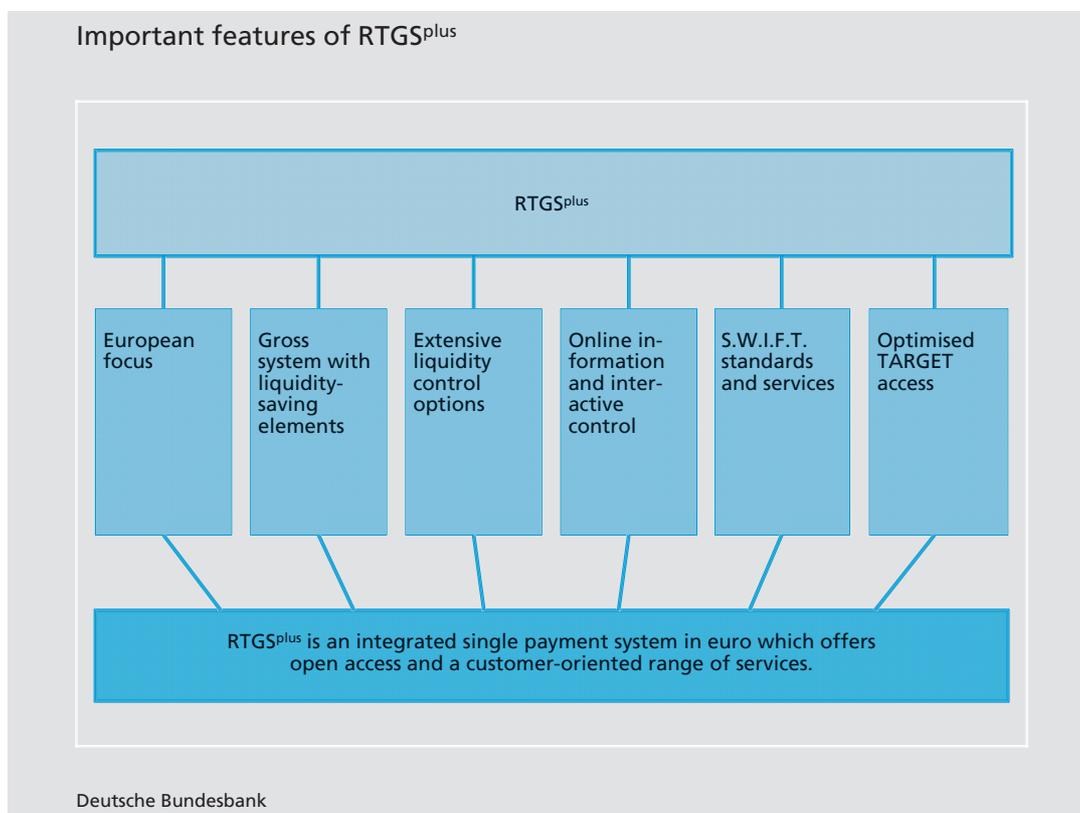
Synergies from integrated payment processing

RTGS^{plus} offers safe real-time gross settlement for all payments submitted. All payment instructions are immediately checked against the available liquidity in a single-transaction-oriented manner and settled with immediate finality if they are covered.

Safe and efficient payment processing

Payments for which no sufficient liquidity is available are placed into a queue. The differ-

⁴ Further information about RTGS^{plus} is available on the Internet at www.rtgplus.de.



ent intelligent mechanisms for the dissolution of the queue allow the payments to be processed in a liquidity-saving way while the time the payments remain in the system can be minimised. Just as in EAF, these mechanisms consist in the identification and simultaneous booking of bilaterally or multilaterally offsetting payment flows. The liquidity-saving settlement enables RTGS^{plus} customers to optimise their holdings of collateral, thereby reducing the corresponding opportunity costs. This will particularly be to the advantage of credit institutions – such as foreign banks – whose pool of collateral and minimum reserve holdings are relatively small.

*Efficient
liquidity
management*

There are two different types of payments in RTGS^{plus}, namely express and limit payments. Generally, both types of payments are pro-

cessed in the same way. In addition, they both use the single RTGS^{plus} liquidity pool. They differ from each other only in that express payments use the entire RTGS^{plus} liquidity available to the participant, whereas limit payments additionally take account of limits set by the sending participant.

The limits implemented in RTGS^{plus} are not to be confused with the debit caps used in net systems. Debit caps are designed to reduce the default risk by limiting a participant's maximum intra-day debit position. This is necessary in net systems because final settlement is usually not carried out until the end of the day. RTGS^{plus}, by contrast, works on a fully covered basis, which makes this kind of limitation measure irrelevant.

*Meaning of
limits in
RTGS^{plus}*

Therefore, the limits in RTGS^{plus} are only used for liquidity management purposes and are set by the senders themselves. The senders can thus determine the maximum amount of liquidity they are willing to use for limit payments, either generally or for individual counterparties. This makes it possible to avoid an uncontrolled outflow of liquidity. In many of today's systems this function is performed through decentralised management by the participant himself, i. e. the participant prioritises the payments to be submitted according to certain payment-specific criteria, such as purpose of use or amount. By contrast, the central implementation of such features is easier, more transparent and more efficient. Since the payments are predominantly held in central queues, mutual coverage dependencies can be taken into account more quickly and extensively. Other systems also permit the use of liquidity to be limited (though these options are less user-friendly). For example, they allow liquidity to be retained on separate accounts on a case-by-case basis or payments to be frozen in the system depending on their amount. In addition, it is possible in many EU countries to actively adjust the liquidity available for payment purposes by concluding specific repo transactions.

Furthermore, the positive experience gained with sender limits in EAF has shown that they promote the early submission of payments. This is a risk-free procedure for all banks involved as it limits the potential unilateral outflow of liquidity. Therefore, the limit system ultimately leads to a high degree of synchronisation of payment flows between the participants and thus minimises the need for liquid-

ity by making extensive use of mutual payment flows. Furthermore, it ensures a very early finality of the payments submitted and promotes a fair behaviour within the community of participants.

In addition, the option of adjusting the limits at any given time allows unforeseen situations to be handled quickly and undesirable delays in payment processing to be overcome rapidly.

RTGS^{plus} participants are not compelled to set limits. Small institutions, in particular, may waive this option if they see no need for it in view of their business volume or if they do not consider dedicated liquidity management to be necessary for cost-benefit reasons.

Optional limits

The innovative online information and control features allow RTGS^{plus} participants to keep a clear picture of their current and potential liquidity positions – at all times and in a very user-friendly way – and to obtain a wide range of information on individual payments or categories of payments (e.g. by viewing queues for incoming and outgoing payments). The up-to-date information and the extensive control options by means of a mouse click or a keystroke give the participants the possibility of comprehensively assessing their liquidity status and of arranging the processing of their RTGS^{plus} payments in a farsighted and demand-oriented way. This is of particular importance for those credit institutions participating in several large-value payments systems simultaneously. In this respect, the online information and management options supported by RTGS^{plus} may also

contribute to a smooth payment processing in other systems.

TARGET and RTGS^{plus}

Disadvantages of TARGET

In spite of the market success of TARGET, it is an undisputed fact that, technically speaking, the current structure of TARGET is not an optimal solution. The TARGET network consisting of 16 independent systems has two basic flaws. One is that the technical heterogeneity stemming from the individual national RTGS systems (including the national interlinking components) impairs the stability of the overall system. The very time-critical payment instructions with a high average value call for a high level of availability. This requirement was clearly emphasised by TARGET users in a recent survey.⁵ The other is that the decentralised structure and the heterogeneous scope of services offered by the various national access systems restrict the options for providing information and supporting the liquidity management of internationally oriented banks. However, enhancements as substantial as these require a technical consolidation – and ultimately the technical centralisation of payment processing. This could also contribute to a reduction in costs (of developing and operating a variety of RTGS systems) and act as a counterweight to a further increase in the system's complexity, with EU enlargement being just a matter of time.

RTGS^{plus} will serve as the German TARGET access, a feature in which it will replace ELS. RTGS^{plus} is therefore not to be seen as a competitor of the TARGET system; rather, it is an

integral part of it. RTGS^{plus} enables the quality of the German TARGET component to be distinctly improved and makes access to the overall European TARGET system far more attractive.

- RTGS^{plus} ensures a high degree of availability through state-of-the-art IT design, efficient fault management and maximum backup capabilities.
- The use of S.W.I.F.T. standards, which are also used in TARGET, helps avoid fractures and also ensures a further convergence of national and cross-border EU payments.
- RTGS^{plus} optimises the processing of TARGET payments and also enhances the ease of use for customers submitting TARGET payments.

In the meantime, a debate has started in the European System of Central Banks about the further development of TARGET. The modernisation of the TARGET sub-component RTGS^{plus} on the basis of explicit customer requirements will strengthen TARGET as a whole and is intended to provide important ideas for the future enhancement of the overall TARGET system. To that extent, RTGS^{plus} is also supported by the ECB. The inclusion of liquidity-saving elements and the extensive information-providing options, for example, comply with the requirements of large European banks with regard to an efficient and competitive payment system. This was also made clear at a recent meeting of the ECB,

*Debate about
enhancement
of TARGET*

⁵ See: European Central Bank, Cross-border payments in TARGET: A users' survey, November 1999.

the national central banks and major market participants, including the European banking associations. Other central banks likewise are considering enhancing their systems, such as CHAPS Euro, the UK RTGS system. By putting its plans for RTGS^{plus} on the table right from the start, the Bundesbank has furthered the debate about the future design of RTGS systems and TARGET. However, in view of the difficult political decision-making process, practical results, i.e. a completely revised or even newly designed TARGET system, are not to be expected until 2005 at the earliest. Owing to its modular design based on international standards, RTGS^{plus} is flexible enough to match well with the envisaged TARGET enhancement. In addition, RTGS^{plus} could promote the desirable harmonisation through its attractive remote-access options for foreign banks or, even better, strategic alliances with other central banks or groups of banks outside Germany.

Implementation and migration

*Early availability
by mid-2001*

In order to ensure that the new payment system will succeed in the market, it must be implemented rapidly. The Bundesbank has scheduled RTGS^{plus} to be put into operation in mid-2001. The very ambitious schedule for the launch of RTGS^{plus} requires all available resources to be focused on this project so that work on the project, in parallel to the customers' implementation activities, can be completed on time.

In all stages, from design to operation, the Bundesbank has been closely cooperating

with the banking industry in a spirit of partnership. To this end, a multi-staged, tight project management has been set up to ensure that RTGS^{plus} achieves its strategic, business and technical project objectives. In addition, the Bundesbank's most important payment customers have expressed their support for the project by making a statement that they would use RTGS^{plus}.

*Close
cooperation
with the
banking
industry*

In addition to the demand-oriented functionality, an optimum of availability, throughput and support are of paramount importance to customers. On a technical level, this means reducing the complexity of the software to a minimum and completely redesigning the German RTGS system in technical terms with a view to achieving a lean system optimally geared to the required functionality. In operational terms, the RTGS system must – as far as possible – be detached from other procedures. Moreover, the customer relationship requires comprehensive and intensive support, ranging from consultation before and during project implementation on day-to-day operations to the handling of problems and complaints.

*Technical and
operational
implications*

EAF will close down as soon as RTGS^{plus} is launched. Credit institutions not immediately participating in RTGS^{plus}, however, will still be able to use ELS, albeit as an access procedure to the Bank's large-value payment system. However, in the long run it will be uneconomical both for the Bundesbank as a system operator and for the banking industry as a user to operate ELS in parallel. For this reason, it is indispensable to concentrate on RTGS^{plus} as a single interbank system for individual pay-

*Range of ELS
services will
continue to be
provided for a
transitional
period*

ments. The Bundesbank and the banks are currently trying to find suitable and cost-ef-

fective ways for all ELS banks, including the smaller ones, to participate in RTGS^{plus}.

