

CHAPTER 10

Retail payment systems

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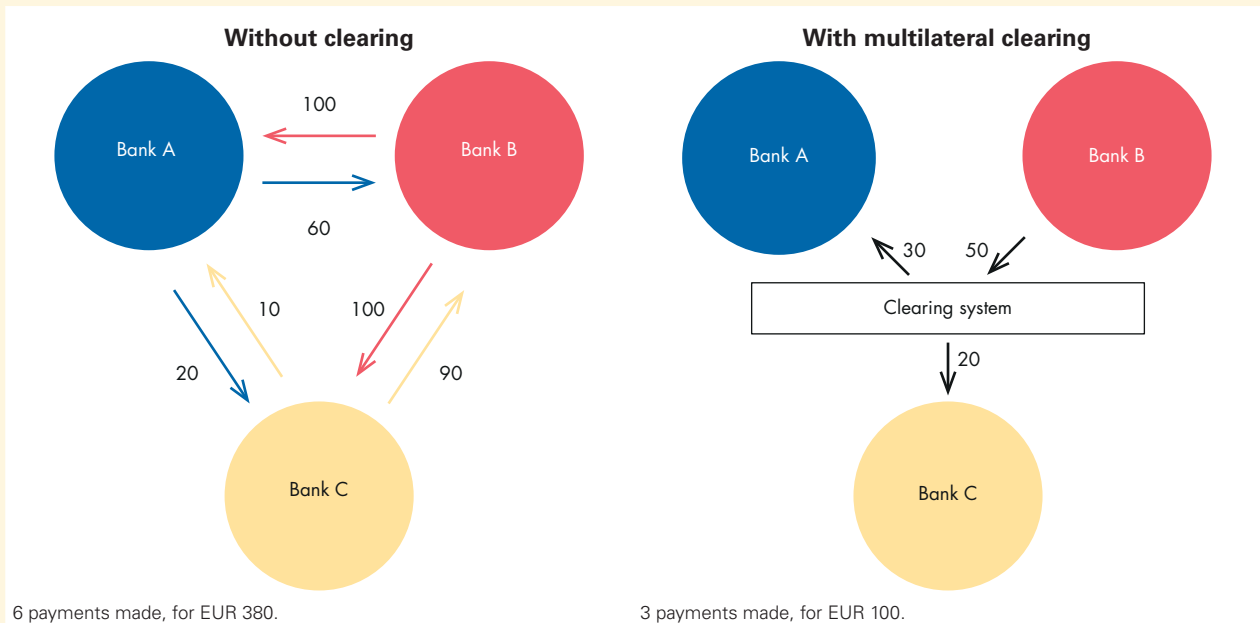
Retail payment systems play a key role in the economic sphere, handling payment transactions for retail customers and corporates. They typically process large volumes of low-value payments. The landscape in which these systems operate in Europe has evolved significantly over the last decade with the introduction of the European format (SEPA) for credit transfers and direct debits, but it remains relatively fragmented. New developments are now underway with the arrival of instant payments. The first section of this chapter presents the challenges, background and functioning of retail payment systems, together with their development, both to the present day and underway. The second section focuses on the payment system landscape in Europe, the third on financial risks in retail payment systems and the fourth on the oversight framework established by the Eurosystem for retail payment systems.

1. Retail payment systems and the challenges they face

Retail payment systems process “retail” payment orders (credit transfers, direct debits, cheques, cards, etc.). In contrast with large-value payment systems, they typically handle non-urgent payments that are relatively low in value but high in volume between retail customers and businesses in the broad sense. These systems often provide clearing services to reduce the number of interbank payments required. Clearing is usually performed on a multilateral basis: the system calculates the net balance payable or receivable by each participant based on all the transactions processed during the period considered (usually one day).

Payment clearing is an old technique (see Box 2). Originally, payment orders were exchanged and cleared manually in “clearing houses”. Physical clearing was practised at the time when paper-based

Box 1: An example of payment order clearing



Box 2: The history of France's retail payment system

In France, the first clearing house for the exchange of means of payment dated back to 1872 and was used for cheques. It was the Paris bankers' clearing house, developed with the support of the Banque de France to reduce the large number of transactions involved in settling payments with the payment instruments in use at the time, namely bills of exchange and cheques. This clearing house enabled bankers to physically exchange the paper instruments with a view to paying only the net balances resulting from their transactions.

A hundred years later, with the emergence of electronic and automated payments, manual clearing remained in use alongside automated clearing processes performed in dedicated systems. Gradually, automated systems began to take over. In the 1980s retail payments were processed by:

- 104 "traditional" clearing houses for exchanges of paper-based payment instruments, most of which took place on the Banque de France's premises;
- 9 clearing computers for the exchange of transactions using magnetic media;
- 9 regional centres for the exchange of cheque images, enabling low-value cheques to be collected in the form of cheque images.

In 1983, French banks decided to streamline this structure by launching a project to create a single automated exchange system known as SIT (*Système Interbancaire de Télécompensation* – interbank remote clearing system). SIT entered into operation in 1992 and progressively took over from the clearing computers, replacing them completely in 1994.

SIT was operated by GSIT (*Groupement pour un Système Interbancaire de Télécompensation*), an economic interest group (GIE) comprising the major French banks and the Banque de France. It relied on a network of processing centres connected bilaterally via a private network. At the time, SIT was a highly sophisticated system, being the first in the world to provide end-to-end processing of payments (acquisition, clearing, settlement and the forwarding of accounting information).

Following on from the initial migration to SIT of paperless means of payment (credit transfers, direct debits, etc.), payments by bank card (1995-1996) then cheques (2001-2002) gradually migrated to the system. Before cheques could benefit from automated clearing, a processing method had to be put in place to speed up the clearing process without inflating management costs. The shift to cheque images¹ made this possible. Legislation on cheque images comprises several texts, including the Law of 13 March 2000, which gave legal recognition to electronic-based writing.

In July 2002, all interbank exchanges were processed electronically in SIT. In September 2002, the system processed more than 45 million transactions a day on average, with an average daily value of EUR 18 billion.

In 2004, in anticipation of SEPA,² six French banks (BNP, Caisses d'Épargne, Crédit Agricole, Crédit Mutuel, Banques Populaires and Société Générale) decided to set up a private company tasked with developing and operating a reference clearing platform for retail payments in Europe. As a result,

¹ Cheque images are created from cheques physically submitted by customers to their banks, which are then digitised. The beneficiary's bank sends the cheque image electronically, including the MICR line and amount, to be cleared in the payment system.

² See Section 1.2.

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the company STET (*Systèmes Technologiques d'Échanges et de Traitement*) was founded and became the operator of the retail payments system CORE(FR). Progressively, CORE(FR) replaced SIT, which ceased operations in October 2008.

As technology continued to advance and payment platforms were modernised, centralised multilateral clearing remained the system of choice. At the same time, the French operator STET SA adapted its services so that it could process SEPA instruments and instant payments.

France currently has two payment systems operated by STET SA: CORE(FR) and SEPA.EU. Each of these systems meets distinct needs. The first is designed as a national payment system, while the objective for the second is to be used on a pan-European scale.

CORE(FR): a dedicated national payment system

The project came to fruition in 2008 with the migration of all transactions previously cleared in SIT to the CORE(FR) system. The new system provided a single multilateral clearing process for all means of payment. Transactions are processed on a continuous basis with a single clearing cycle. A financial security mechanism, comprising a common guarantee fund and individual guarantees, increases the certainty that the system will settle. Settlement takes place once a day in TARGET2. Direct participants are connected to the system via a private secured network. The system's operational resilience is ensured by the use of two production sites. STET operates the technical platform and the secure messaging network directly.

As of 31 December 2016, the CORE(FR) system had 10 direct participants – the shareholder banks, together with HSBC France, the Caisse des Dépôts et Consignations, Crédit Mutuel-Arkéa and the Banque de France – and 177 indirect participants.

With more than 50 million transactions processed each day, for a value of over EUR 20 billion, in 2017 CORE(FR) remains Europe's largest retail payment system based on volume (12.5 billion transactions) and second based on value (EUR 4,800 billion in transactions cleared) after EBA Clearing's STEP2-T system (see below).

SEPA.EU: the development of a pan-European service

As well as the French payment system CORE(FR), the technical platform developed by STET hosts the Belgian banking community's payment system, CEC (*Centre d'Échange et de Compensation*). The CORE platform was actually developed to meet the specific needs of other exchange communities, while benefiting from the economies of scale provided by a shared platform.

Alongside this development strategy, STET created a payment system targeting the pan-European market, so as to diversify its revenue sources and provide an alternative to the services offered by rival pan-European payment systems. SEPA.EU has been operational since 21 November 2016, with the French community's migration to SEPA direct debits. In 2020, the system will handle the SEPA transfers currently cleared in CORE(FR) and open its services up to non-French participants. STET is also developing a dedicated service for instant transfers in SEPA.EU, which should be operational in 2019. In 2017, SEPA.EU processed between 196 million and 229 million transactions a month, with overall monthly values ranging from EUR 74 billion to EUR 106 billion.

payment instruments were the norm. These physical systems were gradually replaced by automated systems in the 1970s, paving the way for electronic payment systems to develop, spurred by the shift to paperless means of payment, advances in IT and technological innovation.

The payment system landscape continues to evolve as new technologies and means of payment emerge. Taking a broader perspective, the creation of the single euro payments area (SEPA) disrupted the ecosystem of payment systems built around their national banking communities, with the emergence of pan-European players and the development of interoperability links.

1.1. Operation of retail payment systems

Unlike real-time gross settlement systems (RTGS), which are designed to process large-value and/or urgent payments, retail payment systems generally process transactions submitted by participants during the payment cycle on a deferred net settlement (DNS) basis.

Interbank retail payment systems are the preferred channels for the exchange and clearing of payments. In France,

in 2015, these channels handled 74% of payments based on volume, versus 16% for intra-bank channels (within the same institution), 9% for intra-group channels (within the same banking group) and 1% for interbank transactions executed outside payment systems (correspondent banking, see Chapter 6). The distribution of payments processed based on value – with and without multilateral clearing – is shown in the Chart 1:¹

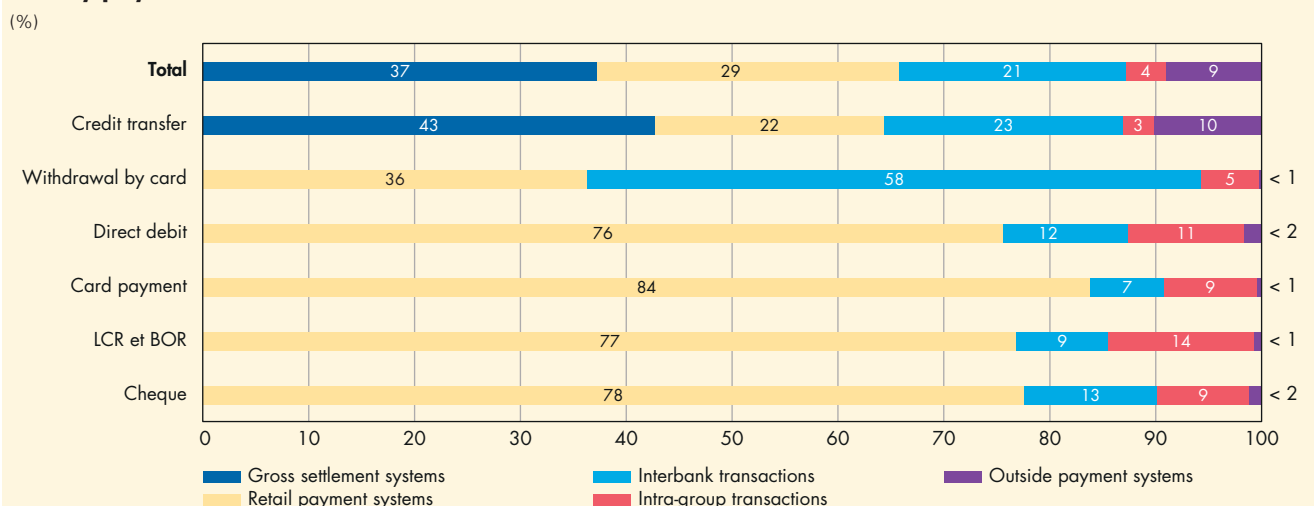
A retail payment system has both direct and indirect participants:

- direct participants execute transactions directly with other participants;
- indirect participants channel their transactions through a direct participant.

In the European Union, direct participants in a system are accountable to the settlement agent (or all other participants) for the execution of their own payments, the payments of their clients and those of their indirect participants. When a new payment system is established, it must be notified to the European Commission as a system subject to Directive 98/26/EC on Settlement Finality. Under this Directive,

¹ https://www.banque-france.fr/sites/default/files/media/2017/04/05/bilan-cartographie-des-moyens-de-paiement-2016-donnees_2015.pdf

C1 : Breakdown of 2016 payment transactions executed within and outside payment systems by payment instrument in value terms



Source: Banque de France.

settlement systems are defined as formal arrangements between three or more participants (essentially credit institutions and investment service providers), without counting a possible settlement agent (for the final accounting of such settlements), a possible central counterparty or a possible clearing house, with common rules and standardised arrangements for the execution of settlement orders between the participants. This “Finality” directive was amended on 6 May 2009 by Directive 2009/44/EC in order to extend its scope of application and increase the protection provided in a context where links are developing between payment and settlement systems. The new directive also extended the protection provided in the event of a participant’s failure to cover not only settlement orders exchanged between participants in the same system, but also those exchanged between different systems.

Settlement cycles are defined on the basis of each system’s specific rules. Therefore, during its daily operating hours a system can include a single settlement cycle or several such cycles. A settlement cycle generally involves several stages. For example, France’s CORE(FR) retail payment system operates in the following stages:

- (i) it begins with an **opening period**, during which participants submit their transactions to the system. At the end of this period (the cut-off time), either the system is closed and no further transactions are accepted or further transactions are accepted but will only be eligible for processing during the following clearing cycle, which can be on the same day (D) or the following day (D+1);
- (ii) the system computes each participant’s multilateral net balance and informs participants thereof, allowing for a **validation period** during which participants can check their respective balances payable/receivable and dispute them if necessary;

- (iii) at the end of stage ii, participants with negative net balances are required to deposit funds in their settlement accounts so that the system can settle their transactions. This is known as the **information period**, during which instructions for settlement in TARGET2 are established;

- (iv) the **settlement period** then begins, with transactions being settled in TARGET2. On completion of this stage, the operator forwards the relevant accounting information to participants.

The Box 3 shows the settlement cycle of France’s national retail payment system CORE(FR), operated by STET SA, during a typical payment day.

In CORE(FR), after the cut-off time by which clearing balances must be validated by direct participants (14:30 CET), an information period begins at 14:45. Instructions for the settlement of participants’ clearing balances and the restitution of individual guarantees are sent to the settlement agent (TARGET2). The settlement period in TARGET2 runs from 15:05 to 15:15.

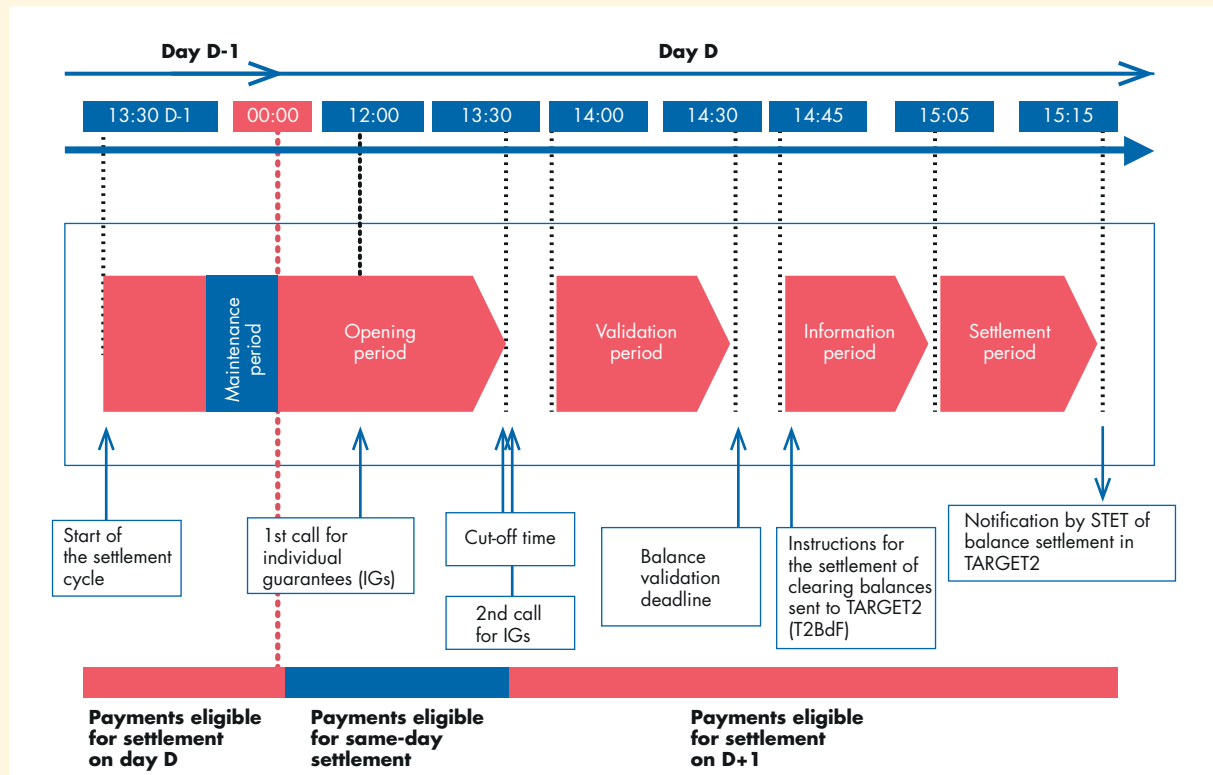
Payment systems must provide payment finality – rendering payments irrevocable and unconditional – no later than the time of settlement. Participants’ net positions are generally settled in central bank money,² i.e. on the books of the central bank, as is the case for France’s CORE(FR) system, which settles participants’ net balances in TARGET2. Settlement using central bank money is highly recommended as it eliminates the settlement risk associated with a default by the settlement bank (see Chapter 17). Therefore, within the euro area most retail payment systems, like the French systems CORE(FR) and SEPA EU, settle their participants’ net positions in TARGET2³ (see Chapter 7).

In this type of system it is also possible for transactions to be settled in commercial bank money (see Chapter 1, Section 3) on the books of a credit institution, in

² In the euro area, pursuant to amended Regulation (EU) 795/2014, PFMI 9 on settlement in central bank money is applicable to systemically important payment systems (SIPS) and prominently important retail payment systems (PIRPS). For other retail payment systems (ORPS), settlement in central bank money is not mandatory (for more details see section 4.2).

³ BIS, “Payment, clearing, and settlement system in the euro area”, CPSS, Red Book, 2012. <https://www.bis.org/cpmi/publ/d105.htm>

Box 3: A typical payment day in the CORE(FR) system with a single payment cycle



Source: STET SA, Banque de France.

accordance with strict conditions for the management and control of the risks inherent in this type of settlement.

1.2. The impact of SEPA on retail payment systems

The single euro payments area (SEPA) was established by a group of major banks comprising the European Payment Council (EPC), with support from the ECB and the European Commission. Initiated in 2002, the project aimed to harmonise means of payment in euro across the 34 countries in the SEPA area⁴ so that cross-border payments in euro could be handled as quickly and securely as domestic payments and under the same conditions. SEPA thus supplemented the introduction

of the euro currency in 18 European countries. The first SEPA implementation stage was the launch of the European credit transfer (SEPA Credit Transfer or SCT) on 28 January 2008. Following the adoption of the SEPA Regulation (EU) 260/2012⁵ – known as the “end-date” regulation because it set a deadline for discontinuing domestic credit transfers and direct debits – the migration to the SEPA credit transfer (SCT) and SEPA Direct Debit (SDD) became effective on 1 August 2014. The replacement of domestic by European means of payment changed the payment system landscape, creating the conditions for Europe-wide competition in the retail payment market. This shift logically involved the introduction of specific requirements for payment systems.

⁴ The SEPA area comprises the 28 Member States of the European Union, together with Iceland, Norway, Switzerland, Liechtenstein, Monaco and San Marino.

⁵ <http://eur-lex.europa.eu>

1.2.1. SEPA requirements applicable to payment systems

The requirements applicable to payment systems in connection with SEPA are set out in the abovementioned Regulation (EU) 260/2012. It stipulates that operators must ensure that their payment system is technically interoperable⁶ with the other systems operating in the European Union and must not adopt business rules that restrict interoperability if they are not justified on the grounds of security. The Banque de France is the competent authority responsible for ensuring that this requirement is met by the operators of payment systems established in France, namely STET SA for the CORE(FR)⁷ and SEPA.EU systems and EBA Clearing SAS for the STEP2-T system.

Acting in its capacity as a catalyst, in 2013 the Eurosystem published the SEPA terms of reference for retail payment systems. They include and supplement the requirements laid down by Regulation 260/2012, which establishes four criteria to define the Eurosystem's long-term vision for the clearing and settlement of SEPA payments. Each of these criteria refers to a series of questions that payment system operators are invited to answer in order to assess their level of compliance. They include requirements for systems to:

- have the technical and operational capacity to process payments in compliance with the standards set by the EPC;
- be fully interoperable with the other systems by means of direct or indirect links;
- give participants access to all SEPA-compliant counterparties;
- ensure freedom of choice among payment service providers, based on the quality and cost of the clearing and settlement solutions they provide.

1.2.2. The European payment system landscape following migration to SEPA

Almost four years after the migration to SEPA credit transfers and direct debits, the European payment system landscape allows greater integration of SEPA transaction processing. This is because banks and other payment service providers are increasingly using the pan-European system STEP2-T operated by EBA Clearing. Alongside the migration of credit transfers and direct debits to the SEPA standard, STEP2-T, created in 2003, has become the leading retail payment system in the euro area based on value. As well as increasing its share in the market for cross-border payments, STEP2-T has also gained market share from national systems used for domestic SEPA payments.

However, few changes have been made and the market remains fragmented, with a multitude of national systems operating alongside their pan-European counterparts. This means that banks usually have to participate in several systems to ensure that they are reachable⁸ by any other counterparty involved in SEPA payment transfers.

While regulators have looked closely at interoperability links between systems, in terms of concrete action, little has been achieved. Low volumes of cross-border transactions, coupled with technical and legal obstacles to inter-system links, have put the brakes on initiatives in this area. At present, only 25 interoperability links are in place among the 37 retail payment systems in operation in the euro area (see Box 5 below).

1.3. The launch of instant payments in the euro area

Following migration to SEPA, the Eurosystem wanted the market for retail payment systems in euro to advance towards greater integration. In view of this, the Euro Retail Payments Board (ERPB),

6 Two payment systems are interoperable if the payment instruments processed in one system can be used in the other. Interoperability requires not only technical compatibility but also a commercial agreement between the systems concerned.

7 As long as the CORE(FR) system processes SEPA transactions (see Box in Section 1).

8 A bank is said to be reachable if it has the operational capacity to receive SEPA payments via one or more payment systems, i.e. if the bank is a direct or indirect participant in these payment systems.

set up in December 2013 to replace the SEPA Council and chaired by the ECB, set out to identify factors conducive to a more integrated market. In view of the changes underway in technology and consumer expectations, especially with the rise of e-commerce, instant payments have been identified as a powerful vehicle for integration.

In 2014, the ERPB provided an initial definition of “instant payments” as *“electronic retail payment solutions available 24/7/365⁹ and resulting in the immediate or close-to-immediate interbank clearing of the transaction and crediting of the payee’s account with confirmation to the payer”*. In contrast, payments made via “classic” SEPA credit transfers and direct debits (SCTs and SDDs) or by card are only settled (i.e. credited to the payee’s account) on the day after the payment order is submitted (D+1). With instant payments, the payee’s account is credited within a few seconds of the issuer informing its bank of its intention to pay. Instant payments, which allow the funds credited to be reused immediately, are already operational at the national level in several countries, particularly in Europe.¹⁰ The first cross-border solution is the RT1 system operated by EBA Clearing, launched in November 2017. At the end of June 2018, RT1 had 22 participants and was processing more than 10,000 transactions a day on average.

After the ERPB tasked the EPC with rapidly developing a scheme (defined as a set of rules and standards of use) for European instant payments, the EPC built on the existing SCT to develop an instant payment scheme in the form of a credit transfer: SCTInst. The EPC submitted a draft scheme to the ERPB in November 2015, describing the SCTInst transaction process and setting out the requirements to be satisfied by participants and payment service providers (PSPs) in terms of controls and reporting. The scheme can be adopted on a voluntary basis. Several operators have used SCTInst to develop instant payment solutions. Notable examples include EBA

Clearing with its RT1 system and STET, the CORE(FR) system operator, with its new system SEPA.EU, which is open to Europe’s banking communities and will be available to process instant payments from the end of 2018.

The arrival of instant payments will force payment system operators to review their technical infrastructures, in some cases very thoroughly, especially as the Eurosystem has expressed specific expectations, notably in terms of admission policies, interoperability and risk reduction.¹¹

Instant payments thus represent a pan-European challenge and the Eurosystem wants to take the opportunity to spur further integration of the euro area payment market. In view of this, the ECB has also decided to launch an instant payment solution, TIPS (TARGET Instant Payment Settlement). TIPS will process instant payments between two of its participants directly, using the ASI6 RT (real-time) procedure to settle them in TARGET2 (see Chapter 7, Section 6 for details), thus removing barriers between retail payment systems and large-value payment systems.

With this solution, working closely with the banking industry, the Eurosystem wants to ensure that demand for instant payments will be satisfied at the European level. The TIPS service is expected to go live in November 2018.

2. The principal retail payment systems in Europe

A wide range of retail payment systems are in operation across the euro area. As of end-2016,¹² there were 37 payment systems overall, including four SIPS – two of which are retail payment systems – one large-value payment system (“non-SIPS LVPS”), nine PIRPS and 23 ORPS.¹³ All the PIRPS and ORPS are retail payment systems (for the definition of SIPS, PIRPS and ORPS, see Section 4.2. below). The list of payment systems in the Eurosystem

9 24 hours a day, 7 days a week, 365 days a year.

10 For example, Swish in Sweden, MobilePay in Denmark, and Faster Payments Service (FPS) in the UK.

11 <https://www.ecb.europa.eu>

12 SDW report, payment statistics, September 2016, ECB.

13 SIPS (Systemically Important Payment System), PIRPS (Prominently Important Retail Payment System) and ORPS (Other Retail Payment System): <https://www.ecb.europa.eu/paym/pol/activ/systems/html/index.en.html>

is updated annually and published on the ECB's website.

Payment traffic is nevertheless concentrated in a limited number of retail payment systems. In Europe, for instance,

the three largest systems in value terms, namely STEP2-T, Bacs (UK) and CORE(FR), process almost 72% of the total value of payments cleared. The percentage climbs to 83% if the five largest systems are considered.

Box 4: List of payment systems in use as of end-2016

Country	SIPS (4)	Non-SIPS LVPS (1)	PIRPS (9)	ORPS (23)
Pan-European	TARGET2			
Pan-European	EURO1			
Pan-European	STEP2-T			
Germany				RPS (EMZ)
Germany				STEP2-CC
Austria			Clearing Service Austria	Clearing Service International
Belgium			CEC	
Cyprus				Cyprus Clearing House
Cyprus			JCC Payment Card System	JCC SDD
Spain			SNCE	
Estonia			Local clearing system for card payments	
Finland		POPS		
France	CORE(FR)			SEPA.EU
Greece			Dias	ACO
Ireland				IPCC
Italy				CSM Banca d'Italia
Italy				ICBPI-BICOMP
Italy				ICCREA-BICOMP
Italy				SIA-BICOMP
Latvia				Electronic Clearing System EKS
Latvia				Local clearing system for card payments
Lithuania				SEPA-MMS
Malta				Malta Clearing House
The Netherlands				Equens CSM
Portugal			SICOI	
Slovak Republic			SIPS (Slovak Interbank Payment Systems)	First Data Slovakia
Slovenia			SIMP-PS	Multilateralni kliring Activa
Slovenia				Plačilni sistem Moneta
Slovenia				Poravnava bankomatov
Slovenia				Poravnava kartic
Slovenia				Poravnava Multilateralnega kliringa MasterCard

Box 5: Retail payment systems: examples from European countries other than France

Pan-European systems in the euro area: EBA Clearing, domiciled in France, operates the STEP2-T retail payment system for SEPA transactions. The system was launched in 2003 and its traffic increased sharply with the migration to SEPA.¹ Since 2013, it has been the leading retail payment system in Europe based on value, having cleared EUR 13,169 billion in transactions in 2016, well ahead of the French national system, CORE(FR), with EUR 5,513 billion.

Change in the value of transactions processed by STEP2-T and CORE(FR)

(annual values, in EUR billion)

	2010	2011	2012	2013	2014	2015	2016
STEP2-T	2,385	2,984	3,511	4,748	11,072	12,217	13,169
CORE(FR)	5,119	5,373	5,405	5,376	5,373	5,540	5,513

Source: ECB (2017 Oversight Report, Appendix: https://www.ecb.europa.eu/pub/pdf/other/eurosystemoversightreport2016_en.pdf?2ae0c243b5cab226b6d21c0115dbf609)

The system provides various settlement services, depending on the SEPA payment instrument used: STEP2-T SCT for SEPA credit transfers, STEP2 SDD for SEPA direct debits and SDD B2B for SEPA direct debits between businesses. At the end of December 2015, these services had 131, 98 and 85 direct participants, respectively. STEP2-T has multiple payment cycles. The SCT service operates in five daytime cycles and two optional night-time cycles. Participants can submit their payments for settlement during any of these five cycles but must be ready to settle the payments due for each cycle. The SDD service operates two separate settlement cycles (between 12:00 and 12:45 for Core SDD and between 13:00 and 13:45 for B2B SDD). Like most retail payment systems, STEP2-T operates on a deferred net settlement basis, whereby participating banks settle their transactions by paying their multilateral net balance in TARGET2. The operator notifies participants of their bilateral gross obligations and calculates their multilateral net balances, which are transmitted to TARGET2 via a dedicated interface (ASI).² In STEP2-T, payment orders are transmitted to the beneficiary banks after settlement (“delivery after settlement”) and are only accepted for settlement if they have been funded (i.e. if the issuing or debtor banks have sufficient funds in their accounts). Payments are considered final once settlement has taken place. In 2016, STEP2-T processed around 10.2 billion transactions representing an overall value of EUR 13,169 billion.

In Belgium, the *Centre d’Échange et de Compensation* (CEC) is the interbank payment system used for retail transactions. It centralises and coordinates the bulk of domestic low-value cashless payment traffic between individuals, companies and public authorities. Since March 2013, all domestic payments (Belgian formats) and SEPA credit transfers (SCT) have been processed on the CORE technical platform operated by STET, the operator of the French retail payment system CORE(FR). Alongside the migration to SEPA, the Belgian banking community launched a request for proposals to provide instant payment processing. STET was chosen as the supplier of the technical platform. In 2016, the CEC processed 1.385 billion transactions, representing an overall value of around EUR 919 billion.

¹ Several European banking communities, notably those of Germany and Italy, decided to process their SEPA payment flows in STEP2-T.

² Ancillary System Interface. TARGET2 has several interfaces with different operational modes to settle the net balances of ancillary systems.

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In Germany, most retail payments are cleared under bilateral settlement agreements between banks within the “Giro” network³ populated by the German banking system’s three key institutions (commercial banks, savings banks and cooperative banks). Alongside this system, the Bundesbank operates a payment system for retail transactions (EMZ),⁴ especially those in the SEPA format (SCT, SDD) and cheques.⁵ For this purpose, it is connected bilaterally with other European SEPA-compliant automated clearing houses (ACH). At present, more than 220 banks domiciled in Germany use the EMZ system, including 156 direct participants in the SEPA service. In 2016, EMZ processed around 4.3 billion transactions, with a total value of around EUR 3,100 billion. The value processed in the system is low compared with the EUR 5,542 billion handled by CORE(FR) in 2016. This reflects German banks’ extensive use of bilateral settlement agreements, as well as the fact that they are much heavier users of the pan-European STEP2-T system than their French counterparts.

In the Netherlands, Equens is the company that operates the two Dutch retail payment systems. Domestic non-SEPA payments are processed in the clearing and settlement system (CSS)⁶ and SEPA payments are handled by Equens CSM.⁷ Equens was set up in 2006 by a merger between Interpay Nederland BV and the German institute for payment service transactions (*Deutsches Transaktionsinstitut für Zahlungsverkehrsdienstleistungen*). Since 2008, Equens has had European Company status (Equens SE). All Dutch retail banks participate in Equens for domestic transactions (CSS). They can, like all institutions holding banking licenses in other European countries (EU and EEA), participate in the clearing of SEPA instruments. In 2016, Equens processed 1.8 billion transactions with an overall value of EUR 1,764 billion.

In Italy, BI-COMP is the clearing system used for retail payments in euro (cheques and credit transfers), as well as SEPA transactions (SDD, SCT). The system is operated by the Banca d’Italia and its transactions are settled in TARGET2. The central bank provides participants with an interoperable service that allows their payment instructions to be executed in other connected systems. BI-COMP is interoperable with Equens, STEP2-T and CS.I.⁸ In 2016, BI-COMP processed around 847 million transactions with an overall value of EUR 1,154 billion.

In the UK there are three retail payment systems: Bacs, Faster Payment Service (FPS) and Cheque and Credit Clearing (C&CC). Bacs is the largest domestic retail payment system based on volume. It handles low-value and/or non-urgent electronic debit/credit transactions (direct debits and bank transfers) for payments in pounds sterling and domestic euro payments.

Bacs Ltd is the system’s operator but it outsources processing operations to VocaLink Ltd. Bacs counts 70 financial institutions as members. In 2005, the system introduced affiliate status for members. Affiliates participate in the system’s various governance bodies but do not assume operational responsibilities for settlement. In 2016, Bacs processed 6.2 billion transactions with a total value of GBP 4,800 billion.

FSP is an automated clearing and settlement system used to process instant transfers, forward-dated transfers and standing orders for UK retail customers and companies. The system is administered

3 The Giro is a bank transfer in which the recipient is not actively involved. The beneficiary provides their banking details to the order originator, who can then transfer the required amount to the account of the beneficiary, who need not take any action. The order originator is then notified that the payment has been successfully completed. This type of transfer is very common in Germany, where cheques are rarely used.

4 *Elektronischer Massenzahlungsverkehr*.

5 Cheques and SDD make up almost 60% of EMZ’s traffic (based on volume).

6 Clearing and Settlement System.

7 Clearing and Settlement Mechanism.

8 Clearing Service International, a system operated by the Oesterreichische Nationalbank (OeNB, the central bank of Austria).

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by FPS Ltd and operates 24/7/365. Its processing operations have also been outsourced to VocaLink Ltd. FPS is a deferred net settlement system with three interbank settlement cycles each day. The Bank of England acts as the settlement agent. A limit of GBP 100,000 applies to individual transactions and all FPS members have a debit limit (“Net Sender Cap”) and are subject to a loss-sharing agreement if a participant defaults.

C&CC is the system used to process cheques and bank giro transfers. It settles transactions in a number of currencies (GBP, EUR and USD) and has 10 direct participants (all of which handle euro and 5 of which handle dollars) and around 400 indirect participants, most of which are banks and building societies. Under the supervision of the Financial Conduct Authority (FCA), in 2015 the UK Payment Systems Regulator⁹ (PSR) created the Payment Strategy Forum (PSF) bringing together payment professionals, banks, consumer representatives and the government to discuss market-related issues and promote new initiatives. The latest discussions raised the need to review the UK’s payment architecture, focusing on the potential consolidation of the Bacs, FPS and C&CC operators.

⁹ The PSR has significant regulatory authority.

Box 6: Types of settlement used in instant payment systems

Two types of settlement are used in instant payment systems:

- **Deferred net settlement (DNS)** mechanisms are the same as that described above. In this type of settlement, transactions are transmitted, executed and notified in real time to the payment service providers (PSPs) concerned. The beneficiary’s PSP credits the funds to the beneficiary immediately. The positions are settled between the PSPs after the funds have been credited to the beneficiary’s account. The clearing system used for instant payments calculates the net positions of all the PSPs involved, which are subsequently settled in an RTGS system (usually in several daily settlement cycles).

Examples of instant payment systems using a DNS model include the following:

Korea	United Kingdom	China	India	Italy	Singapore
EBS	Faster Payments	IBPS	IMPS	Jiffy	FAST

- **Real-time settlement:** transactions are settled in high-speed sequences. Instructions are transmitted, executed and notified in real time to the PSP concerned, but, in contrast with the DNS model, funds are transferred between PSPs before being credited to the beneficiary. Funds can be transferred on a gross basis (whereby transactions are settled one by one in real time) or a net basis (whereby the system triggers high-frequency settlement cycles to enable near real-time settlement). Funds are transferred between PSPs’ RTGS accounts.

Examples of instant payment systems using a real-time model include the following:

Sweden	Mexico
Bir/Swish	SPEI

TIPS (Target Instant Payment Settlement), the instant payment settlement service put in place by the Eurosystem at end-November 2018 (see Chapter 7, Section 6.2), is using a real-time settlement mechanism. Funds are transferred between dedicated cash accounts (DCA for deposit cash accounts) legally opened in TARGET2. Liquidity can be provided to these DCAs from participants’ TARGET2 accounts.

For details on risk management in instant payment systems, see Section 3.2 below.

3. Financial risks associated with retail payment systems

3.1. Deferred net settlement (DNS) mechanisms: liquidity risk and credit risk

Retail payment systems generally rely on deferred net settlement (DNS) mechanisms, whereas most large-value payment systems use gross settlement mechanisms.¹⁴ While DNS systems provide greater liquidity efficiency, they also carry greater settlement risk: as settlement is deferred, there is a risk that participants' net balances may not be paid if one or more participants default.

The concept of settlement risk encompasses both credit risk and liquidity risk. These two types of risk materialise in different ways in a DNS retail payment system (see Chapter 17):

- liquidity risk arises if a participant is unable to honour a payment when it falls due, but may potentially be able to pay at a later date. In DNS mechanisms that do not incorporate a settlement guarantee, the system or its participants are exposed to liquidity risk if one or more participants default on their payments. In such cases, if there is no guarantee mechanism, the transactions affected by the default(s) are partly or wholly cancelled. The net balances are then recalculated for settlement by the non-defaulting participants. Such cancellations can squeeze the liquidity of non-defaulting participants, creating the risk that further defaults could occur;
- credit risk arises when the defaulting participant cannot make their payment on the due date and is unlikely to be able to pay at a subsequent date. In such cases, the participant becomes insolvent and cannot take part in the transaction. This creates a risk of loss for the system or its participants relating to the exposures involved, if the clearing system for the payment instrument concerned¹⁵ provides for the immediate provision of funds (instant payments, cash withdrawals, etc.) or includes a settlement guarantee

(bank card transactions). These exposures can sometimes be outside the system.¹⁶

Liquidity risk and credit risk are not strictly independent of each other: liquidity risk always arises before credit risk. If a participant defaults, in the first instance this creates liquidity risk. Credit risk follows if the participant is permanently unable to fulfil its payment obligation.

3.2. Management of financial risk and existing protection mechanisms

At present, most retail payment systems in Europe operate without a risk coverage mechanism. In the Eurosystem, only systemically important payment systems (SIPS)¹⁷ are required to cover their risk. For SIPS or systems incorporating risk protection mechanisms, the level of protection provided can vary from coverage of the highest net debit balance shown by a system participant to a full guarantee ensuring that all transactions will settle.

The main models used to cover financial risk are risk pooling, individual guarantees and prefunding:

- risk pooling arrangements can take the form of a common guarantee fund constituted by direct participants covering net debit positions up to a cap set by the system's operator and/or participants. Such funds are generally set to protect the system against the failure of the direct participant holding the highest net debit position, an arrangement known as "Cover 1";
- in models based on individual guarantees, the operator can require a participant holding a net debit position in the system to provide or top up a liquidity deposit to guarantee the settlement of their net balances;
- with prefunding, financial institutions are required to deposit funds in their accounts at the settlement institution before these accounts can be used to settle their payment obligations.

¹⁴ Except for EURO1, which is a large-value payment system operating on a deferred net settlement basis. The vast majority of large-value payment systems operated by central banks for monetary policy-related operations and interbank payments are RTGS systems.

¹⁵ In retail payment systems, the automated processing of payment orders is generally structured by type of payment instrument.

¹⁶ For example, in the French retail payment system, CORE(FR), credit risk exposures, notably relating to payments and withdrawals by card, arise outside the system, at the level of the participants. The exposures depend on participants' practices for the crediting/debiting of customers' accounts, which takes place before the interbank settlement of the balances calculated in CORE(FR).

¹⁷ A payment system is qualified as "systemically important" if, in the absence of sufficient protection against risk, an internal disruption resulting, for example, from a participant's insolvency can have knock-on effects for other participants or systemic effects across the broader financial sphere. The key criterion that determines an institution's potential systemic importance is the size/type of its payment orders and their overall value. This justifies the requirement for the associated financial risks to be covered. For prominently important retail payment systems (PIRPS) and other retail payment systems (ORPS) the level of financial risk is lower. This is why the Eurosystem concluded that compliance with the fundamental principles for financial risk management need not be mandatory for these systems.

Box 7: Examples of protection mechanisms used in payment systems

System	Protection mechanism	Description
STEP2-T (and the other retail payment systems in the euro area, except for CORE(FR))	None	If a participant goes bankrupt, net balances are recalculated and the system attempts to settle them again among the non-defaulting participants.
CORE(FR)	A Common Guarantee Fund covering at least 80% of the highest net debit positions, supplemented with individual guarantees.	The financial security mechanism (FSM) comprises a Common Guarantee Fund (CGF) and individual guarantees (IGs). The CGF protects the system against a participant's default, provided that the participant's net debit position is under EUR 650.5 million. If the net debit position is higher than the CGF amount, IGs are called in after the cut-off to cover the default. If the calls for guarantee fail, the default is not covered. The defaulting participant is excluded from the clearing process and a "partial" clearing process is executed.
Bacs (UK) and euro area payment systems that process instant payments using the ASI6-RT procedure to settle them in the Eurosystem (TARGET2, ¹ see Chapter 7).	A "cover all" arrangement, whereby all positions are covered by full pre-funding.	Participants are required to post collateral at the start of the day (or, for instant payments (IP), when the system is launched). The amount of collateral posted (generally cash) determines the maximum debit cap. Payments not covered are queued (or rejected in the case of IP). Participants can increase their debit cap during the day by providing additional liquidity.

¹ The launch of IP in the euro area began with the RT1 system operated by EBA Clearing in November 2017.

Source: ECB, Banque de France, Bank of England.

Box 8: Risk management in instant payment systems

Liquidity risk and credit risk are covered differently depending on the type of settlement used by the system concerned.

- **Deferred net settlement:** participants' commitments can be covered by a prefunding arrangement (see above), whereby participants must deposit funds in their accounts at the settlement institution to set their maximum authorised payment capacity in the system.

This type of protection mechanism is used notably for European instant payment systems such as RT1 operated by EBA Clearing. The system interacts with TARGET2 via a specific procedure (ASI6 Real Time), so that collateral can be constituted in central bank money on a technical account opened in TARGET2 before transactions are processed in the system. Each participant can allocate liquidity to this account from their TARGET2 account. The amount allocated determines the participant's maximum payment capacity for instant payments. If this maximum capacity is reached, the participant must deposit additional funds in their prefunding account. If they fail to do so, the participant will no longer be able to settle payment instructions on their account.

- **Real-time settlement,** transactions need not be covered by collateral or prefunding amounts because payments are settled on a gross basis in real time: funds are first transferred between participants' RTGS accounts. If a participant has insufficient funds in their account to settle a payment order, the order is rejected. The beneficiary's account is credited only after funds have effectively been transferred in central bank money between the originator's PSP and the beneficiary's PSP. This type of system prevents the accumulation of a net debit position that can pose a financial risk in a deferred settlement system.

4. The Eurosystem's oversight framework for retail payment systems

4.1. Reasons for the oversight of retail payment systems

The oversight of payment systems is one of the major roles assumed by a central bank, as these systems are essential for the smooth functioning of the capital markets and the economy (see Chapter 18). Retail payment systems remain crucial for the functioning of most economic activities, being widely used for payment transactions between economic agents, individuals, companies and public administrations. Effective oversight promotes safe, efficient systems that facilitate the circulation of money and sustain confidence in the economy.

In their oversight capacity, central banks pay close attention to the financial and operational risks associated with retail payment systems. The deferred net settlement processes generally used by retail payment systems create liquidity risk and credit risk, which must be monitored and mitigated by the system's operator and/or participants. While advances in information technology have enabled operators to process increasingly large volumes of transactions with ever diminishing unit costs, they also require systems to have greater operational resilience. If an operating incident is not resolved speedily, it can prevent a great many transactions from being processed. In view of this, operational risk management and a system's ability to resume normal operations swiftly after an incident are crucial.

In the Eurosystem, the oversight of payment systems is arranged in accordance with the subsidiarity principle. As a rule, operators of euro area payment systems are overseen by the national central bank of the jurisdiction in which their system operates (the national anchor). For systems operating in several jurisdictions, however,

oversight responsibility falls to the authority of the country in which the operator is domiciled. In addition, by a decision of the Council of Governors of the ECB, the Eurosystem can assign oversight of a pan-European payment system directly to the ECB. Therefore, under the national laws of European countries, most payment systems (including those which process retail transactions) are overseen by their national central banks. One exception is the STEP2-T system (operated by EBA Clearing, domiciled in France), which, in view of its pan-European dimension, is overseen by the ECB.

As means of payment become increasingly integrated, there is a growing trend towards cross-border transactions in the euro area and the Eurosystem must adapt its oversight framework accordingly. Although its oversight is decentralised, by implementing this harmonised framework it ensures that common requirements are enforced consistently across the euro area.

4.2. Common principles

By a decision of 3 June 2013, the Council of Governors of the ECB adopted the "Principles for Financial Market Infrastructures" (PFMI, see Chapter 18) as the Eurosystem's oversight standards for all types of financial infrastructure operating in the euro area. The key features of the PFMI are geared towards strengthening requirements for the management of credit risk and liquidity risk, and recognising non-financial risks such as general business risk and the risk associated with tiered participation arrangements.

The PFMI apply to euro area payment systems in varying degrees, depending on the importance of the system concerned. In the Eurosystem's oversight framework, payment systems are categorised according to three levels of importance: SIPS, PIRPS and ORPS. In practice, all the PIRPS and ORPS in the euro area are retail payment systems. There are four SIPS: two retail

Box 9: Principles applicable in the euro area, based on the payment system's importance

Principles	SIPS	PIRPS	ORPS
Total number of applicable principles	18	12	9
Principle 1: Legal basis	X	X	X
Principle 2: Governance	X	X	X
Principle 3: Framework for the comprehensive management of risks	X	X	X
Principle 4: Credit risk	X		
Principle 5: Collateral	X		
Principle 6: Margin			
Principle 7: Liquidity risk	X		
Principle 8: Settlement finality	X	X	X
Principle 9: Money settlements	X	X	
Principle 10: Physical deliveries			
Principle 11: Central securities depositories			
Principle 12: Exchange-of-value settlement systems	X		
Principle 13: Participant-default rules and procedures	X	X	X
Principle 14: Segregation and portability			
Principle 15: General business risk	X	X	
Principle 16: Custody and investment risks	X		
Principle 17: Operational risk	X	X	X
Principle 18: Access and participation requirements	X	X	X
Principle 19: Tiered participation arrangements	X		
Principle 20: FMI links			
Principle 21: Efficiency and effectiveness	X	X	X
Principle 22: Communication procedures and standards	X	X	
Principle 23: Disclosure of rules, key procedures and market data	X	X	X
Principle 24: Disclosure of market data by trade repositories			

Source: ECB.

payment systems – STEP2-T and CORE(FR) – together with TARGET2 and EURO1.

This classification is based on four criteria: (i) the volume and value of transactions processed by the system, (ii) the system's share of the national and European market, (iii) the amount of cross-border traffic and (iv) use of the system to settle other systems' transactions, where appropriate. On this basis, the Eurosystem adapted its requirements to the importance of each system. As a result, SIPS must comply with all the principles set out

in the PFMI and transposed in the SIPS Regulation, while PIRPS and ORPS need only comply with a sub-set of principles (12 of the 18 principles applicable to payment systems for PIRPS and 9 of the 18 principles for ORPS).

For SIPS, the Eurosystem transposed all the PFMI in ECB regulation 795/2014, which came into force on 12 August 2014 and was revised on 16 November 2017. This regulation makes compliance with the PFMI requirements mandatory and gives the overseer powers of enforcement

over the operator. The ECB therefore has the power to sanction payment system operators that breach the regulation's requirements (see Chapter 18).

4.2.1. Cooperation between Eurosystem central banks in their oversight of payment systems

To improve the implementation of the principles and ensure that all systems are treated equally, the Eurosystem took measures to ensure cooperation between the national oversight authorities. In practice, assessment schedules are aligned and assessments follow a common methodology, which was revised in June 2018¹⁸ in line with the revised regulation on SIPS. The assessment reports prepared by the national overseers are based on a common framework and are subject to peer reviews. Issues that could potentially be interpreted differently by the various oversight bodies are discussed at the level of the Eurosystem to achieve a common interpretation. Given the particular importance of SIPS, the Eurosystem receives regular reports on their activities

(changes, incidents, assessment and monitoring of action plans, etc.) from the national oversight authority.

4.2.2. The role of the Banque de France and measures it has taken

Pursuant to the provisions of the French Monetary and Financial Code,¹⁹ the Banque de France ensures the oversight of payment systems in the Eurosystem's framework. In particular, the Banque de France is responsible for overseeing the French retail payment systems CORE(FR) and, more recently, SEPA.EU. Being qualified as a SIPS, the CORE(FR) system must regularly report on its activities to the Eurosystem's authorities.

As the company STET operates the French payment system and provides critical services to the Belgian retail payment system (CEC), with the two user communities sharing the same technical platform, the Banque de France and the Banque Nationale de Belgique have signed an agreement to facilitate information exchanges and the coordinated implementation of oversight requirements.

18 <https://www.ecb.europa.eu/pub/pdf>

19 Article L.141-4.