

# CHAPTER 14

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## TARGET2-Securities (T2S)

Updated on 17 December 2018

**T**2S, the technical settlement platform developed and operated by the Eurosystem, is an essential contribution to the integration process of European financial markets. This initiative of the Eurosystem, launched in 2008 and gradually rolled out between June 2015 and September 2017, has already made it possible to harmonize many settlement characteristics (within the euro area and in the non-euro markets that have decided to join T2S) and provides a solution to the disadvantages of the fragmentation of European markets with respect to the settlement of securities. It has developed alongside European regulatory initiatives (such as the European CSDR) and political initiatives (the Capital Markets Union – CMU project launched by the European Commission in 2015), the latter having benefited from the role of T2S as a catalyst for the harmonisation of financial markets in Europe.

By the end of 2018, 23 European CSDs had migrated to T2S, including some CSDs established outside the euro area. This high level of participation demonstrates the expected benefits of T2S in terms of settlement efficiency and harmonisation. As mentioned in Chapters 12 and 13, T2S is not, within the meaning of CSDR, viewed as a securities settlement system<sup>1</sup> – where the latter is defined as the settlement function of a CSD – but as a technical platform to which CSDs that have decided to participate in T2S outsource their settlement operations.

In 2001, at the instigation of the ECB, the CESR<sup>2</sup> and the European Commission, a group of financial sector experts was set up to study the European securities settlement market, which appeared to be highly fragmented. This group published two reports, in November 2001 and then in April 2003, commonly referred to as the “Giovannini Reports” (named after the group’s president, Alberto Giovannini). These reports highlighted various obstacles (or “barriers”) to a smooth flow of securities between European countries, attributable in particular to tax rules, legal aspects, management procedures for corporate

actions,<sup>3</sup> technical or organisational aspects, etc. (see table in Section 7 of this chapter).

These “barriers” were compounded by the high number of infrastructures. Organised by domestic market and fragmented, the European settlement landscape in general, and in the euro area in particular, lacked harmonisation, which entailed significant costs for all non-domestic market participants, even European ones, whether they were financial service providers or investors. Despite the existence of a single currency, these costs were such that they hindered the development of cross-border securities circulation within the European Union and especially in the euro area. This is the problem that T2S has solved.

## 1. The driving role of the Eurosystem and the governance of T2S

### 1.1. The principles underlying T2S

While some groups, such as Euroclear with its ESES system, had previously implemented internal projects for the development of single settlement systems (see Box xx), it was difficult to expect the European CSDs to agree on a common infrastructure, due to differences of interest between groups as well as the coexistence of competing and technically different models. As we mentioned in Chapter 13, the French system (RGV, which became ESES France) was based on the so-called “integrated” model in which the cash and securities accounts are managed on the same platform (the technical management of cash accounts in central bank money being delegated by the central bank to the CSD); while the German system was based on the so-called “interfaced” model, in which cash accounts and securities accounts are managed on two separate platforms.

The Eurosystem therefore took determined measures to create a common settlement platform, to contribute to the objective of a better integration of European markets.

1 A securities settlement system makes it possible to hold and transfer securities free of payment or versus payment (see Chapter 13).

2 The Committee of European Securities Regulators (CESR), was an independent European committee bringing together the European regulators of financial markets. Created in 2001 by the European Commission, it was replaced on 1 January 2011 by the European Securities and Markets Authority (ESMA).

3 The term “corporate actions” refers to all events that may occur during the life of a security. Some occur on a fixed date (coupon payments, redemptions), others are exceptional (stock splits, public tender offers, etc.) and are usually more complex. Through one of its permanent working groups, the Corporate Actions Sub-group, T2S has contributed significantly to the harmonisation of “transaction management”, i.e. the management of corporate actions such as market claims and transformations.

### Box 1: General principles of TARGET2-Securities

**Principle 1:** The Eurosystem shall take on the responsibility of developing and operating T2S by assuming full ownership.

**Principle 3:** T2S shall not involve the setting-up and operation of a CSD, but instead will serve only as a technical platform for providing settlement services to CSDs.

**Principle 5:** The T2S settlement service will allow CSDs to offer their participants at least the same level of settlement functionality and coverage of assets in a harmonised way.

**Principle 7:** T2S shall require participating CSDs to be designated under the Settlement Finality Directive (SFD) in their respective jurisdiction.

**Principle 9:** The primary focus of T2S shall be settlement services in euro.

**Principle 11:** T2S shall allow users to have direct connectivity to its platform.

**Principle 13:** All CSDs settling in euro central bank money shall be eligible to participate in T2S.

**Principle 15:** All CSDs connecting to T2S shall do so under a harmonised contractual arrangement.

**Principle 17:** T2S settlement rules and procedures shall be common to all participating CSDs.

**Principle 19:** T2S services shall be compatible with the principles of the European Code of Conduct for Clearing and Settlement.

**Principle 2:** T2S shall be based on the TARGET2 platform and will hence provide the same levels of availability, resilience, recovery time and security as TARGET2.

**Principle 4:** The respective CSD users' securities accounts shall remain legally attributed to each CSD.

**Principle 6:** Securities account balances shall only be changed in T2S.

**Principle 8:** T2S shall settle exclusively in central bank money.

**Principle 10:** T2S shall be technically capable of settling currencies other than the euro.

**Principle 12:** CSDs' participation in T2S shall not be mandatory.

**Principle 14:** All CSDs connecting to T2S shall have equal access conditions.

**Principle 16:** All CSDs connecting to T2S shall have a single calendar of opening days and harmonised opening and closing times for settlement business.

**Principle 18:** T2S shall operate on a full cost-recovery and not-for-profit basis.

**Principle 20:** T2S shall support the participating CSDs in complying with oversight, regulatory and supervisory requirements.

Source: ECB.

At the end of a market consultation phase, followed by a user requirements definition phase, which took place successively between 2006 and 2008, the ECB's Governing Council decided in July 2008 that the Eurosystem would set up a technical

settlement platform, entrusting the IT developments and the technical operation of the platform to four national central banks (Deutsche Bundesbank, Banco de España, Banque de France and Banca d'Italia, the so-called "4CB").

The implementation of T2S is based on twenty principles (General principles of TARGET2-Securities: see Box 1) which were approved by the ECB's Governing Council and form the basis of the T2S architecture and the distribution of various players' roles. These principles stress that the Eurosystem is not intended to replace the CSDs (see Principle 3), but to offer them a unified technical settlement solution (the other two core services of CSDs, the notary function and central account maintenance service, are not outsourced to T2S, nor their so-called ancillary services. These functions are defined in Chapter 12). Moreover, participation in T2S is not mandatory, membership is up to each CSD.

One of the key features of T2S is that it operates in "central bank money": settlement of the cash leg of transactions processed by participating CSDs is done in the books of a central bank.

## 1.2. The governance of T2S

The governance of T2S is conducted by stakeholders directly involved in the platform:

- The European Central Bank (ECB), as project manager and operator of T2S;
- The national CSDs, as managers of the securities accounts, designated as "participants" in T2S;
- The National Central Banks (NCBs) as the cash account managers, also designated as "participants" in T2S.

Beyond these direct stakeholders, the "users" of T2S – i.e. participants in CSDs, mainly banks and investment firms – are also involved in the governance of T2S. It is indeed these market players, in particular the custodians, who are best able to assess the extent to which T2S meets the expectations of issuers and investors, and their own expectations in terms of more fluid access to the various European markets. They are represented at the level of each market in the national user groups (see below). However,

the participants in CSDs, although they are T2S "users", have no direct contractual relationship with T2S: they maintain commercial and contractual relations with the CSDs for their securities accounts and with the NCBs for their cash accounts.

The governance is based on an agreement between, on the one hand, the Eurosystem and the CSDs (the T2S Framework Agreement), and on the other hand, between the Eurosystem and the non-euro central banks that have made the decision to make their currency eligible for the settlement of transactions in T2S under the Currency Participation Agreement<sup>5</sup> (to which up to now only the Danish central bank is a party). The purpose of this governance structure is to ensure that all T2S stakeholders (the ECB, national central banks, CSDs and their users) are involved in the functional and strategic decisions relating to T2S. Lastly, the T2S platform is owned by the Eurosystem.

The Governing Council is responsible for defining the strategic priorities of T2S and its oversight, due to the importance of the project for the Eurosystem and for European integration in general.

The operation of T2S is the responsibility of the Market Infrastructure Board<sup>6</sup> whose members are appointed by the Governing Council. The MIB develops proposals for the Governing Council on strategic issues related to T2S and manages relationships with all stakeholders. The MIB is made up of members of the Eurosystem, members of the non-euro NCBs participating in T2S, and independent experts (non-NCB).

The CSD Steering Group (CSG) comprises the CSDs (and is chaired by one of them) and is responsible for coordinating the CSDs participating in T2S with the Eurosystem. To improve this coordination, the CSG also includes, as observers, representatives of the MIB and CSD participants.

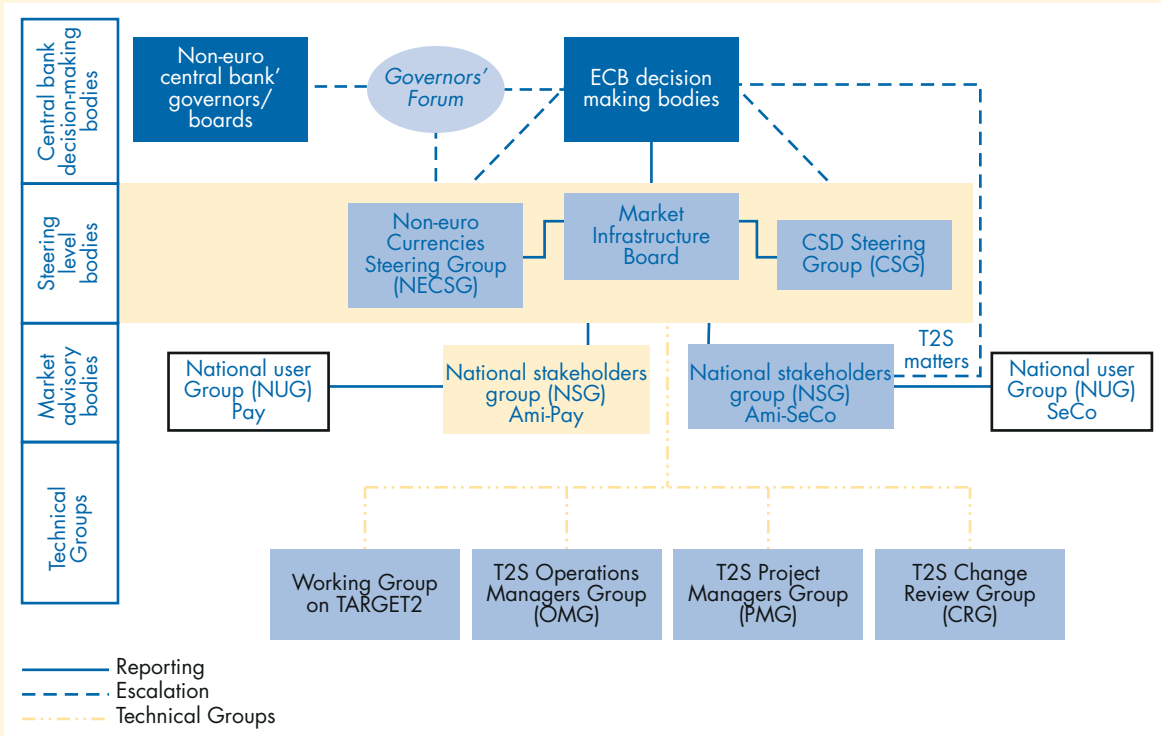
The Advisory Group on Market Infrastructures for Securities and Collateral (AMI-SeCo)

4 See Chapters 12 and 13.

5 Framework agreement setting out the responsibilities of the Eurosystem and the non-euro central banks participating in T2S. Management of the cash accounts of the non-euro central banks remains under their control.

6 The MIB is part of a broader strategic vision of the management of operations and development of the services of technical platforms such as TARGET2 and T2S, as well as new market infrastructure projects such as TARGET Instant Payment Settlement Service (TIPS) and the consolidation of T2 and T2S (RTGS services). For more details, see Chapter 7, Section 6.

### Box 2: The governance of T2S



Source: ECB.

advises the Eurosystem on T2S issues to ensure that T2S operations meet the needs of the market. The advisory group is therefore composed of about fifty representatives of all stakeholders (CSDs, the ECB and national central banks) and users (market infrastructures, banks), as well as observers (the European Commission and the ESMA in particular). In addition, and given the importance of harmonisation for the success of the T2S project, the AMI SeCo has from the outset set up a dedicated structure in charge of studying harmonisation issues and proposing standards: the “Harmonisation Steering Group” (see below).

The National Stakeholders Groups (NSG) are the links between the AMI-SeCo and the different national markets. They collect the opinion of T2S users in each national community regarding the developments

contemplated for T2S, as only a few participants from each national community are members of the AMI-SeCo.

Furthermore, technical groups made up of experts in ad hoc fields make it possible to address, among others, issues relating to the management of T2S developments and of operational procedures.

## 2. T2S operations

T2S is a platform for the settlement and delivery of securities in central bank money, whose primary settlement currency is the euro, while being multi-currency and thus offering the possibility of settlement in other currencies if a central bank outside the euro area wants to connect to T2S. This has been the case since October 2018, when

the Danish krone joined T2S. The platform has a distinctive operational organisation compared to the usual SSSs of CSDs, because it is integrated and international. This is because the location of the securities accounts of a number of CSDs and the cash accounts (in euros) of various NCBs within a single technical platform allows cross-border and national transactions to be processed using identical operational processes and at the same cost. Thus, in theory, the participating banks of the CSDs using T2S could use only one euro account and (possibly) only have one connection with a single CSD. This operational framework reflects the importance of the cross-border dimension of T2S.

**2.1. The “integrated model”**

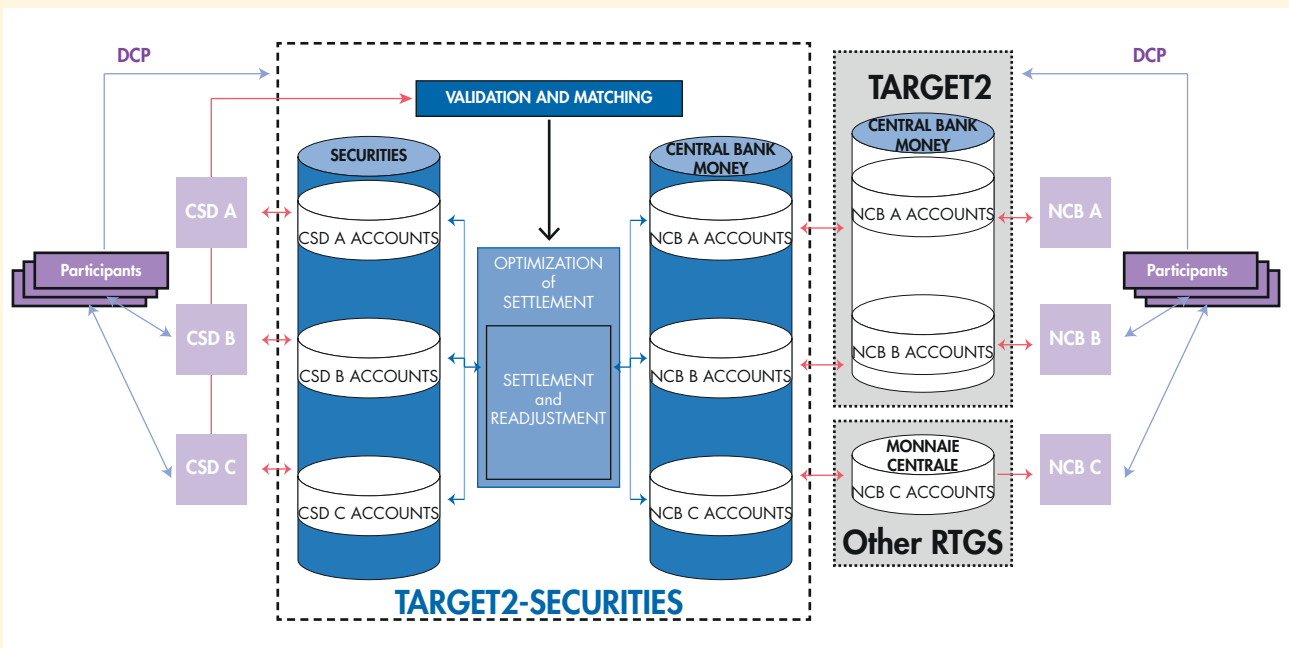
T2S operates an “integrated” model: the cash accounts dedicated to the settlement of transactions processed by T2S and the securities accounts are located on the same technical platform, which allows real-time

settlement (see Chapter 13 for more details). The CSDs outsource the delivery of the securities leg to the T2S platform while settlement of the cash leg is done through dedicated cash accounts (see Section 2.2 of this chapter) managed by the T2S platform. DVP settlement is therefore efficient, secure and fast. The organisation is similar to that implemented in Euroclear’s ESES system, where the management of cash accounts was outsourced by central banks to the CSDs. In contrast, in the T2S environment, it is the management of securities accounts that is outsourced by the CSDs to T2S.

**2.2. Settlement in central bank money: the dedicated cash accounts (DCAs)**

The dedicated cash accounts (DCAs) managed by the T2S platform interact with the cash accounts opened by the participants in the TARGET2 platform or in the RTGS systems managed by the non-euro area central banks. The DCAs can

**Box 3: Structure of securities and cash accounts in T2S**



Source: ECB.



be credited every day by the participants, either by automatic and recurring liquidity transfers (standing orders) or by one-off transfers (current orders). Residual liquidity in the dedicated cash accounts is automatically transferred by T2S at the end of the day to the cash accounts in TARGET2, before the change of accounting day. This same mechanism applies to the Danish krone and any other currencies (other than the euro) that might become eligible for settlement in T2S. For the record, the use of central bank money is one of the PFMI (see Chapter 17), and an essential prerequisite for financial stability, to which T2S contributes directly.

As part of the TARGET2 and T2S consolidation project (see Chapter 7, Section 6), operation of the DCAs will be improved. In particular, it will no longer be necessary to systematically transfer at the end of the day the cash remaining in the DCAs to the cash accounts in TARGET2.

### **2.3. The centralisation of liquidity**

To meet the flexibility needs of the various market players using T2S, and to adapt to the different markets, T2S offers several options for organising cash management. For example, thanks to the common settlement engine, T2S makes it possible to centralize liquidity within a single cash account and to use this cash account for all settlements within all CSDs using T2S, without introducing any difference in processing from one CSD to the next, or from one central bank to the next.

Similarly, the centralisation of securities with one CSD is possible, while using one or more cash accounts, even if these have been opened in several central banks. This centralisation under smooth operating conditions is nevertheless contingent upon the establishment of operational links between the CSDs. In addition, this type of centralisation remains more difficult to implement due to the incomplete harmonisation of European securities markets (see Section 7 of this chapter).

### **2.4. The settlement process**

The T2S settlement engine delivers real-time gross settlement with minimal liquidity requirements thanks mainly to sophisticated settlement algorithms. The algorithms can identify complex chains of transactions involving several counterparties that can be settled simultaneously, thus minimising the risk of bottlenecks, delays in settlement and settlement fails. T2S also handles “technical netting”, which is the calculation of net positions that allow a participant to buy securities using liquidity obtained from the sale of other securities. This type of optimisation is performed for all pending instructions. In some cases, it also relies on the sequencing of instructions to manage a waiting list of instructions eligible for settlement, based on the different priority levels of instructions. Lastly, it can apply full settlement if the securities and cash are in sufficient supply, or partial settlement if there is a partial lack of securities or cash, provided the two parties agree.

These T2S settlement modules are complemented by sophisticated settlement and consumed liquidity optimisation functions to achieve the greatest efficiency and security in settlement while not generating unbearable liquidity requirements for the participants.

### **2.5. The settlement and consumed liquidity optimisation functions**

T2S aims to achieve the highest level of settlement efficiency while minimising liquidity consumption, by reducing securities and cash settlement fails, better organising resources, and recycling instructions to increase the success rate of settlements. By mid-2018, the settlement rate was around 98%, both in terms of value and volume (all participating CSDs combined), which is in line with the objectives initially set for T2S in terms of settlement efficiency. The figure improved over the first months of actual use, and the Eurosystem, the CSDs and their participants are making sure that it is further improved, whether through technical changes or the adaptation of practices to the new tool.

#### Box 4: Operational research at the service of market infrastructures

In T2S, the two settlement processes, i.e. the daytime and night-time processes, do not work in the same way. In the daytime process, between 05:00 and 18:00, transactions are settled as they arrive in the system. During the night-time process, from 19:30 to 03:00, transactions are processed in batches. As a matter of fact, it is during this overnight process that most transactions are processed.

To process the batches of transactions presented at night, the design of the T2S settlement engine drew heavily from work inspired by operational research and resulted in the development of a real Mathematical Optimisation Module capable of selecting transactions that can be settled. The required securities and cash must of course be available for a transaction to settle and the transaction may be subject to complex functional rules such as auto-collateralisation or partial settlement. Lastly, the selection is carried out by optimising two criteria: the volume, i.e. the number of transactions settled, and the value, i.e. the sum of the amounts settled.

The handling of these complex functional rules is based on operational research techniques, which allows them to be taken into account to determine the largest set of valid transactions.

The transcription of the data generated by the functional rules in the form of equations leads to a number of equations and variables roughly equal to the number of transactions. Applied to T2S, the result is a system of several million equations for as many variables. The extremely high volume to be processed in a very short time (less than one hour) also increases the difficulty, as well as the fact that at the end of the processing, a “binary” result is expected (a transaction is either settled or rejected, no intermediate state is possible).

The system of equations thus obtained is then solved using dedicated mathematical software. The properties of the algorithm used guarantee overall optimisation of the process. In addition, during the optimisation process it is possible to know the gap between the current settlement and the “optimal” settlement. Lastly, the software is able to provide a valid intermediate solution in case of a sudden interruption or limited time.

The mathematical modelling used avoids the pitfalls and possible biases of a “conventional” algorithm, such as the one used for gross settlement (GROSS), which runs in accordance with a predefined order and for which all the interdependencies between the rules must be planned and covered during development. Lastly, maintenance is simplified: a change in a functional rule only imposes a change in the system and not a redesign of the entire process.

Once the modelling phase was completed, the results were quickly better than those obtained previously using “conventional” GROSS-type algorithms. This work was continued to perfect the first experiments. Several resolution methods were developed to ensure the relevance and quality of the results produced.

The effectiveness of settlement and the minimisation of liquidity needs are further enhanced by the use of other optimisation features: partial settlement and auto-collateralisation. T2S provides for the use of partial settlement during certain time windows throughout the day:<sup>7</sup> for example, if the quantity of securities is insufficient

at a time “t”, settlement will be made by T2S for the quantity of securities available, and the remaining amount will be settled at a later stage.

T2S also offers auto-collateralisation, inspired by the liquidity management techniques that prevailed in the French settlement systems.

<sup>7</sup> The number of partial settlement windows has been increased since the platform was rolled out in June 2015: there are now five of them, at 08:00, 10:00, 12:00, 14:00 and 14:15 for 15 minutes.



This mechanism allows banks holding a DCA, known as payment banks, to obtain liquidity from a central bank, in exchange for securities eligible for refinancing operations of the relevant national central bank (the national central bank of the Eurosystem or the central bank of Denmark, depending on the currency of settlement). This is “central bank auto-collateralisation”, which allows the automatic provision of liquidity by the granting of intraday credit by the NCB, guaranteed by eligible collateral. CSD participants in the T2S environment can thus benefit from liquidity during the day, which makes it easier to settle transactions and, as a result, to improve the settlement rate.

Auto-collateralisation relies on:

- securities already held by the buyer (“auto-collateralisation on stock”);
- or the securities that are being purchased (“auto-collateralisation on flow”).

This mechanism, which is essential for optimising liquidity, relies on the use of settlement in central bank money, as the latter is able to grant intraday credit to payment banks efficiently and securely.

This possibility of optimised management has been extended by the payment banks to their own clients. This so-called “client collateralisation” is made possible by the T2S functionalities.

## 2.6. The processing of a transaction by T2S

CSD participants have the option of using T2S either through their CSD, in which case it is an indirect connection to T2S, or directly, for those who have chosen the status of “directly connected participants” (DCP).

For participants connected indirectly to T2S, there is no change from the situation prior to T2S since they can continue to have a relationship only with their CSD, which redirects their transactions to T2S

for settlement. DCPs send their payment and securities transfer orders directly to T2S. DCPs are T2S users who have been certified by the Eurosystem and authorised by a CSD or an NCB to technically link directly to T2S to use its services, without having to resort to the technical interface of a CSD and/or an NCB. The link however is only technical: DCPs’ cash and securities accounts continue to be held by their central bank and their CSD, respectively.

If the instructions have not been matched by the T2S user CSD, T2S matches the instruction with the corresponding instruction received from the participant’s counterparty (purchase of securities against cash payment on one side; sale of the same securities and receipt of the same amount of cash on the other). When the settlement date is reached, the T2S platform ascertains that there are enough securities and funds available in the securities accounts and dedicated cash accounts in T2S for the transaction to be settled. If this is the case, T2S settles the transaction.

## 2.7. The operating day

A T2S operating day (D) begins on D-1 at 18:45. It ends at 18:45 on D. It includes the end and beginning phases of the day.

The end-of-day process, from 18:00 to 18:45, closes the settlement process for the day, allows the preparation of recycling (on the next settlement day) of instructions present in the system but not yet settled on the day that ended with the 18:00 “cut-off” and allows the flushing of some instructions, in particular those that could not be matched within 20 days following their entry into the system. The process also prepares the end-of-day reports and account statements. Once these preparations for the next day have been completed, the “start-of-day” process can begin. It runs from 18:45 to 20:00 and enables the change of date, the revalidation of pending settlement instructions, the updating of certain repository data and preparation of the night cycle.

**2.8. Cross-border settlements**

As stated previously, T2S makes cross-border settlement identical, in terms of costs, risk and technical process, to “domestic” settlement, since it centralises the securities accounts of several CSDs and the cash accounts (in euros) of several NCBs within a single technical platform. It greatly enhances the integration of securities settlement within the European Union. Before T2S, a participant was obliged to resort to several CSDs, themselves possibly linked to other CSDs, to access the different markets, or to go through an intermediary (custodian) that provided the access to each market. The diagram below illustrates this architecture.

In contrast, T2S is a hub at the heart of the euro settlement process,<sup>8</sup> to which the CSDs are linked, allowing cross-border settlement to be as effective as domestic settlement.

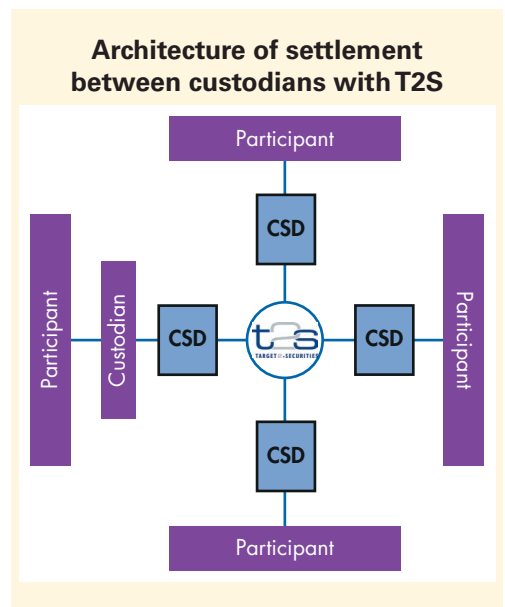
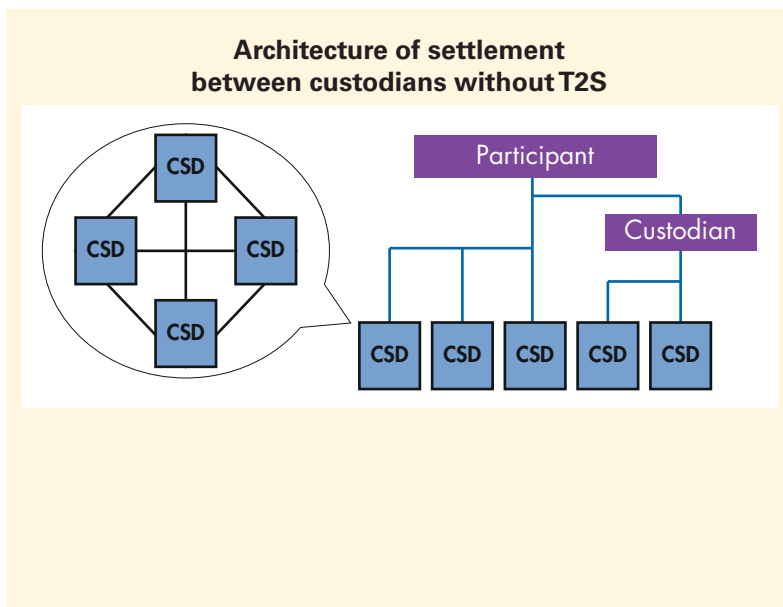
The cross-border movement of securities in T2S is essentially based on the establishment of links between the CSDs, which are technically implemented on the T2S platform (accounts opened by an investor CSD in the books of an issuer CSD

to reflect the assets of its participants for a given security). The establishment of links remains the sole responsibility of the CSDs, which must assess their relevance in terms of activity, and then set them up legally (see below and Chapter 12).

Indeed, one of the ways for investors established in a market to access securities issued in other markets is to use the links between its “domestic” CSD (“investor CSD”) and “issuer CSDs”. This possibility existed before T2S both in Europe and with CSDs from other continents, but these links were rarely used, almost exclusively for FoP exchanges<sup>9</sup> and with very few DvP exchanges in central bank money. T2S significantly facilitates the establishment of links between participating CSDs, including DvP links due to the technical and operational harmonisation it brings about between these CSDs. The establishment of links between CSDs participating in T2S is therefore expected to accelerate in the coming years. The T2S platform therefore allows, all else being equal, a better cross-border circulation of securities (including collateral) and contributes directly to the objective of mitigating the fragmentation of markets.

8 Or in any other currency for which the central bank of issue decides to join T2S.

9 Free of payment. See Chapter 13.



**Box 5: The links between CSDs**

A link between securities settlement systems is a set of technical and legal arrangements for the transfer of securities between systems. A direct link is an account opened by a CSD, called the investor CSD, in the books of another CSD, called the issuer CSD, to facilitate the transfer of securities between the participants of these CSDs. The links can also be relayed, i.e. involve an intermediate CSD.

The Eurosystem periodically assesses the links between CSDs to determine whether they can be used by its counterparties. As of 22 November 2018, there were 62 eligible direct links and 26 eligible relayed links.

Investor CSD	Issuer CSD	Belgium	Denmark	Germany	Greece	Spain	France	Italy	Lithuania	Luxembourg	Portugal	Malta	Netherlands	Austria	Slovenia	Slovakia	Finland	Number of direct links per investor CSD	Number of relayed links per investor CSD			
		Euroclear Bank NBB-SSS	VP Securities A/S Clearstream Banking AG (CBF)	CBF-CREATION CBF-system	BOGS Iberclear-ARCO	Euroclear France Monte Titoli	CSDL Clearstream Banking S.A.	LuxCSD Interbolsa	MaltaClear	Euroclear Nederland OeKB CSD GmbH	KDD CDCP	Euroclear Finland										
Belgium	Euroclear Bank	D	D															13	0			
	NBB-SSS																					
Denmark	VP Securities A/S																					
Germany	Clearstream Banking AG (CBF)																					
	CBF-CREATION	R	R		R	R	R	R		D	R		R	R	R	R	R	1	12			
	CBF-system	D	D			D	D	D		D	D	D	D			R		10	1			
Greece	BOGS				D													1	0			
Spain	Iberclear-ARCO				D		D	D					D	D				5	0			
France	Euroclear France	D	D		D	R	D		D					R				5	2			
Italy	Monte Titoli	D	D		D	D	D			D			D	D				9	0			
Lithuania	CSDL									D								1	0			
Luxembourg	Clearstream Banking S.A.	D	R	D		D	D		R	R		R	R	R	D	D	D	8	6			
	LuxCSD		R			D		R	R				R	R				1	5			
Portugal	Interbolsa							D					D					2	0			
Malta	MaltaClear					D												1	0			
Netherlands	Euroclear Nederland	D																1	0			
Austria	OeKB CSD GmbH				D		D	D					D					4	0			
Slovenia	KDD																					
Slovakia	CDCP																	62	26			
Finland	Euroclear Finland																					
<b>Number of direct links per issuer CSD</b>		4	4	3	0	0	9	3	3	6	5	0	5	3	0	1	6	4	2	2	2	62
<b>Number of relayed links per issuer CSD</b>		0	3	1	0	0	1	2	0	3	3	0	0	1	3	4	1	1	1	2	26	

Source: ECB (<https://www.ecb.europa.eu/paym/coll/coll/ssslinks/html/index.en.html>), Banque de France.

However, at this stage, not all CSDs offer the CSD investor function (by setting up links with other CSDs) because this function involves providing participants of such an investor CSD not only with settlement services, which T2S facilitates greatly, but also all the asset servicing (everything that pertains to the life of the securities held, such as the processing of corporate actions, management of the taxation of securities, etc.) that accompanies access to securities issued via another CSD, which is much more complex and expensive.

### 2.9. Settlement finality in T2S

The Settlement Finality Directive (SFD) organizes the protection of instructions entered into a notified system in the event of the default (opening of administration or insolvency proceedings) of a participant (for more details on the SFD, refer to Chapter 5, Section 3.3). All T2S stakeholders, CSDs and central banks have agreed on common rules in this field:

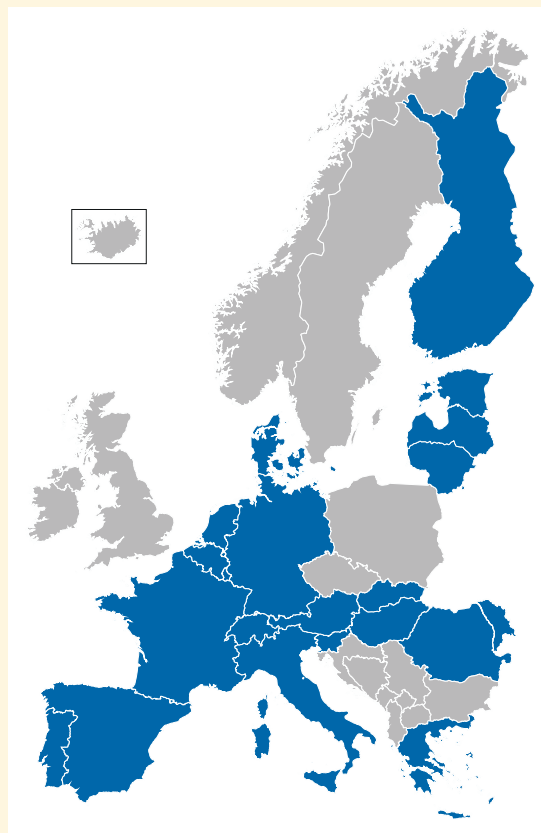
- an instruction is deemed to have been entered in the system ("SF1" moment) when it is validated in T2S;
- an instruction becomes irrevocable ("SF2" moment) when it is matched in T2S: it can no longer be modified or deleted by either counterparty alone but can be changed if both parties agree;
- T2S then settles it ("SF3" moment) (see Chapter 13, note 4).

These common rules provide increased legal certainty, especially for cross-border transactions. Each CSD adapts its contractual documentation accordingly at the time of its migration to T2S.

### 3. CSDs and central banks that have decided to participate in T2S

Together with the central banks of the Eurosystem and Denmark's Nationalbank (the Central Bank of Denmark), 21 European

#### Box 6: Countries in which a CSD participates or has committed to participate in T2S



Germany: Clearstream Banking A.G.; Austria: Oesterreichische Kontrollbank Aktiengesellschaft; Belgium: Euroclear Belgium ESES and National Bank of Belgium Securities Settlement System (NBB-SSS) – (titres d'Etat); Denmark: VP Securities A/S; Spain: Iberclear - BME Group; Estonia: Eesti Väärtpaperikeskus; Finland: Euroclear Finland Oy; France: Euroclear France ESES; Greece: Bank of Greece Securities Settlement System (BOGS); Hungary: Központi Elszámolóház és Értéktár Zrt. – KELLER; Italy: Monte Titoli S.p.A.; Latvia: Latvijas Centralais depozitārijs; Lithuania: Lietuvos centrinis vertybinių popierių depozitoriumas; Luxembourg: LuxCSD SA; Luxembourg: VP Lux Sàrl; Malta: Malta Stock Exchange; Netherlands: Euroclear Netherland ESES; Portugal: Interbolsa – Sociedade Gestora de Sistemas de Liquidação e de Sistemas Centralizados de Valores Mobiliários, S.A.; Romania: Depozitarul Central S.A.; Slovakia: Centrálny depozitár cenných papierov SR, a.s.; Slovenia: KDD – Centralna klirinško depotna družba, d.d.; Switzerland: SIX SIS Ltd/VP LUX S.à.r.l.

Source: ECB.

<https://www.ecb.europa.eu/paym/t2s/stakeholders/csd/html/index.en.html>

national CSDs committed to using T2S from its launch. In July 2012 they signed the T2S Framework Agreement outlining the responsibilities of the Eurosystem and the CSDs participating in T2S and the fact that each CSD remains responsible, in accordance with the laws of its own jurisdiction, for the management in T2S of the securities accounts of its clients. The balances of these

securities accounts are recorded in T2S, and accessible to CSDs and their users in real time, to be entered into their own systems.

The French CSD Euroclear France migrated to T2S in September 2016, together with the CSDs of the Netherlands and Belgium (belonging to the Euroclear group), which shared the same ESES settlement platform.

Some euro area CSDs do not use the T2S services, for various reasons. Examples include the Euroclear Bank and Clearstream Banking Luxembourg ICSDs that are operating a commercial bank money settlement system (see Chapter 12). As for the German Clearstream Banking Frankfurt CSD, it only migrated its central bank money system (CBF-System) in February 2017, the commercial bank money system (CBF-Creation) remaining outside T2S.

In contrast, several CSDs established in countries outside the euro area have chosen to participate in T2S. This is the case, for example, of the Swiss, Hungarian and Romanian CSDs, which migrated the settlement of their transactions in euro but not for their transactions in national currencies at this stage. T2S was designed from the outset as a multi-currency platform, which allows it to process Danish krone transactions since October 2018, in addition to the euro transactions that have been processed since the launch of the platform; other currencies could follow in the medium term.

“Tailored” participations or adapted securities ownership schemes may be provided for in a few special cases such as the Polish market, which has not yet migrated to the euro<sup>10</sup> or the Irish market.<sup>11</sup>

#### 4. The gradual go-live of T2S

To allow a gradual ramp up of T2S, the migration of the CSDs to T2S took place in five successive waves between June 2015 and September 2017.

Beyond these initial five waves of migration, the CSDs wishing to join T2S later will be able to do so after a phase of technical tests conducted in cooperation with the Eurosystem and their participants, as was the case with the other CSDs.

The fourth wave of migration in February 2017 led to a sharp increase in daily average volumes settled by T2S (see Chart 1). These figures remained stable at this high level in the months that followed, peaking in December 2017 at an average of 571,879 transactions per day.

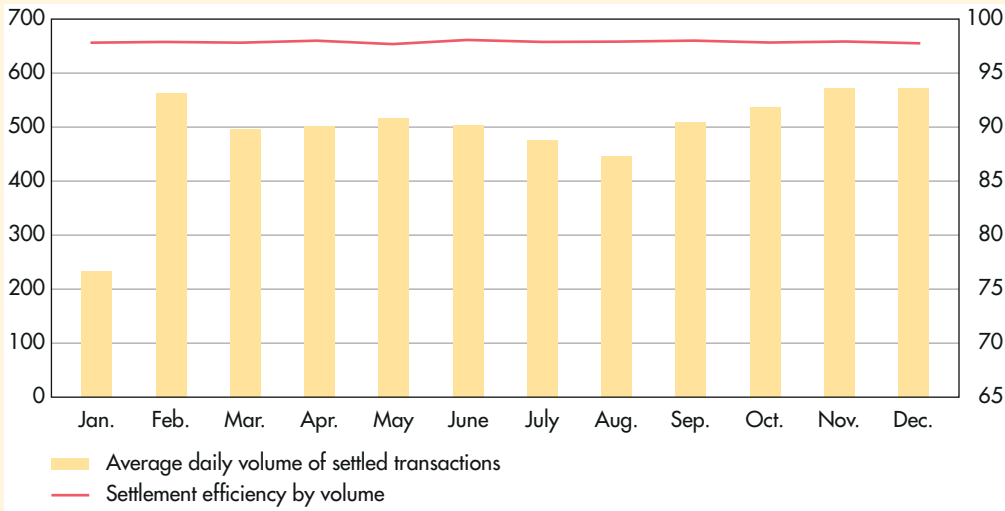
The daily average value of settled transactions increased in the same proportions, with a peak in December at EUR 884,4 billion per day (see Chart 2). Settlement efficiency has remained stable at a level exceeding 97%.

<sup>10</sup> Since the national CSD had not migrated to T2S, the Polish central bank (NBP) has not planned to migrate to T2S for the management of its cash accounts. However, some market participants in the Polish market have asked the NBP to open cash accounts in euros for T2S settlements. Insofar as the Polish CSD has not joined T2S, the aforementioned cash accounts will be linked to the securities accounts opened in the books of the Austrian CSD.

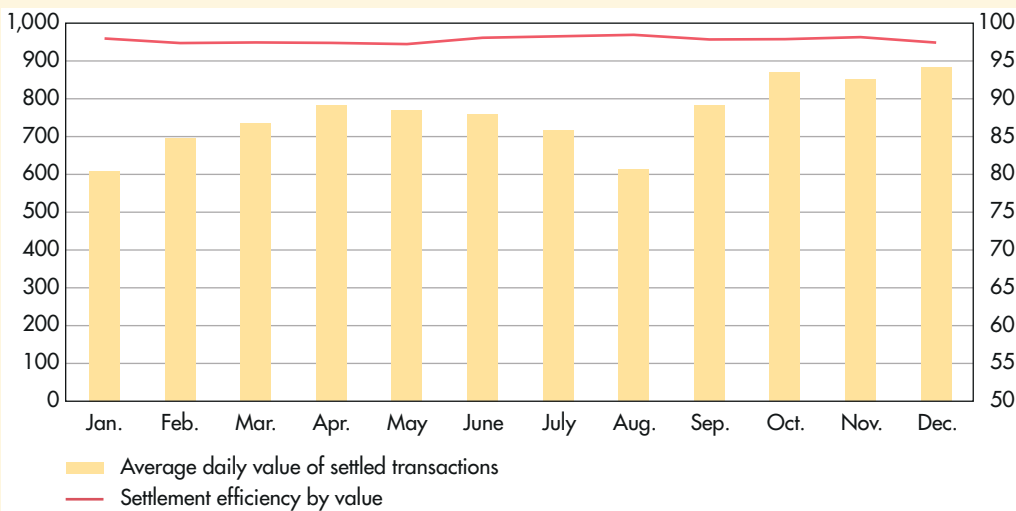
<sup>11</sup> Ireland is the only European country that does not yet have a domestic CSD, as Irish securities use the CREST platform of the Euroclear UK & Ireland CSD. As the Irish and UK markets have decided not to migrate to T2S, the Irish market has requested that Irish securities be admitted to T2S via the CSDs of the ESES platform, as an investor CSD. In a post-Brexit context, Ireland's central bank is looking into the various options available.

Wave 1 22 June 2015 - 31 August 2015	Wave 2 29 March 2016	Wave 3 12 September 2016	Wave 4 6 February 2017	Final wave 18 September 2017
Bank of Greece Securities Settlement System (BOGS) Depozitarul Central (Romania) Malta Stock Exchange Monte Titoli (Italy) SIX SIS (Switzerland)	Interbolsa (Portugal) National Bank of Belgium Securities Settlement Systems (NBB-SSS)	Euroclear Belgium Euroclear France Euroclear Nederland VP Lux (Luxembourg) VP Securities (Denmark)	Centrálny depozitár cenných papierov SR (CDCP) (Slovakia) Clearstream Banking (Germany) KDD – Centralna klirinško depotna družba (Slovenia) KELER (Hungary) LuxCSD (Luxembourg) OeKB CSD (Austria)	Nasdaq CSD (grouping the Baltic CSDs) Iberclear (Spain)

**Chart 1: Average daily volume of settled transactions and settlement efficiency by volume (2017)**



**Chart 2: Average daily value of settled transactions and settlement efficiency by value (2017)**

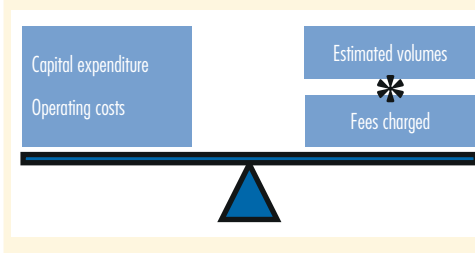


Source: ECB - <http://www.ecb.europa.eu/paym/t2s/about/multimedia/html/t2s2017.en.html>

## 5. The financing of T2S

The Eurosystem, which financed the construction of the T2S platform, intends to recover the full costs. Cost recovery will be achieved when the revenue received since the launch of the platform, and resulting from its use by participants (CSDs, central banks, credit institutions with securities accounts and cash accounts), covers the development and operating costs.

### The principle of T2S cost recovery



Source: ECB.



The following principles were followed for invoicing:

- the objective is not to generate profits, but full cost recovery based on estimated volumes;
- simple and transparent fee policy;
- equal fees for all national CSDs;
- no volume-based discounts;
- stability of the fee schedule: on the basis of settlement volume projections made at this time, the fee schedule was decided in 2010 by the Governing Council, which set a single price of 15 euro cents for the settlement of an instruction for the period from the go live of T2S until December 2018. A revised fee schedule was applied as of 1 January 2019, with a new price of 19.5 euro cents per transaction.

## 6. T2S oversight

Although T2S is not formally regarded as a securities settlement system, the systemic nature of T2S as a technical settlement platform has led the Eurosystem to apply to it an oversight mechanism similar to that of securities settlement systems (see Chapter 13).

T2S oversight is thus carried out jointly by the national central banks and the financial market authorities of the various jurisdictions in which at least one CSD has contractually committed to outsource its settlement service to T2S, with the ECB and ESMA co-chairing this cooperative body of the oversight group. The 21 CSDs that have migrated to T2S are established in 21 Member States of the European Union and the European Economic Area: the oversight group therefore brings together the competent authorities of these 21 Member States in addition to the ESMA and the ECB.

A preliminary assessment of T2S against ESCB-CESR standards<sup>12</sup> was finalised in early 2014 and then published by the ECB and ESMA. The assessment of certain standards had remained open, in particular that of settlement finality, pending common, finalised and legally enforceable rules. This was done with the coming into force in March 2018 of the “Collective Agreement” between all the central banks and the CSDs participating in T2S, which harmonised the three finality moments among all of them. Since then, the oversight of the “funds” part of T2S has been a part of the overall assessment of TARGET2,<sup>13</sup> because the cash accounts are legally opened in the national systems that make up T2 (e.g. TARGET2-Banque de France), and are carried out in accordance with the Principles for Financial Market Infrastructures – PFMI (see Chapter 18).

Apart from the “funds” part of T2S, it is also assessed against the PFMI. The T2S operator initially provides a self-assessment by answering a questionnaire; the final evaluation is conducted on the basis of this self-assessment, which is analysed critically by comparing it in particular with all the T2S documentation (contractual items, operating manuals, etc.). The substance of a number of topics are assessed for the first time, including the finality of T2S settlement thanks to the signing of an agreement in principle by all the CSDs and central banks participating in T2S and the actual transposition of these principles into common procedures, as well as the delivery of new functionality in T2S.

## 7. Concrete examples of harmonisation by T2S and other market unification drivers, T2S benefits

### 7.1. The harmonisation imposed by T2S and the associated governance

For T2S, the main objective of harmonisation has been to exclude national specificities from its operational functioning. This is why,

<sup>12</sup> The ESCB-CESR standards were non-binding standards adopted by European regulators for the oversight of CSDs and SSSs mainly. They have been replaced – with respect to the CSDs and SSSs – by CSDR since its entry into force.

<sup>13</sup> The report of the assessment of T2 against the PFMI is here: [http://www.ecb.europa.eu/pub/pdf/other/t2\\_disclosurereport\\_201606\\_en.pdf?8341c2a74d87b322292738afa9c331a3](http://www.ecb.europa.eu/pub/pdf/other/t2_disclosurereport_201606_en.pdf?8341c2a74d87b322292738afa9c331a3)

as part of the governance of T2S, actions have been implemented to promote the creation of a single body of rules for post-trade processes in the T2S community and thus contribute to financial integration in Europe. Specifically, harmonisation was first advanced for the functions whose harmonisation was necessary to avoid replicating national specificities for the operational blueprint of the T2S system (which would have been an impossible task). T2S has thus already largely contributed to the harmonisation of post-trade processes in Europe by specifying certain functionalities, such as the standardised use of certain fields for matching, so that the various market participants can access all T2S markets in a harmonised manner. In the same way, T2S has imposed a single communication standard, namely the ISO 20022 messages. Thus, by simply migrating to T2S, a large number of markets have automatically adopted some standards of the T2S environment, such as:

- ISO 20022 messages;
- matching fields;
- operating day and calendar;
- definition of the three finality “moments”: the moment the settlement instruction enters T2S, the moment this instruction becomes irrevocable (can no longer be changed by either party without the agreement of the other), and the moment the settlement is made.

This harmonisation was based on the work of the different T2S governance groups aimed at unifying market practices, as well as the legal and regulatory framework necessary for the smooth running of T2S. The T2S Advisory Group and subsequently the AMI-SeCo in particular mandated the T2S Harmonisation Steering Group (HSG) to promote post-trade harmonisation, monitor the dissemination of standards in the T2S markets and identify implementation difficulties, so as to encourage good market practices.

The T2S markets are thus regularly assessed by the HSG for the compliance of their technical, regulatory and market activities with the 17 harmonisation standards identified in a first report,<sup>14</sup> in July 2011. Two broad categories of standards had been identified: on the one hand, the so-called “priority 1” standards, viewed as necessary for the proper functioning of T2S and thus viewed as prerequisites for the operational launch of the system, on the other hand the so-called “priority 2” standards representing longer term harmonisation objectives<sup>15</sup> and therefore not viewed as prerequisites for the launch of T2S. However, the definition and the supervision of implementation of these standards started concurrently. Priority 1 standards, the implementation of which is not yet finished, continue to be monitored by the HSG. The implementation of priority 2 standards, some of which are much more complex, should eventually allow market participants to reap the full benefits of the T2S technical platform.<sup>16</sup>

The HSG produces an annual progress report on T2S harmonisation that portrays the compliance status of each market. The ninth progress report, released in October 2018,<sup>17</sup> shows that the different national markets connected to T2S have improved their overall compliance over the past four years. However, it also shows that the harmonisation of certain areas remains difficult, as evidenced by the example of the standards on corporate actions,<sup>18</sup> due to national differences in corporate actions management and processes.

Corporate actions management falls outside the scope of T2S, but T2S offers CSDs functionality for effective corporate actions management. Although T2S has flexible tools that can be adapted to the different corporate actions management models, there is a need for harmonisation in this area. This is most evident for cross-border transactions, where securities are held in several CSDs and transactions take place between several CSDs.

14 <https://www.ecb.europa.eu/paym/t2s/progress/pdf/ag/mtg14/item-8-2-1st-t2s-harmonisation-progress-report-to-ag.pdf?b5560efb011fd29c6271bdfc3cbeb8f6>

15 Legal harmonisation, standards for corporate actions, place of issue, tax procedures, transparency of registered shareholders, access to the market, portfolio transfer.

16 A reform of the oversight of harmonisation is being discussed with the main stakeholders (markets, CSDs, etc.).

17 <https://publications.europa.eu/en/publication-detail/-/publication/03506518-d800-11e8-90c0-01aa75ed71a1>

18 For example, dividend payments, redemptions of securities, stock splits, etc.

To this end, the HSG has created the Corporate Actions Subgroup (CASG) made up of experts from CSDs, CCPs and participants. This group is dedicated to the definition and analysis of standards relating to corporate actions, and the oversight of T2S markets for the implementation of standard rules for corporate actions processes. The CASG also produces an annual compliance analysis report of each market regarding corporate actions standards in T2S.

## **7.2. Harmonisation work still remaining to be done beyond T2S**

The T2S project has removed a significant number of the 15 Giovannini barriers for the relevant markets, in particular as a result of the common technical characteristics that are imposed on CSDs that participate in T2S and, consequently, on the markets that these CSDs serve. The following table gives an overview of how T2S, as well as the European CSDR (see Chapter 12) have contributed to the removal of the Giovannini barriers.

However, some of these barriers have proved difficult to eliminate, resulting in only limited development of cross-border settlement between domestic CSDs in central bank money. The trend towards market unification must therefore be completed, and the opportunity to continue and accelerate the harmonisation process has begun to materialise with the Capital Market Union (CMU) project. One of the components of this initiative launched by

the European Commission in 2015 was the setting up in early 2016 of a group of post-trade experts – the European Post-Trade Forum (EPTF) – to help the European Commission to develop legislative proposals and other initiatives in the post-trade landscape, including collateral management services, in line with the overall CMU objective of developing cross-border financing and financial investment within the European Union. The EPTF produced a report<sup>19</sup> in May 2017 on the impact of regulatory changes on the technical, legal and tax barriers to post-trade activities identified by the Giovannini Group. It also identified new barriers or impediments to the provision and use of post-trade services in the perspective of the CMU. In particular, it listed six barriers (some of which had already been identified in 2001 by the Giovannini Group), the removal of which has a high priority: the inefficient management of withholding tax, legal inconsistencies, the fragmented management of corporate actions and of shareholder meeting processes, the inconsistent application of segregation rules, the lack of harmonisation in the rules and processes for investor registration and identification, and lastly the complexity of the post-trade reporting structure.

Following the publication of the EPTF report, the European Commission launched a consultation in the autumn of 2017 to gather feedback from market players on the need for further harmonisation in the post-trade environment, the results of which will serve as the basis for its work in this area.<sup>20</sup>

19 [https://ec.europa.eu/info/publications/170515-eptf-report\\_en](https://ec.europa.eu/info/publications/170515-eptf-report_en)

20 [https://ec.europa.eu/info/consultations/finance-2017-post-trade\\_fr](https://ec.europa.eu/info/consultations/finance-2017-post-trade_fr)

Giovannini barriers	Contribution of the T2S platform to removal of the barrier	Contribution of CSDR to removal of the barrier
Differences at the IT (Information Technology) level	Yes	No
National restrictions on the place of clearing and settlement	Yes	No
Differences in the rules governing corporate actions	Yes *	Yes *
Intra-day settlement finality	Yes	Yes
Obstacles to remote access to national clearing and settlement systems	Yes	No
Harmonisation of the opening hours of settlement systems for all European Union equity markets	Yes	Yes
Harmonisation of operating hours and settlement deadlines with TARGET	Yes	No
National differences in market practices relating to securities issues	No	Yes *
National restrictions on the location of securities	No	Yes
Restrictions on the activity of primary dealers and market makers	No	No
All financial intermediaries established within the EU should be allowed to offer withholding tax agent services in all Member States	No	No
Any provisions requiring that taxes on securities transactions be collected via local systems should be removed to ensure a level playing field between domestic and foreign investors.	No	No
Absence of an EU-wide framework for the treatment of ownership of securities	No	No
National differences in the legal treatment of bilateral netting of financial transactions	No	No
National differences about how to resolve conflicts of laws	No	No
* The migration to T2S or the implementation of CSDR contributes to the removal of the barrier Source: ECB - T2S and CSDR contribution to the removal of the Giovannini barriers.		