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(Markets, Infrastructures, Payment Systems)

T2S - TARGET2-Securities

The pan-European platform for the settlement of securities
in central bank money

by Cristina Mastropasqua, Alessandro Intonti, Michael Jennings, Clara Mandolini,
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*Shortly after completing the first draft of this paper, Diego Toma suddenly
and prematurely passed away.*

This work is dedicated to his memory.

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T2S - TARGET2-SECURITIES

THE PAN-EUROPEAN PLATFORM FOR THE SETTLEMENT OF SECURITIES IN CENTRAL BANK MONEY

by Cristina Mastropasqua*, Alessandro Intonti*, Michael Jennings*, Clara Mandolini*,
Massimo Maniero*, Stefano Vespucci* and Diego Toma*

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ABSTRACT¹

The good functioning of financial markets requires safe and efficient infrastructures for the orderly conclusion of market transactions. The ESCB Statute mandates that the Eurosystem “ensure efficient and sound clearing and payment systems within the Union”. In line with this mandate, the Eurosystem has developed the settlement infrastructures TARGET2 – for large-value payments, TARGET2-Securities (T2S) – for securities, TIPS – for instant payments.

The present work focuses on T2S: the pan-European platform that manages in a harmonised way the settlement phase of securities transactions. The related cash transfers take place on the accounts that financial intermediaries hold with their central bank (settlement in central bank money or monetary base). The go-live of T2S in June 2015 was a milestone in European financial markets integration, as it took place in a landscape of domestic infrastructures that applied heterogeneous procedures and standards to the settlement of securities. Such heterogeneity represented a barrier to the realisation of the single capital market.

The T2S project was conceived to achieve public aims, such as defining and implementing the monetary policy of the Union, promoting the smooth operation of payment systems, and fostering financial market integration and the efficient allocation of capital in Europe.

The Eurosystem charged four central banks with developing the platform: Banque de France, Banca d'Italia, Deutsche Bundesbank and Banco de España (so-called 4CB). The project was launched in 2008. All Eurosystem central banks were involved in financing T2S development and operational costs: these must be recovered in full, with no profit margins, through the fees charged for the services offered to intermediaries.

Both T2S securities and cash accounts are located on the platform which, for this reason, is referred to as “integrated”. Settlement takes place on a gross basis, in central bank accounts; these features de facto eliminate credit risk arising from the insolvency of a counterparty. Together with robust business continuity measures, they make T2S a safe system that can substantially lessen systemic and operational risks. T2S can also operate in currencies other than the euro. Securities settlement in Danish kroner has been available on the platform since October 2018.

By offering standardised and equal services to all participating Central Securities Depositories (CSDs), T2S has meaningfully reduced the previous fragmentation in the settlement phase of financial transactions in Europe. Moreover, to access its services CSDs must harmonise their procedures according to pre-defined standards. The fact that there is a single fee on domestic and cross-border settlement has considerably lowered the transaction costs for subjects residing

¹ The authors thank Giandomenico Scarpelli and Pietro Steconi for their many suggestions; they are grateful to Paolo Carabelli (Monte Titoli), Mario Recchia (Intesa Sanpaolo) and Mauro Romaniello (UniCredit) for having agreed to send their written contributions, collected in Chapter 5.

in different countries, thus making the trading of securities issued outside national borders simpler and less expensive.

Nowadays, T2S serves as a point of reference in the European and global landscape of payment infrastructures. In 2020, there were 21 CSDs based in 20 European markets operating in T2S; in the same period, the platform settled more than seven hundred transactions in central bank money on a daily basis, with peaks of more than a million. The Eurosystem monitors platform operations on a continuous basis and shares the relevant information with market participants. Moreover, T2S is subject to Eurosystem oversight, applying to it the international principles defined for the assessment of systemically relevant infrastructures.²

After six years of operation, it should be possible to assess if the expected benefits of T2S have materialised and if new elements, brought forth by a changing environment, have come into play in the meanwhile. To this end, the three major Italian market participants that have used T2S since 2015 were interviewed on their experience. They are the Italian CSD Monte Titoli, the Intesa Sanpaolo Group and the Unicredit Group. Their individual reports provide evidence that the gains expected from T2S did largely occur, in particular for CSDs and banks. As far as issuers are concerned, their opinion is that any gains brought about by T2S have so far been limited.

T2S is in continuous evolution. The next goals will be integration with the other TARGET services and reinforcement of the resilience against cyber-attacks, where work is still in progress. The new distributed ledger-based technologies applied to securities settlement do not yet represent a challenge, as T2S functionalities in comparison are quite advanced. The issuance plan of the European Commission will likely have significant effects on the growth of the European capital market. It also represents an opportunity that the Eurosystem should seize to bolster T2S network effects by widening the spectrum of securities settled, their volumes and, ultimately, the business opportunities of the markets and operators who use it.

This paper is organised as follows: Chapter 1 describes the way T2S works. Chapter 2 illustrates the legal framework and governance structure. Chapter 3 and 4 focus respectively on the operations carried out by European financial communities in T2S and Banca d'Italia different tasks. Chapter 5 reports the experience of the three primary market operators of the Italian post-trading that are users of T2S from its go-live. Chapter 6 outlines the policies and projects at the basis of T2S evolution, the challenges of the new technologies and the available opportunities for enhancing the already central role of T2S in European post-trading.

² [Principles for financial market infrastructures](#) (PFMIs) published in 2012 by the Committee on Payments and Market Infrastructures (CPMI) and the International Organization of Securities Commissions (Iosco). The Eurosystem applies to T2S a subset of principles that it deems relevant for the infrastructure. See Committee on Payments and Market Infrastructures, International Organization of Securities Commissions (2012).

1.

THE ORIGIN AND OPERATION OF T2S

1.1. THE EUROPEAN AUTHORITIES' AND EUROSISTEM'S RATIONALE FOR OFFERING A SINGLE PLATFORM FOR SECURITIES SETTLEMENT

The start of the Economic and Monetary Union on 1st January 1999 called for setting up the foundations of a unified financial market in the Eurozone. The first step was the integration of the domestic money markets, so that the monetary policy transmission mechanism could operate swiftly and uniformly across countries. The connection of the different countries' settlement systems for monetary transactions allowed for a smooth transfer of funds across the banking systems. Soon after, the Eurosystem developed TARGET2, the single platform for the settlement of large-value payments in euro. Harmonising the settlement of financial transactions across countries has required more protracted effort and the direct involvement of both the Eurosystem and the EU Commission. The former launched the project for a pan-European platform for the settlement of securities (TARGET2-Securities, T2S) that went live in June 2015 and the latter issued the Central Securities Depositories Regulation (CSDR) in 2014.³

At the beginning of the 2000s the settlement of financial transactions in the euro area took place under different regulatory, legal and taxation rules that were the legacy of markets based on national currencies. The central securities depositories (CSDs) carried out the settlement of securities transactions in a monopolistic regime⁴ that allowed each of them to apply different market practices and technical standards.⁵ Each CSD charged higher fees for the settlement of a security issued outside national borders (cross-border settlement) than the ones applied to the settlement of a security issued in the same CSD (domestic settlement). The fee differential stemmed from the complexity of the procedures involved in cross-border settlement that imposed additional costs on the CSD back-office or required the CSD to pay intermediaries specialised in one or more foreign markets. The CSDs usually incorporated such costs into the settlement fee. Their banking clients, in turn, transferred the settlement cost to the final investor. To sum up, the price differential between cross-border and domestic settlement was due to the fragmentation of the European financial market and constituted a barrier to the efficient allocation of capital.

In a first report on cross-border clearing and settlement in the European Union the Giovannini Group⁶ – a consultative committee of the European Commission composed of experts coming from the European securities industry – estimated that the cost of cross-border settlement in the EU could exceed

³ See [EU Regulation 909/2014](#) on improving securities settlement in the European Union and on central securities depositories.

⁴ In addition to the 19 domestic CSDs, in Europe two international CSDs were specialised in the settlement of Eurobonds and securities issued by non-EU residents.

⁵ Technical standards include the settlement systems connection and communication protocols; market practices include message protocols, systems opening/closing times, the number of days between the execution of the transaction and its settlement.

⁶ See Giovannini Group (2001).

the cost of a domestic settlement tenfold.⁷ The report identified and listed 15 barriers making cross-border settlement more complex, riskier, costlier, and ultimately less efficient. Such barriers were categorised under the three main headings of (1) national differences in technical requirements/market practices, responsibility of market intermediaries, (2) national differences in tax procedures, responsibility of governments and (3) issues relating to legal certainty that may arise between national jurisdictions, responsibility of (national and EU) authorities. According to the report, lifting these barriers called for harmonising market practices and technical standards in use by specialised intermediaries, addressing the different rules and regulations applied by Member States to the taxation of securities and the barriers to legal certainty in securities clearing and settlement that affected European issuers and investors equally.⁸

1.1.1. THE MEASURES TO ACHIEVE FINANCIAL MARKET INTEGRATION: THE CSDR AND THE T2S PROJECT

The integration of the European financial market is a public aim, whose achievement has often required the intervention of EU authorities. In order to address the fragmentation in the European post-trading sector,⁹ in absence of a private initiative, the Eurosystem and the European Commission have undertaken two complementary strategies. The first one, of a technical and operational nature, has been to conceive and then realise the T2S platform. The second one, of a regulatory nature, has been the publication of the CSDR in 2014. The CSDR has introduced a single regulatory framework for the European post-trading sector and the activity of CSDs based on the CPMI-Iosco Principles¹⁰ for financial market infrastructures, to overcome the existing set-up with CSDs' business entirely governed by national regulations.

THE MAIN PROVISIONS OF THE CSDR

The CSDR harmonises securities settlement practices in Europe and the way CSDs operate, with the aim to increase safety and efficiency, in particular of cross-border settlement, achieve greater competition and increase the quality of CSD services at lower prices. The main provisions of the CSDR are:

- *settlement periods capped at two working days (T+2);*
- *dematerialization of all transferrable securities issued in the EU;*
- *payment of monetary penalties in case of settlement fails (settlement discipline);¹¹*
- *adoption by the CSDs of stringent requirements at the organisational, procedural and prudential level;*

⁷ The settlement fees applied by CSDs in Europe were also high in comparison with the ones charged by Depository Trust & Clearing Corporation (DTCC), the largest settlement system for privately issued securities in the US.

⁸ In a second report on cross-border clearing and settlement in the European Union the Giovannini Group presented the strategy for lifting the 15 barriers identified in the previous report. See Giovannini Group (2003).

⁹ See Annex A.6 for a description of the post-trading sector.

¹⁰ See Committee on Payments and Market Infrastructures, International Organization of Securities Commissions (2012).

¹¹ See the box: *The settlement discipline*, Chapter 6.

- *authorisation system based on a “CSD passport” to allow CSDs to offer their services in the EU with no need for further permissions.*

The passport is particularly important as it introduces the possibility for intermediaries to centralise securities in any EU CSD regardless of the country in which they have been issued, and is coherent with what is technically possible to do in T2S.

In 2007, the Eurosystem presented the T2S project to European authorities.¹² T2S was conceived as a technical platform to which participating CSDs would participate voluntarily to carry out the settlement of securities for their banking clients, crediting or debiting the corresponding value to the accounts in central bank money held by banks on the same platform.¹³

The T2S project was instrumental in achieving the Eurosystem’s public tasks of defining and implementing the monetary policy of the Union and promoting the smooth operation of payment systems. A platform owned by the central bank, with high safety standards, where euro area financial communities settle securities in central bank money would have reduced systemic risks, also thanks to the prevalent use of the delivery-versus-payment (DvP) procedure recommended by the CPMI-Iosco Principles.¹⁴ Common practices for all connected CSDs would have decreased the costs banks face when moving collateral cross-border, increasing its use in the refinancing operations with the central bank.

Moreover, T2S would have contributed to capital markets integration in Europe. Uniform settlement fees applied to all CSDs would have led to a generalised reduction in settlement costs, making them equal across countries, and fostered CSDs’ competition in value-added services. Investment in securities issued outside national borders would have been more affordable.

In welcoming the project, the Ecofin Council set a number of principles, among them the respect of EU competition rules and a governance structure that involves all affected market participants across the EU: CSDs, central banks and banks. According to the Council, all market needs should be represented in order for the benefits of T2S to reach the final users.¹⁵

The Governing Council of the ECB approved the project in 2008 and entrusted it to the three central banks that had developed TARGET2, i.e., Banca d'Italia, Banque de France and Deutsche Bundesbank, joined by Banco de España, collectively referred to as “4CB”. As in the case of TARGET2, Banca d'Italia and the Deutsche Bundesbank are responsible for the operations.¹⁶

¹² The design of T2S was presented to market intermediaries in a public consultation with the aim to assess the T2S business case; see European Central Bank (2008a), European Central Bank (2008b).

¹³ By settling the securities and cash on the same platform, T2S would apply the so-called “integrated settlement model”.

¹⁴ In DvP settlement the obligation to deliver the securities is made conditional on the successful transfer of the cash, and vice versa. The DvP settlement eliminates counterparty risk, i.e., the risk that either party in the transaction may lose the full value following the non-delivery or default of their counterparty.

¹⁵ See Council of the European Union (2007).

¹⁶ Banque de France and Banco de España provide their support on the modules they have developed.

1.2. WHAT IS T2S?

T2S is not a stand-alone settlement system, nor does it have the legal form of a CSD; rather, it is a technical platform, offered by the Eurosystem to CSDs (and, through them, to the entire financial community) to manage the settlement phase of transactions in the securities market in a harmonized way. In other words, T2S intervenes in the final phase (settlement) of the post-trading chain, while CSDs continue to offer to their customers all other basic and value-added services in full autonomy: custody services, notary function, asset servicing and corporate events management, tax services, etc. (see Annex A.6: Securities post-trading).

A second important feature of T2S is to offer settlement in central bank money, thanks to the close connection with the cash settlement system TARGET2, which provides the liquidity for the accounts allocated for the settlement of securities transactions. Like TARGET2, T2S operates on a gross basis, i.e. each transaction is settled individually and separately from the others.¹⁷

Finally, although primarily dedicated to settlement in euro, T2S is a multi-currency platform, designed to interact with CSDs that manage securities denominated in currencies other than the euro and with settlement systems other than TARGET2 for the corresponding provision of liquidity. In fact, at the end of 2018, T2S integrated the Danish kroner, thanks to the agreement signed with the Central Bank of Denmark and the migration of the Danish CSD.¹⁸

1.2.1. HOW T2S WORKS

The settlement of transactions in T2S takes place on the securities accounts opened by banks with CSDs (securities accounts, SACs) and on the cash accounts opened by banks at their central banks (dedicated cash accounts, DCAs). DCAs receive liquidity through transfers made from cash accounts

WHAT IS T2S?

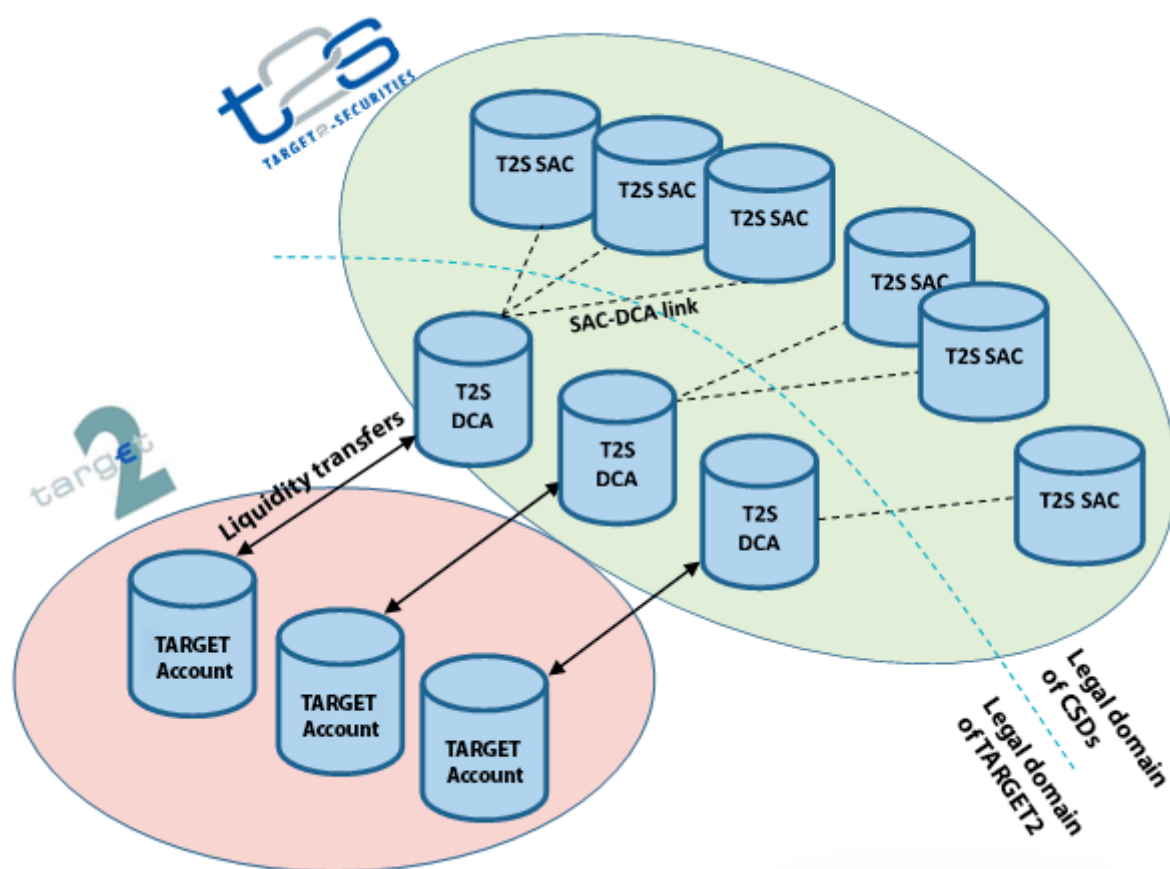
T2S is a technical platform, offered by the Eurosystem to the European market to manage, in a harmonized manner, the settlement phase of transactions in central bank money, leveraging its close connection with the euro payment system TARGET2. T2S is also a multi-currency platform. CSDs managing securities denominated in currencies other than the euro, as well as central banks that issue such currencies, can join T2S. Since the end of 2018, T2S settles securities denominated in Danish kroner.

¹⁷ The settlement of transactions in TARGET2, taking place on a gross basis between two operators, allows to mitigate the systemic risk caused by the possibility that the default of a single participant could have ripple effects on other operators, compromising the stability of the entire financial market (so-called domino effect).

¹⁸ The Danish CSD, VP Securities, participated in T2S as early as 2016 for settlement in euros only.

held by banks in TARGET2.¹⁹ This allows intermediaries to settle all securities transactions concluded on European markets using a single settlement account and at the same price for domestic and cross-border transactions, with advantages in terms of liquidity and collateral management. SACs must be linked to DCAs in order for the cash “leg” of a security transaction to be settled, however, the relation between SAC and DCA is not bidirectional. A DCA is usually linked to a plurality of SACs, not all necessarily open in the name of the same intermediary, which, in this way, can provide liquidity through its DCA to several SACs holders (Fig. 1).

Figure 1 – Relationships between TARGET2 and T2S accounts



T2S is open five days a week and operates following specific sequences within the operating day (see below the box: *T2S operating day*). Due to the close interdependence with TARGET2, the business day of the two systems is largely synchronized. Liquidity on DCAs flows from TARGET accounts, on the basis of liquidity transfers instructed by the banks’ treasuries,²⁰ at the beginning of

¹⁹ For settlement in currencies other than the euro, liquidity is transferred from the cash accounts held in the Real Time Gross Settlement System (RTGS) of the respective central bank.

²⁰ Bank treasuries can also set up automatic liquidity transfers, called standing orders, which are settled at the beginning of each new business day.

the new business day, which starts on the evening of the previous solar day with the Night Time Settlement (NTS). Once this phase is over, by 3:00 in the morning, the Real Time Settlement (RTS) is started; it is interrupted between 3:00 and 5:00 for maintenance activity (maintenance window) and ends shortly before 18:00 when all the liquidity still available on the T2S cash accounts is sent back to TARGET2: T2S, in fact, ends the operating day without liquidity.

T2S OPERATING DAY

The operating day is divided in several phases dedicated to the multiple business functions performed by the platform.

Start of Day (SOD) – 18:45: preparation for the night-time settlement is performed, including the validation of the instructions to be settled on the new business day. In addition, the new securities prices are processed and sent to T2S by the central banks, resulting in an update of the value of the positions and the collateral related to Eurosystem credit transactions.

Night time settlement (NTS) – 20:00: the night-time settlement consists of two cycles. In the first cycle, which comprises five sequences (0, 1, 2, 3, 4), corporate actions (maturities of securities, coupons and dividends) and liquidity transfers from TARGET2 are settled. Sequence 4 also settles Delivery Versus Payment (DvP), Free of Payment (FOP), Payment free of Delivery (PFOD). The second cycle comprises four sequences (4, X, Y, Z) also devoted to liquidity settlement as well as settlement of instructions not regulated in the previous sequences. At the end of each sequence T2S produces and sends the related reports to users.

Maintenance window (MW) 03:00 – 05:00: after the night-time settlement, routine system maintenance activities are carried out. During this phase T2S is not operational and all instructions received are queued to be processed when the system is reopened.

Real Time Settlement (RTS) 05:00 – 18:00: at the end of the maintenance activities, the real-time settlement, which includes five partial settlement windows, begins. In case the night-time settlement cycles are completed before 03:00, the RTS begins immediately and ends at the start of maintenance, to resume at 05:00.

End of Day (EOD) – 18:00: the settlement of instructions ends and the accounts reconciliation phase starts with the sending of end-of-day reports to participants.

In general, the night-time settlement uses cycles and sequences which, thanks to the use of optimization algorithms, bring it closer, in terms of efficiency, to the settlement on a net basis.²¹ In contrast, the daytime phase is characterized by the continuous input of new instructions (see the box: *The life cycle of a settlement instruction in T2S*, Annex A.1). In both phases each transaction is settled and booked on the accounts of participants individually.

The type of transaction most used in T2S is the so-called DvP (Delivery versus Payment), whereby the transfer of securities from the seller to the buyer is

²¹ The settlement on a net basis is based on the crediting, or debiting, of individual balances resulting from the clearing of more transactions between two or more participants, in order to minimize the use of liquidity and securities. Previously at the start of T2S, some central depositories (including the Italian one) used this settlement method during the nocturnal phase.

made at the same time as the transfer of the corresponding cash from the buyer's cash account to that of the seller (or their respective agents). However, this is not the only transaction type settled in T2S. Depending on the various business cases, the system also manages other transaction schemes, such as FOP (free of payment), i.e. the exchange of securities without payment (for example for purposes of transfers under warranty), the DWP (delivery with payment), i.e. the transfer of securities together with cash (used for example in interactions with central counterparties), the PFOD (payment free of delivery), i.e. the exchange of cash without exchange of securities (for example in case of coupon payment events).

Thanks to the interconnection with central banks and CSDs, T2S enables the management of the collateral allocated by banks to access the credit operations offered by the Eurosystem, including the intraday credit needed for the settlement in TARGET2. The eligible assets (securities and bank loans) are allocated by banks in dedicated systems, called CMS (Collateral Management Systems), managed by Eurosystem central banks (currently each central bank has its own CMS). CMSs interact on the one hand with T2S, which holds the accounts where the securities allocated as collateral are deposited, and on the other hand, directly with the TARGET2 platform where credit is granted to banks that request it.

T2S offers banks the auto-collateralisation functionality, through which intermediaries can obtain, on their DCAs, the necessary liquidity to purchase a security, against the provision of adequate collateral. In the event of insufficient liquidity, banks can benefit from two forms of auto-collateralisation: "on-flow", using as collateral the same security the intermediary intends to purchase, provided it is listed among the eligible assets according to the criteria established by the Eurosystem; "on-stock", allocating as collateral assets already available on the intermediary's securities accounts at the CSD. T2S first attempts to use as collateral the securities involved in the transaction itself (on-flow) and, if necessary, identifies additional eligible assets, previously indicated by the counterparty, available on the securities accounts of the latter (on-stock).

Auto-collateralisation is a form of intraday credit, therefore the funds must be returned to the national central bank before the end of the T2S operating day (16:30).²²

Moreover, auto-collateralisation is a liquidity-saving feature offered to banks for the purchase of securities. It reduces the number of failed transactions due to lack of funds, improving settlement efficiency and contributing to financial stability. The auto-collateralisation facility is normally provided by central banks to its participants, but it may also be offered by banks holding DCAs to client institutions at their discretion (client collateralisation). In both cases, with a proper configuration of the list of eligible assets, T2S manages the granting of auto-collateralisation automatically. Because of the positive externalities it

²² If funds are not returned to the T2S account due to lack of liquidity, in addition to charging a fee, the debit position is automatically transferred to the TARGET2 account of the counterparty. The collateral used for the auto-collateralisation, instead, is transferred to the pool account held by the counterparty with the central bank (so-called relocation of collateral), thereby increasing the intraday credit available to the bank.

generates, the Eurosystem has decided not to charge the auto-collateralisation with the central bank.

1.2.2. MAIN CONSEQUENCES OF T2S ON EUROPEAN POST-TRADING

The fact that all the intermediaries' cash and securities accounts are located on the same technical platform, regardless of the central bank or the CSD they are opened in, has greatly simplified the settlement of transactions involving two or more CSDs ("cross-CSD"). This is one of the most important changes introduced by T2S and, as already mentioned, among the reasons behind the development of the platform. Thanks to T2S an intermediary can in principle settle any security recorded in the system by using only one cash account and one securities account.²³

In addition, the participation of virtually all the Eurozone's CSDs has led, from the T2S go-live, to the convergence of fees applied to banks for securities settlement, since T2S applies a single fee to domestic and cross-border settlement. Even before going live, T2S contributed in a meaningful way to the harmonization of settlement practices in Europe, as the participating CSDs had to adopt the same procedures and technical standards to operate on the pan-European platform.²⁴ Therefore, thanks to T2S, many of the barriers identified by the first Giovannini report can be considered to have been lifted, in particular those of a technical or operational nature.²⁵ Thanks to the cooperation between the Eurosystem and market operators active in securities settlement the scope of harmonization has recently been broadened to include collateral management, with the aim to create, within a few years, an efficient and integrated market also for this sector.²⁶

²³ For this to happen T2S CSDs should open reciprocal accounts (so-called "links") to settle their customers' transactions.

²⁴ See Advisory Group on Market Infrastructures for Securities and Collateral (2018).

²⁵ For details on the barriers lifted by T2S, see European Post-Trade Forum (2017).

²⁶ See Advisory Group on Market Infrastructures for Securities and Collateral (2019).

2.

CONTRACTUAL ISSUES, GOVERNANCE AND PRICING

2.1. THE T2S LEGAL FRAMEWORK

Aside from the definition of the design and the technological solution, a project as complex as T2S also required a legal architecture that would guarantee legal certainty during the development and the operational phases to the parties involved: the Eurosystem, the CSDs and non-euro central banks that would make their currency available for settlement in T2S.

The [Guideline on TARGET2-Securities](#)²⁷ lays down the foundations of T2S in the specification, development and operational phases. It is supplemented by other legal acts and contractual agreements to be defined with the parties involved.

The preamble recalls that the decision to set-up the new service for the settlement of securities in central bank money stems from the Eurosystem's tasks²⁸ and includes full cost recovery among the T2S founding principles. It also defines the framework of the Eurosystem "internal" governance,²⁹ based on three levels. On the first level, the ECB Governing Council assumes the overall responsibility for T2S and is the ultimate decision-maker. On the second level the T2S Board, renamed as Market Infrastructures Board (MIB) in 2016, has the role to steer the project during and beyond the development phase.³⁰ On the third level, the four providing central banks (4CB) have the duty of developing and operating the platform. The tasks and responsibilities of the 4CB, the MIB and Eurosystem central banks as project financiers should be defined in a contract, called Level2-Level3 Agreement.³¹ One MIB responsibility is managing the relationships with T2S external stakeholders: CSDs, European banks and non-euro central banks willing to open cash accounts in their currency in the platform.

The Guideline also outlines the Eurosystem's governance relationships with T2S external stakeholders, establishing that T2S services can be offered to CSDs and non-euro central banks only after they have signed a contract with the Eurosystem: the [T2S Framework Agreement](#) and the [T2S Currency Participation Agreement](#) respectively. Both contracts are governed by German law.

²⁷ The Guideline on TARGET2-Securities was issued in 2010 (ECB/2010/2) and amended in 2012.

²⁸ Articles 17, 18 and 22 of the ESCB Statute. Article 22 assigns the Eurosystem to ensure efficient and sound clearing and payment systems within the Union.

²⁹ Governance arrangements set out the interactions among the parties in the development and the management of T2S and the decision-making procedures to define the strategy and the evolution of T2S functionalities.

³⁰ The T2S Board was established by Decision ECB/2009/, amended by Decisions ECB/2012/6 and [ECB/2019/266](#). The latter has established the MIB, the steering group responsible for the management and the evolution of the Eurosystem market infrastructures, including T2S. The MIB is chaired by a senior manager of the ECB and is composed of 13 members: nine from euro area national central banks, two from non-euro area central banks participating in the Eurosystem infrastructure services (TARGET2 and T2S), two non-central bank members without voting rights, with experience as senior officials respectively in the payments and the securities industry. Banca d'Italia appoints a representative to the MIB.

³¹ In 2012, the Governors of euro area central banks and the ECB President have signed the Level2/Level3 Agreement.

2.1.1. THE T2S FRAMEWORK AGREEMENT (FA)

A pre-requisite for accessing T2S settlement services is the signature of a contract between the CSD and the Eurosystem.³² The FA is a comprehensive contract, composed of 54 articles and 13 Schedules, that regulates the project and test stages, the migration of CSDs to T2S, and, finally, the start of the operational phase. The contract defines rights and obligations of the parties in each phase and the Schedules provide the necessary details.

The FA states that T2S is a technical platform to which CSDs voluntarily outsource the settlement of securities transactions carried out by their clients, while keeping the full control of their business and contractual relationships with them. T2S offers the same functionalities and services to all CSDs applying to them equal access conditions.³³ Among the duties of the parties are cooperation and information on all matters defined in the contract. The FA describes in detail: the governance arrangements between the Eurosystem and the CSDs mentioned by the Guideline, the scope of the liability and the related penalties,³⁴ the circumstances and conditions for contract termination by the parties.³⁵

2.1.2. EUROSISTEM'S NEGOTIATION WITH CSDs

In order to define the articles of the contract, in 2010 the T2S Board entered into a negotiation with the CSDs on behalf of the Eurosystem, concluding it two years later, at the end of 2011.

There are several reasons for the negotiation to have been long lasting. In the first place, it was necessary to agree on a reciprocal protection from the delay of T2S go-live and in CSDs' migration, on the losses or damages stemming from platform malfunctioning and CSD behaviour; the penalties applied in

³² The FA is signed on behalf of the Eurosystem by the Governor of the national central bank with the domestic CSD and by the ECB President with a CSD based in a non-euro area country. In 2011, the Eurosystem central banks have signed a Protocol granting each other a power of attorney to sign the FA with CSDs.

³³ In order to settle in T2S, a CSD must respect five "eligibility criteria". See Decision [ECB/2011/20](#) establishing detailed rules and procedures for implementing the eligibility criteria for central securities depositories to access TARGET2-Securities services.

³⁴ Article 32 (liability rules) lists the cases in which the parties are liable for gross or ordinary negligence in performing their duties and obligations under the Agreement. It sets the maximum total liability of the Eurosystem for gross and ordinary negligence at €500 and €30 million respectively per calendar year, in case of losses or damages caused to the other party. The maximum liability of a CSD for ordinary negligence equals the yearly fees it paid to T2S (or would have paid, in case of delay in migrating) in the preceding year and to five times this amount in case of gross negligence.

³⁵ Termination of a CSD can be invoked: (1) *for cause*, when the Eurosystem delays user testing by more than 18 months, or does not comply with the T2S Service description documents, without providing remedy within a specific deadline, or in case of material breach of the Agreement. The Eurosystem can terminate the contract if the CSD does not fulfil the access criteria defined in Decision ECB/2011/20; in case the CSD breaches one or more articles of the contract; when the CSD is put under insolvency procedure (and in agreement with the CSD's regulatory authorities). Either party can terminate the Agreement following a decision of the CSD regulatory authorities or a disagreement on a (material) functional change already approved. In case of disagreement, the parties must go through a dispute resolution and escalation procedure, to assess the causes and the possible remedies. The Governing Council makes the final decision. (2) *for convenience*: in such case, the parties cannot ask to terminate the contract until five years from the last migration wave (September 2017) have expired.

each case had to be mutually agreed. In addition, the Governing Council was always consulted before making a decision on such matters.

The FA has no termination date. Therefore, an issue that took time to be agreed on was the circumstances under which a party could terminate the contract. This was a delicate matter to both parties, above of all to the Eurosystem, which aimed to protect the value of the investment necessary to realise a project of such complexity. A relevant chapter was the definition of the T2S service level (Service-Level Agreement, SLA) that the Eurosystem and the 4CB must guarantee to the CSDs.

The Governing Council has consulted the European Securities and Markets Authority (ESMA) on all FA articles.

The definition of external governance was one of the most complex chapters of the negotiation. Differently from participation in TARGET2, that is compulsory for banks that want to access central bank refinancing, in T2S CSDs participation is voluntary. Although almost all European CSDs had signed in 2009 a Memorandum of Understanding (MoU) with the Eurosystem to support the development of a pan-European platform for the settlement of securities in central bank money, the positions on its governance remained distant. The first hurdle was the absence of a legal basis under which the CSDs would outsource their settlement business to a public entity: this legal basis was introduced by the CSDR later on.³⁶ Because by participating in T2S the CSDs would devolve a relevant component of the service offered to their clients, even if not a very lucrative one, they wanted to have a say in the definition of the technical features and the evolution of T2S. Had this request not been accepted, the risk was that CSDs would never have joined the platform and the project would have been a failure.

The compromise solution has been that CSDs keep the main responsibility for proposing changes to the functioning of the securities accounts. Equally, the Eurosystem could decide to reject those proposals that are not compliant with its tasks and responsibilities in the field of monetary policy and financial stability, hinder competition in the securities markets, and negatively affect the functioning and economic viability of T2S.

At the end of 2011, the FA has been sent to the 31 European CSDs and the Swiss CSD that took part in the negotiation with an accompanying letter by the ECB President, which also offered financial incentives to early migrators/early FA signatories.³⁷

Between April and June 2012 the FA was signed by 22 euro area CSDs, whose traffic represented 90 per cent of the volumes settled in the Eurozone, and five

³⁶ In Article 30.

³⁷ Signatories by 30 June 2012 would be granted: (i) a waiver of the one-off joining fee, equal to a quarter of the fees paid to T2S by the CSD during the first year after migration; (ii) a one-third fee reduction until the end of the first regular migration wave. Signatories by April 2012 could also take advantage of a three-month “fee holiday” from go-live.

non-euro area CSDs, including the Swiss one.³⁸ Therefore, a critical mass of the euro settlement traffic was expected to be transferred to the platform by the end of the migration period, initially foreseen for February 2017.

2.1.3. THE T2S CURRENCY PARTICIPATION AGREEMENT (CPA)

The CPA is a master contract offered by the Eurosystem to central banks of non-euro area countries, which consent to the settlement of securities in their own currency in T2S. The Danmarks Nationalbank (DNB) signed a CPA in June 2012. Following a request of the Danish market, it was agreed that securities settlement in Danish kroner (DKR) would start later on, in 2018.³⁹

The CPA regulates the rights and obligations in terms of project, test and migration planning and T2S service-level. The non-euro central bank is responsible for the connection with T2S of the domestic RTGS that settles domestic payments in the national currency. The CPA structure and contents are very similar to those of the FA. However, liability regime⁴⁰ and contract termination⁴¹ clauses are somewhat different. The CPA is complemented by Schedules describing articles provisions in detail.

Non-euro central bank participate in the decision making through their representatives in the MIB and in the non-euro currency steering group (NECSG), provided for in the external governance.⁴² The NECSG was set up when T2S started to settle in DKR.

Non-euro central banks do not finance T2S development and operating costs. They only pay for the use of T2S, as much as the CSDs do, for the operations they carry out and the information reports they subscribe.

³⁸ Among the euro area CSDs that did not adhere to T2S were the Greek CSD HELEX and the two International CSDs (ICSDs) Euroclear Bank and Clearstream Luxemburg. Euroclear Bank has recently expressed an interest in T2S participation (see Euroclear Bank, 2019). For the list of the 2012 CSDs that signed the FA in 2012, see European Central Bank (2012).

³⁹ Settlement in DKR started on 29 October 2018, when the DNB connected for the first time the Danish RTGS Kronos2 to T2S. On the same day, the Danish CSD VP Securities, that until 2016 settled in T2S only euro denominated securities, transferred the securities accounts in DKR to the platform.

⁴⁰ Article 28 (liability rules) sets the penalties for direct losses resulting from Eurosystem's ordinary and gross negligence respectively at a maximum of €20 million and €100 million per calendar year, vis-à-vis all non-euro central banks connected to T2S. Liability of a non-euro central bank per calendar year is capped at €2 million for ordinary negligence and €10 million for gross negligence. For the moment, these conditions only apply to the DNB. The Eurosystem's liability is uncapped in case of losses or damages suffered by the NCB and its connected parties (i.e., banks). In order to mitigate the Eurosystem's exposure the CPA provides for a clause to be introduced in the NCB's contracts with banks that prevents third parties from asserting a claim against the Eurosystem in relation to T2S services.

⁴¹ The CPA has no termination date. Each party may terminate the Agreement: (i) in the event T2S ends its operations; (ii) if the other party is in material breach of one or more articles of the Agreement; (iii) due to a major threat to the security or integrity of T2S stemming from the NCB's use of T2S, that it was not possible to remedy. In this case, the Eurosystem may immediately suspend its obligations under the Agreement. Differently from the FA, the Eurosystem cannot terminate the Agreement for convenience. A request for termination by any of the parties must be subject to the dispute resolution and escalation procedure defined in the governance arrangements, unless the parties deem that reaching an agreement is unlikely.

⁴² For the moment, the NECSG includes the DNB representative only.

2.1.4. EUROSISTEM'S NEGOTIATION WITH NON-EURO CENTRAL BANKS

The negotiation on the CPA took long time. It was carried out by the Eurosystem and six non-euro central banks (together with Denmark's central bank, there were also those of Sweden, Norway, Island, Switzerland and United Kingdom).

The main obstacle was the possibility to veto the new functional changes of T2S demanded by non-euro central banks in order to retain control over their currency, a task entrusted to them by their Statutes. Scandinavian central banks also requested that, in line with national law, State auditors may access the information relating to the platform and carry out on-site inspections. The Eurosystem decided to reject both requests, as they infringed the principle of independence enshrined in the EU Treaty and the Statute of the ESCB.

In 2011, the Swiss and UK central banks left the negotiation table, deeming that the dispute resolution and escalation procedure applied to new T2S functionalities did not sufficiently protect their statutory prerogatives.⁴³ Thereafter, also the Scandinavian central banks, with the exception of DNB, left the negotiation. One reason for it was the decision of non-euro area markets not to commit ahead of T2S go-live.

In 2012, the ECB Governing Council made the decision to freeze the CPA and refuse further requests coming from non-euro central banks wanting to bring their currency to T2S.

2.2. T2S GOVERNANCE

In 2007, the Eurosystem officially presented the T2S initiative to the Ecofin Council. The Council welcomed it and recommended to set up a governance structure that would involve all European market participants in a transparent and accountable way. The governance structure should in particular provide solutions for the handling of potential conflicts of interest in the development and the future operation of T2S.⁴⁴

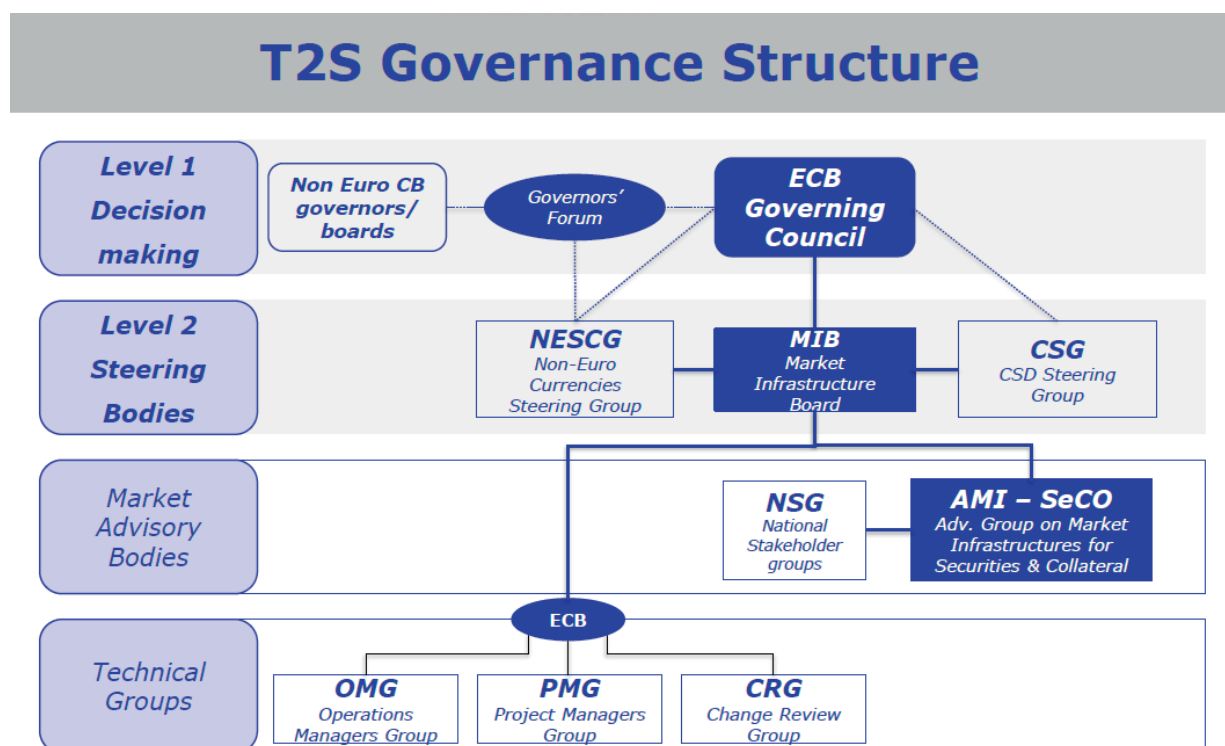
⁴³ The dispute resolution and escalation procedure described in Schedule 8 – Governance of the CPA provides for the involvement of the Governors of all central banks connected to T2S (in the Governors' Forum, see Section 2.2) to reach a consensual solution. Should this prove impossible, the Eurosystem's view prevails. The non-euro central banks retain the right to exit T2S within two years after the decision, during which period the change they rejected is not introduced.

⁴⁴ The Ecofin Council suggested a Separate Legal Entity (SLE) for that purpose, as a way of separating the operation and supervision of the system.

An ad-hoc task force, composed of representatives of market institutions, the European Central Bank (ECB) and some euro area as well as non-euro area central banks, explored a SLE model drawn from the organisational model of the United Kingdom's RTGS system, "CHAPS" at that time. The model consisted in two separate governance bodies: one in charge of all strategic and policy decisions concerning the service offered and one that owned the system application, invested and ultimately bore the financial risk. In the end, the task force deemed this set up as non-essential to cater for stakeholders' interests. The SLE model was not supported by the CSDs, intentioned not to lose control of the securities accounts, nor by the Eurosystem, which deemed this solution not in line with its statutory tasks. Moreover, the Eurosystem did not feel the project aims and its investment sufficiently protected by the separation of bodies envisaged by the SLE. In favour of an SLE were some of the banks, that viewed it as a way to ensure their participation in the governance of T2S, and non-euro area central banks, which felt it would better safeguard their statutory tasks. In the end, the SLE option was discarded in favour of a framework based on committees for each constituency, with roles and responsibilities outlined in their mandates. The T2S stakeholders would have to agree on how these bodies would interact in such a framework.

The governance arrangements described in this Section, became an integral part of the two contracts signed with CSDs and non-euro central banks, i.e., the FA and the CPA, respectively. T2S Governance officially entered into force in July 2012. However, the scheme in Fig. 2 was already working when the project started. A negotiation to define governance in detail ran in parallel to the one on the two contracts. Banks in the T2S consultative and technical groups have played a very important role in shaping it, as explained below.

Figure 2 - T2S governance



Source: European Central Bank.

Governance includes:

1. decision making bodies: As of today only the ECB Governing Council;⁴⁵
2. steering bodies: the Market Infrastructure Board (MIB), where both euro and non-euro central banks sit; the Non-euro Currency Steering Group (NECSG), composed of representatives from non-euro area central banks; the CSD Steering Group (CSG),⁴⁶ steering body of the CSDs, which expresses views and adopts resolutions on T2S issues;
3. market advisory bodies: The Advisory Group on Market Infrastructures for Securities and Collateral (AMI-SeCo), a consultative body that advises the Eurosystem on matters regarding securities clearing and settlement and collateral management, as well as T2S; it includes a wide community

⁴⁵ The Governor's Forum and Non-euro central banks' Governors/Boards have not been set up yet, as only one non-euro central bank is connected to T2S.

⁴⁶ The CSG mandate is in Schedule 8 – Governance of the FA.

of European financial market intermediaries, including national and international CSDs, banks, Eurosystem central banks and industry associations. The National Stakeholders Groups (NSGs) chaired by the national central bank, which gather market players active in the securities settlement business, their associations, and the financial market authority. NSGs report national markets' needs to the AMI-SeCo;

4. technical groups: they are composed of experts from central banks and CSDs, and report to the steering bodies of T2S governance; the ECB chairs them. The Operations Managers Group (OMG) is in charge of monitoring the day-to-day operations of the system and defining the operational procedures in normal and abnormal circumstances, gathered in the T2S Manual. The Project Managers Group (PMG) has followed the planned program during the development phase and is now responsible for defining the technical evolution of the platform (T2S releases). The Change Review Group (CRG) is in charge of examining and prioritising the proposals for technical and functional changes of T2S (change requests) put forward by CSDs and central banks. The Security Managers Group (SMG), coordinates and monitors activities relating to cyber resilience and information security. The SMG was set up in 2019 to support the Eurosystem and the connected CSDs in their actions to fend off cyber-attacks.

2.2.1. HOW HAS THE T2S GOVERNANCE WORKED?

The solution to involve external stakeholders in T2S governance has produced a complex system where the various decision-making bodies and technical groups interact with diverse responsibilities. Such complexity has had implications for the evolution of the platform, due to numerous change requests put forward by the CSDs and their banking communities during the development and operational phases.⁴⁷ Developing new functionalities has led the Eurosystem to bear additional costs that need to be recovered through fees.

European banks dealing in securities welcomed the T2S project from the beginning. However, being customers of the CSDs, not of the platform,⁴⁸ they feared that they might not be sufficiently involved in the decision-making process on issues affecting their business, such as T2S functionalities, operational aspects and services offered.

Eventually, the CSDs have accepted a representation of banks in their steering body and the technical groups that elaborate the proposals on operational and technical matters. The frequent use of public consultations⁴⁹ and participation in the AMI-SeCo have allowed banks to be constantly involved and express their views on European post-trading strategies in the securities business.

⁴⁷ Some change requests are triggered by changes in the regulatory framework. One such change is the penalty regime for settlement fails provided for in the CSDR settlement discipline, which led the Eurosystem to propose a mechanism in T2S to calculate penalties.

⁴⁸ The FA establishes that the CSDs are responsible for the business and contractual relationship with their customers.

⁴⁹ For example, the consultations on T2S User-Defined Functional Specifications (UDFS).

As for non-euro central banks, having gained only one participant in six years can hardly be defined a success for a multi-currency platform. CPA signature also by other central banks participating in the negotiation would have fostered adhesion of non-euro area CSDs with their markets, whose traffic altogether amounted to more than 80 per cent of euro settlement volumes. Had these volumes migrated to T2S, fees could have been lower and T2S cost-recovery prospects brighter.

The main challenge was to convince CSDs, especially the major ones, to be T2S clients. Future T2S participation can grow if Scandinavian countries' CSDs decide to adhere, together with their central bank. A more concrete possibility is that ICSDs, where European and international borrowers issue Eurobonds and debt instruments with an international outreach, decide to bring their volumes to T2S.

2.3. T2S PRICING POLICY

By signing the contract, CSDs commit to pay the fees the Eurosystem applies to T2S services.⁵⁰

The ECB Governing Council approved the T2S price list in November 2010, ahead of the signature of the FA by CSDs. In order to define the fee structure that would allow to recover T2S development and running costs within seven years from migration,⁵¹ the Eurosystem carried out simulations under different scenarios of CSDs' participation and growth in settlement volumes. Before approving the price list, the Eurosystem presented the simulations to participants in the European post-trading market, to get their views.

To allow for simplicity and clarity, all T2S fees are expressed in per cent of the DvP settlement fee. After a discussion with the market, the Eurosystem decided to set the fee at € 0.15 per DvP instruction, a level that also those markets where the cost of a domestic DvP settlement was low could accept.⁵² To reassure the CSDs that fees would not increase after T2S go-live (T2S participation would lead CSDs to abandon the proprietary settlement systems), the Eurosystem committed to a 10 per cent yearly increase in the four years after CSDs' migration. The commitment was subject to three conditions: that non-euro currencies add at least 20 per cent to the euro settlement volume; securities settlement volumes do not go below 10 per cent of projected volumes (based on market views); tax authorities confirm that the Eurosystem will not be charged VAT for the T2S services it provides. The tax authorities of Eurozone countries later confirmed the VAT exemption.

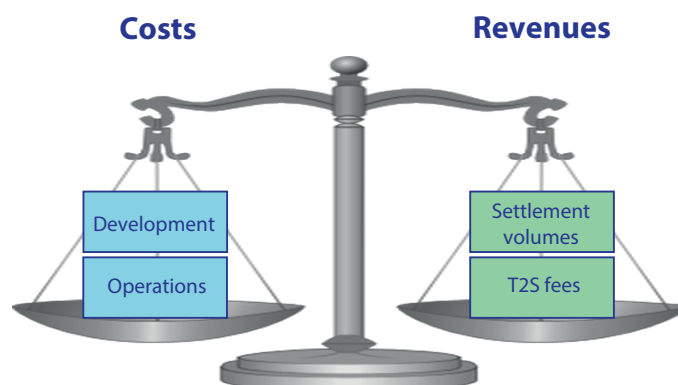
The fee structure that was eventually approved would have allowed for the recovery of T2S costs by 2022, eight years after go-live (one-year migration and seven years operation, Fig. 3).

⁵⁰ The T2S price list is included in the T2S Framework Agreement (Schedule 7, Section 2 "T2S Pricing policy") and the T2S Currency Participation Agreement (Chapter 4, Schedule 7).

⁵¹ The cost-recovery period covers both the project and operational phases, also taking into account the expected life cycle of the platform.

⁵² This was the case for Germany and Italy.

Figure 3 - T2S financial equilibrium



2.3.1. THE 2018 REALIGNMENT OF T2S FEES

The Eurosystem contract with CSDs gives it the right to modify T2S fees.

In 2018, the Eurosystem has initiated a revision of T2S fees with the involvement of connected CSDs and European banks. The aim was to safeguard cost recovery of both project and operating costs within a time span consistent with the platform life cycle. Cost-recovery is very sensitive to the growth in settlement volumes. Since 2010 volumes intermediated by T2S CSDs were constantly below Eurosystem and market participants' forecasts.⁵³ In 2017, the gap between the volumes settled by T2S CSDs and their estimate reached 33 per cent. Among the causes that negatively affected the number of transactions settled by T2S CSDs were the slowdown in market activity after the 2007-08 financial crisis and a widespread use of central counterparty in clearing repo operations. The delay in CSDs migration beyond two years,⁵⁴ from the planned one and a half, raised T2S costs and deferred revenues. A high number of new functionalities that made the platform design more complex have increased operational costs. More recently, the decision to enhance T2S cyber resilience to comply

WHAT DOES IT COST TO USE T2S?

The T2S pricing policy rests on the principles of full cost recovery, stability and simplicity of the fee structure. The fee for Delivery-versus-Payment (DvP), i.e., the main type of instruction settled in T2S, was increased from 15 to 23.5 eurocents from 1st January 2019. The CSDs pay the same fee for domestic and cross-border settlement. The new fee structure takes into account the review of the expected transaction volumes and the costs of the cyber resilience enhancements.

⁵³ In 2010-2017 the yearly growth in volumes intermediated by T2S CSDs was -1 per cent, compared to a forecast of 5 per cent.

⁵⁴ The 2012 migration plan provided for four migration windows between June 2015 and February 2017. Following the announcement of a 6-month delay by the CSD Euroclear France the migration plan has been revised, and the last window positioned in September 2017.

with the CPMI-Iosco Guidance for infrastructures of systemic importance⁵⁵ has been conducive to new costs.

In spring 2018 the Eurosystem presented to CSDs and banks in the AMI-SeCo the simulation work behind the new price structure. Following the contracts, it notified the new T2S fees six months ahead of their entry into force. From 1st January 2019, the cost of a DvP instruction, which is at the basis of the T2S fee structure, rose from 15 to 19.5 eurocents;⁵⁶ other T2S fees grew in proportion and the cost-recovery period was extended to 14.5 years, to December 2029. New fees should also allow covering the cost of T2S cyber resilience enhancements.⁵⁷

THE PRINCIPLE OF FULL COST RECOVERY

T2S operates on the basis of a full cost recovery principle, which imposes to balance costs and revenues. It implies that all costs incurred by the Eurosystem central banks for the development, evolution, maintenance and operation of the T2S platform be covered, within a set timeframe, by the revenues obtained through the usage of the platform, without generating profits for the Eurosystem as owner of T2S.

All cost components for activities, goods and the necessary services need to be assessed and allocated by the providing central banks, both in a direct (e.g. costs related to human resources or other operating costs) and indirect way (overhead costs),⁵⁸ to determine the cost of the service over a given financial period.⁵⁹

Defining the cost recovery plan and T2S fees needs factoring in different elements: the period of time to reach full cost recovery; the T2S pricing policy principles agreed between the Eurosystem and the CSDs; the revenues from the usage of the platform by customers – that in turn depend on the fees applied to the different services –; the expected and actual volumes.⁶⁰

Any decisions on the fees applied to T2S services fulfil the pricing policy contractually agreed between the Eurosystem and the CSDs. They are: full cost recovery, simplicity and equality in the application of the pricing scheme to all CSDs – which does not differentiate the fees on the basis of settled volumes – and stability of the fee structure.

⁵⁵ See Committee on Payments and Market Infrastructures, International Organization of Securities Commissions (2016).

⁵⁶ The new DvP fee includes a temporary surcharge of €0.04 per instruction, whose measure is linked to volumes growth.

⁵⁷ The new pricing structure takes into account the savings that the T2-T2S Consolidation project will bring about through synergies and greater efficiency across TARGET Services. See European Central Bank (2018b).

⁵⁸ Overhead costs are not directly linked to the production of goods and services (such as, for example, costs for the staff involved in the observed activity), but linked to the production activity as a whole, such as, e.g., costs for enabling and supporting functions.

⁵⁹ On a yearly basis, the European Central Bank issues the T2S financial statements, which report the financial results (revenues against incurred expenses) and balances, with regard to the fiscal year and the recovery period.

⁶⁰ See European Central Bank (2015).

3.

T2S IN OPERATION

3.1. THE LAUNCH IN PRODUCTION

T2S went live on 22 June 2015, about seven years after the launch of the project. During the lead up to the launch, Banca d'Italia was heavily involved in designing the application and infrastructure and providing support for all testing and migration phases once the first participants joined. During the T2S live phase, Banca d'Italia has been responsible, together with Deutsche Bundesbank, for the operational management of the platform and support for the participating CSDs and central banks.⁶¹

In carrying out these responsibilities, Banca d'Italia teams have provided to a range of users that has expanded over time the expertise gained in the operational management of TARGET2, as well as the skills developed in user support and in the functional, technical and infrastructural monitoring of the two platforms.

However T2S's going live did not occur as a single migration event for all participating central depositories and central banks: it was instead a process, planned to allow a staggered entry of the CSDs, which were grouped in migration windows ("migration waves").⁶²

The migration waves were distanced to stabilize the usage of the platform by each CSD with its customers, to enable the ECB and 4CB teams to provide support and ensure for each wave an orderly start-up, and to allow each financial community sufficient time to prepare.

Under the guidance of Banca d'Italia and the Italian CSD Monte Titoli, the Italian financial market migrated on 31 August 2015, making it one of the first markets to use T2S. At present, 21 central securities depositories active in 20 European markets have completed the migration process.

T2S FIGURES AT A GLANCE

In 2020, T2S settled more than 680,000 transactions per day, corresponding to a value of over €670 billion, with peaks of more than a million transactions in one day. In the last three years, the technical availability of the system has always been very high (equal to or higher than 99.7 per cent), falling below the target values on very few occasions. In 2020, platform efficiency in settling transactions was above 94 per cent.

⁶¹ See Chapter 4.

⁶² Five migration windows took place, respectively: the first window between 22 June and 31 August 2015; the second, on 29 March 2016; the third, on 12 September 2016; the fourth, on 6 February 2017; the final window, on 18 September 2017. The Slovakian CSD entered only afterwards, on 27 October 2017, while the settlement in Danish kroner and the entry of the French CSD ID2S occurred on 29 October 2018.

T2S AS A MULTI-CURRENCY PLATFORM

The T2S offering of central bank money settlement services is not limited to the euro. Indeed, one of T2S's most significant functionalities is multi-currency settlement. The original project design took into account this possibility, but it was not fully realized until October 2018, with the connection of Danmarks Nationalbank⁶³ through Kronos2, the Danish system for the settlement of interbank payments and collateral management, which enabled its central depository to settle Danish kroner-denominated securities.

Therefore, one share of T2S traffic is related to the settlement of the cash "leg" against currencies other than the euro. In 2020, inbound and outbound liquidity transfers between RTGS accounts on Kronos2 and T2S DCAs were respectively 46 and 152 on average per day,⁶⁴ corresponding to a daily value of more than 2.8 billion euros each.⁶⁵

In 2017, after the migration of the major CSDs (in particular, Euroclear France and Clearstream Frankfurt), T2S was already settling 90 per cent of the expected volumes from the entire migration phase.⁶⁶ In 2019, the number of transactions settled in T2S was seven times higher than in 2015, and the corresponding average value was 125 per cent higher.⁶⁷ In 2020, there were even more transactions than in 2019, exceeding 176 million in one year, even though the total value was lower.⁶⁸ The following chart shows how T2S traffic increased from go-live to the year 2020, and how the corresponding value evolved in parallel (Fig. 4).

Having completed the long, complex migration period, a stabilization phase and the introduction of several functional and application changes, nowadays T2S serves as a point of reference in the European and global landscape of payment infrastructures. T2S can stably settle in central bank money more than 700,000 transactions per day, with peaks of more than one million; for liquidity management, it connects to the TARGET2 and Kronos2 real-time gross settlement systems.

⁶³ In 2012, the Danish central bank signed with the ECB the T2S Currency Participation Agreement agreeing on the usage of its currency on the Eurosystem platform.

⁶⁴ T2S opening days coincide with those in the business calendar of the cash settlement systems connected to T2S: TARGET2 and Kronos2, whose calendars differ on 1st May, when only the Danish system is open; for this reason T2S is open on 1st May.

⁶⁵ Based on the exchange rate of 0.13 euro per Danish kroner. See European Central Bank (2021b).

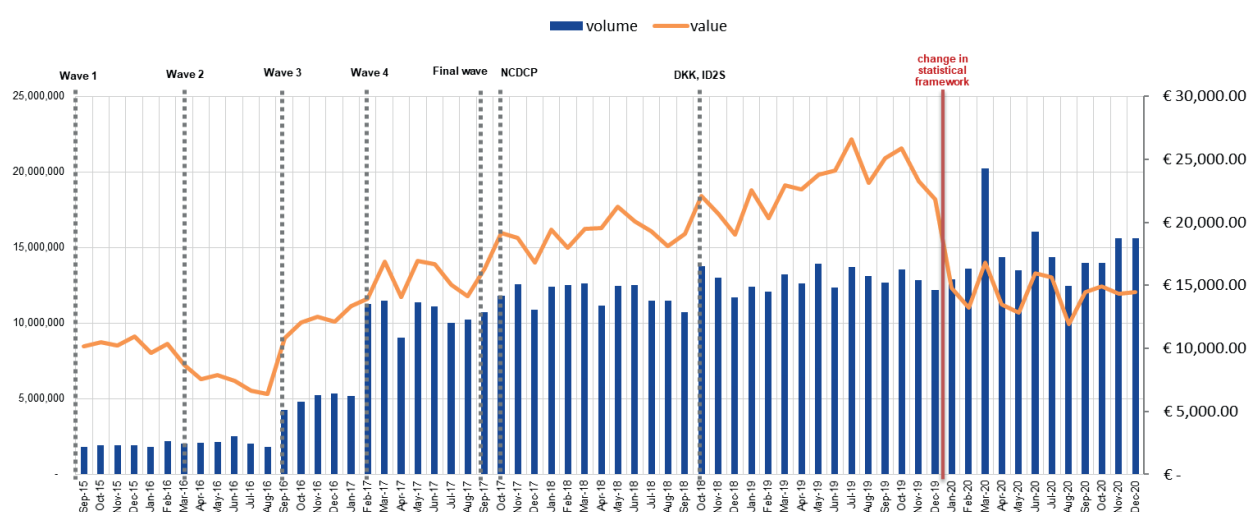
⁶⁶ European Central Bank (2017a).

⁶⁷ European Central Bank (2020), p. 4.

⁶⁸ The T2S statistical framework changed in 2020. By excluding some types of transactions from the calculation of the volumes (e.g., transactions automatically generated by the system, liquidity transfers from and to the RTGS dedicated cash accounts, with the purpose of better measuring settlement efficiency), it led to a decrease in their monthly totals. The new statistical framework, elaborated in 2019 and adopted in 2020, makes it difficult, therefore, to compare the figures for the last two years, and together with the SARS-COVID-19 pandemic's impact, partly explains the decrease in the reported data. For more information on the T2S statistical methodology, see European Central Bank (2020), box: *Changes in the T2S statistical framework*, pp. 6-9, and European Central Bank (2021b).

Figure 4 - Volume and value in T2S

(monthly totals; left-hand scale: number of transactions; right-hand scale: value, EUR billions)



Source: Elaboration of European Central Bank (2021b) data.

3.2. TYPES OF TRANSACTIONS, VOLUMES AND TRENDS

In order to understand the nature and magnitude of the work performed by this complex platform, it is worth reviewing some general information on how T2S operates in terms of traffic, settled value, types of transactions and their distribution during the business day, and settlement efficiency.

In 2020, T2S settled 176,681,247 transactions with a corresponding value of 172.84 trillion euros, that is 687,476 daily transactions on average, with a value of 672.53 billion euros,⁶⁹ including auto-collateral transactions. The latter are used to generate the cash needed for securities settlement, and in 2020 users resorted to them for a daily 103.45 billion euros on average.

Compared to the previous year, in 2019 T2S's overall traffic rose by more than 6 per cent in volume and 19.49 per cent in value. In 2020, volumes only grew by 14 per cent.⁷⁰ At the end of the year, there were more than 146,000 securities accounts and 800 cash accounts active on the platform.

T2S OPERATIONS DURING THE PANDEMIC CRISIS

In March 2020, the average daily number of transactions settled in T2S reached one million, with a peak above 1.088 million on 16 March and totaling more than twenty million transactions in the same month. To grasp the magnitude of these figures, it is worth referring to the previous year,

⁶⁹ European Central Bank (2021b).

⁷⁰ The settled value, instead, decreased by 38 per cent, due to the asymmetric impact on T2S volumes and values of the exclusion of liquidity transfers from the calculation. See European Central Bank (2021b).

when the highest daily volume was recorded in the month of June, with a little under 750,000 transactions processed in one day.

This sharp increase coincided with the spread of the SARS-COVID-19 pandemic in Europe, which led, during the first phase, to intense market turmoil and instability and a subsequent, significant rise in the number of securities transactions.⁷¹ Despite the large number of transactions that made use of almost all its elaboration capacity, T2S was able to guarantee service to the national and international banking and financial community. This was possible even in a completely new set-up, where 100 per cent of the support functions and Service Desk staff were working remotely to contain risk to health.⁷² Due to the extraordinary rise in volumes, a high number of unsettled transactions was also recorded, partly caused by market behaviour,⁷³ which led to a temporary drop in settlement efficiency values.⁷⁴

In the second half of 2020, the transaction monthly averages stood at the level recorded in the same period of 2019. The peak in the number of operations was recorded in May and June, with more than 900,000 daily transactions, and in November when they again exceeded one million.

Traffic distribution in T2S is not homogenous over the business day. Settlement may take place in the Real-Time Settlement (RTS) and Night-Time Settlement (NTS) phases.⁷⁵ In 2020, transactions settled during the NTS – when optimization mechanisms and auto-collateralization take place for liquidity savings purposes – were about half of the total in terms of volume and more than one third in terms of value.⁷⁶ The following charts show respectively the distribution of the settled volume (Fig. 5a) and the corresponding value (Fig. 5b) in 2020, during the night and day settlement phases.

The distribution of auto-collateralization operations (values) over the operating day is very close to that of total T2S settlements in value: more than 70 per cent of both take place during the RTS phase.

As already mentioned (see Section 1.2.1), T2S processes various types of transactions. The prevalent one is Delivery-Versus-Payment (DvP), representing 72.34 per cent of the total volume in 2020 for a daily average of 497,348

⁷¹ The Banca d'Italia Governor remarked: "The propagation of the virus has had serious financial repercussions, with a massive shift of funds towards assets deemed to be safer and an abrupt fall in market liquidity. The prices of oil, shares and the bonds of companies with lower credit ratings have plummeted. Sudden capital outflows have led to a marked depreciation in the currencies of the emerging economies. The risks of instability have greatly increased", in Banca d'Italia (2020), p. 3.

⁷² The major incidents that occurred in T2S in the following months were also effectively managed by a 100 per cent remote, geographically distributed team, due to the pandemic risk.

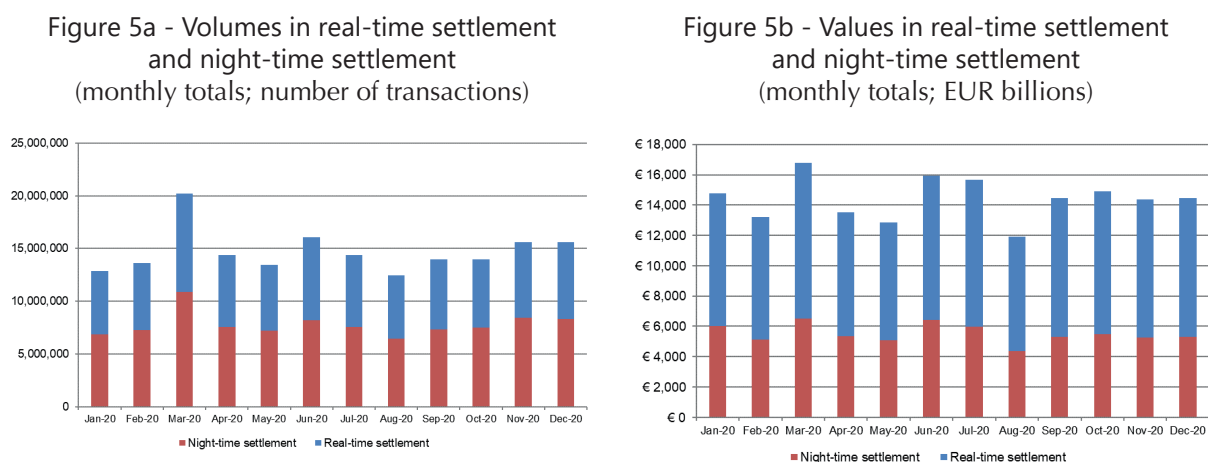
⁷³ In March, there were more than 20,000 unsettled transactions on average every day. This was probably due to a more frequent resort by market participants to the "on hold" functionality, allowing them to block a transaction settlement in case there is a lack of securities or cash. At the same time, the partial settlement/partial release functionality, which enables settlement of portions of transactions in case of lack of securities/lack of cash, was used less often.

⁷⁴ On settlement efficiency indicators see Section 3.3.

⁷⁵ For more details, see European Central Bank (2021b); on the sequence of the business day phases, see the box: *The business day*, Chapter 4.

⁷⁶ There is an inverse proportion, instead, for the transactions processed in RTS, representing a half, in terms of volume, and two thirds of the total in terms of value. See European Central Bank (2021b).

Figure 5 - Volumes and values in real-time settlement and night-time settlement



Source: European Central Bank (2021b).

transactions, and 96.38 per cent of the total value for a daily average of 648.20 billion euros.⁷⁷

DvPs are followed, in terms of daily average volumes, by Free-of-Payment (FOP) transactions, whereas Liquidity Transfers (from and to TARGET2 and the Danish RTGS) and other types of transactions⁷⁸ represent a minimal share. In terms of value, instead, liquidity transfers make up the largest share of daily average values.

The main types of securities exchanged in T2S are equities, entitlements and rights, debt instruments; their shares of total volume are respectively 58, 26 and 10 per cent, leaving 5 per cent for other types of securities.

Volumes and values of intra-CSD transactions (between participants in the same CSD) exceed cross-CSD transactions (involving participants in different CSDs) by more than 90 per cent.⁷⁹

About 16 per cent of monthly DvP transactions (in value) make use of auto-collateral, with a predominance of on-flow compared to on-stock functionality (Fig. 6).

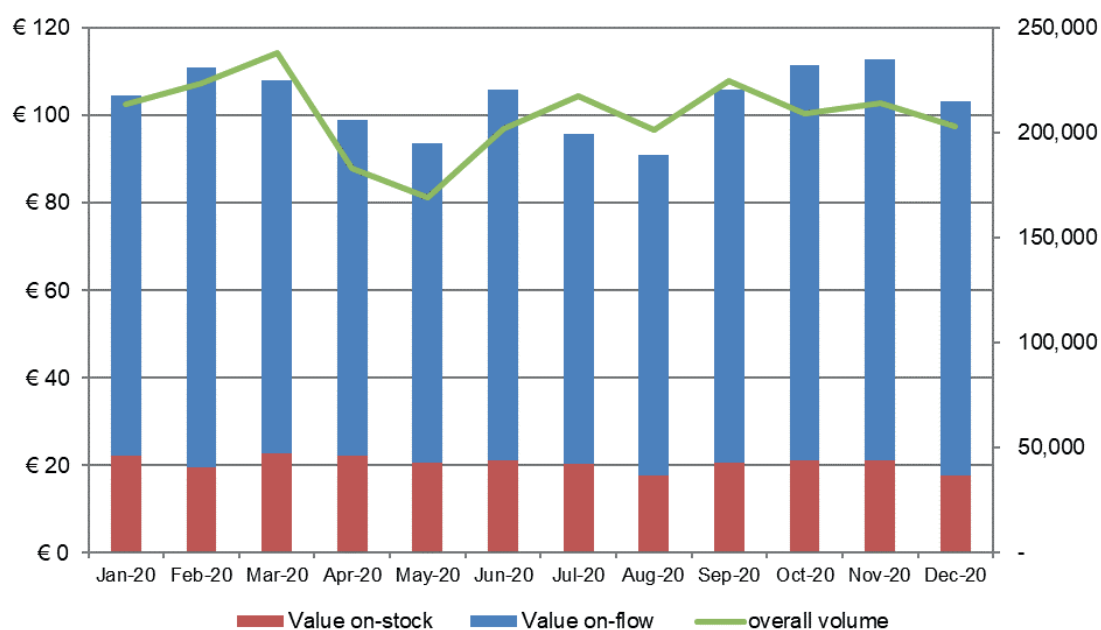
⁷⁷ European Central Bank (2021b).

⁷⁸ Delivery with payment (DWP), Settlement Restrictions on Securities (SRSE) and Payment Free of Delivery (PFOD).

⁷⁹ It should however be noted that this figure does not fairly account for the cross-border traffic in T2S. In fact, the statistics on cross-CSD traffic do not capture some peculiar technical configurations investors use to access different markets connected to T2S (such as, for example, transactions with external CSDs, or those taking place through custodian banks holding accounts with different CSDs). See Cross-border Market Practice Sub-Group (2017) for detail.

Figure 6 - Volume and value of auto-collateralization

(daily averages; left-hand scale: EUR billions; right-hand scale: number of transactions)



Source: European Central Bank (2021b).

3.3. PERFORMANCE, AVAILABILITY AND SERVICE LEVELS

The platform operation is constantly monitored and is regularly reported on by the 4CB and the Eurosystem to the CSDs, as set out in the contractual agreements. The T2S steering bodies, the MIB and the CSG, receive on a monthly basis a T2S Service Level Report and a T2S Operations Report, together with the T2S OMG. These reports provide information, respectively, on the observed service levels and the operations, by means of statistical data and a host of indicators.

Prompted by the CSDs, central banks and the 4CB, over time special and increasing attention has been placed on defining and improving the system performance indicators, as well as on improving the functioning of the platform and its actual usage by customers.⁸⁰ Following this analysis, a business-oriented settlement efficiency measure was introduced, which better takes into consideration the users' perspective.

T2S settlement efficiency measures the efficiency of the platform in settling transactions. It is calculated as the ratio of the number of settled transactions to the number of transactions inputted in the system for settlement.⁸¹ Since 2020, the reference indicator for this measure is the Market Settlement Efficiency

⁸⁰ As regards the improvements, it is worth mentioning the extension of the duration of the first and last partial settlement windows (these allow the settlement of portions of transactions) from 9 December 2019.

⁸¹ This ratio can be calculated in terms of both volume and value.

Indicator (MSEI).⁸² During 2020, this indicator fluctuated within the range 92.81-95.29 per cent in terms of volume and 88.95-96.12 per cent in terms of value,⁸³ below the average observed in the previous year (by 3.36 per cent in value and 2.50 per cent in volume,⁸⁴ Table 1). A considerable decrease in settlement efficiency took place in March 2020, in conjunction with the extraordinary increase in volumes during the outbreak of the pandemic: the MSEI dropped to 88.95 per cent in value terms and to 92.81 per cent in volume terms.⁸⁵

Table 1 - Evolution of T2S settlement data and settlement efficiency

	Value (EUR billions)			Volume (number of transactions)		
	2019	2020	change (%)	2019	2020	change (%)
Total	282,063.67	172,840.86	-38.72%	154,769,117	176,681,247	14.16%
Daily average	1,106.13	672.53		606,938	687,476	
Settlement efficiency (EoD)	97.63%	94.35%	-3.36%	96.93%	94.51%	-2.50%

Source: European Central Bank (2021b).

Notes: There were 255 operating days in 2019 and 257 operating days in 2020. Settlement efficiency is computed for 2019 using the platform settlement efficiency methodology and for 2020 using the Data Access Task Force (DATF) methodology.

The analysis of T2S performance in settling transactions went even beyond computing the MSEI. During 2020 special attention was paid to the study of an indicator that could take into account the CSDR methodology to achieve a harmonized measure of settlement efficiency across Europe.⁸⁶

The review of the statistical indicators of T2S operations has not been limited, in recent years, to the calculation of the settlement efficiency. The focus has been on (contractually defined) service levels and technical availability, which are regularly reported following the predefined criteria. In addition, there was agreement on a set of key performance indicators (KPI)⁸⁷ to measure the level of T2S service, including: the punctuality, related to the duration of the main business day phases; ⁸⁸ the already mentioned settlement efficiency; the technical availability of the platform, measured by the system response times

⁸² In measuring platform performance, the MSEI excludes instructions automatically generated by the system, liquidity transfers and corporate actions, while it includes a subset of transactions that are blocked and made unavailable for settlement (party on-hold). For a definition of the settlement efficiency indicators and the MSEI, see European Central Bank (2020).

⁸³ This decrease follows from the change in the calculation methodology, which includes the “party-on-hold” transactions among the unsettled ones. See European Central Bank (2021b).

⁸⁴ The figures refer to the Average of daily Settlement Efficiency (EOD) indicator, calculated on the whole business day.

⁸⁵ The figures are referred to the settlement efficiency at end-of-day. See European Central Bank (2021b).

⁸⁶ Reference is made to the outcome of the Workshop on Market Settlement Efficiency, established upon initiative of the T2S CSD Steering Group. The workshop developed a CSDR-based settlement efficiency indicator and compared it with the MSEI in terms of impact on the settlement efficiency calculation. Compared to the MSEI, the CSDR indicator considers on-hold transactions as unsettled and, for this reason, its records are below those of MSEI. For details, see European Central Bank (2021b).

⁸⁷ The Eurosystem sends to the CSDs a monthly report on the contractually binding service levels, according to Schedule 6 – Service Level Agreement of the T2S Framework Agreement, including in particular the KPIs.

⁸⁸ These are the phases of: Start of Day (SoD), Night Time Settlement together with NTS reporting (NTS+Reporting), and End of Day period (EoD).

(message response time per application-to-application mode, A2A, and user-to-application mode, U2A). The observed values are compared with reference target values and the results are regularly reported to the CSDs. The punctuality indicator is of particular interest to users. It represents the ratio of the actual duration of the main business day phases to their target duration. In 2020, the platform normally operated within the expected time, or even more rapidly⁸⁹ (Table 2).

Table 2 - Punctuality

(Actual average duration of the three phases on a monthly basis)

Phases of the business day	target duration	T2S Punctuality (2020)											
		jan	feb	mar	apr	may	jun	jul	aug	sep	oct	nov	dec
SOD (from BDCB to ESOD)	75 min (18:45-20:00)	55	66	122	50	35	43	39	33	33	34	38	37
NTS+Reporting	210 min (20:00-23:30)	119	128	212	103	103	83	74	61	68	76	86	83
EOD (from SEOD to EEOR)	45 min (18:00-18:45)	18	21	53	13	11	15	19	17	15	17	17	14

Source: European Central Bank (2021b).

A synthetic service level indicator, calculated as the weighted average of the various service levels, provides a measure of platform overall availability.⁹⁰ In the last three years, it has always been equal to or higher than the target KPI of 99.70 per cent, thus confirming that the T2S overall performance is very high. In March and May 2020 this indicator dropped below the target value: in the first case, this was due to the high volumes and consequent service delays, in the second case, the decrease was caused by a major incident that occurred on the platform.⁹¹

THE OPERATIONS OF THE ITALIAN FINANCIAL COMMUNITY

At the end of 2020, a total of 29 Italian financial market intermediaries were operating in T2S, holding 43 dedicated cash accounts (DCAs) with Banca d'Italia to settle securities transactions. Both the number of intermediaries and the number of DCA accounts have decreased compared to the peaks recorded respectively at the end of 2016 (36 operators) and at the end of 2018 (64 accounts opened at Banca d'Italia), due to the centralisation process of liquidity management implemented by some foreign banks.

In 2020, the Italian intermediaries operating in T2S settled an average of approximately 43,000 transactions per day, for an average daily value of 104 billion euros. As highlighted in Fig. A, both the volumes and the value settled on DCAs by Italian banks in 2020 are lower than the daily average recorded during the four-

⁸⁹ The only exception during 2020 was in March, in conjunction with the period of maximum traffic, as already mentioned.

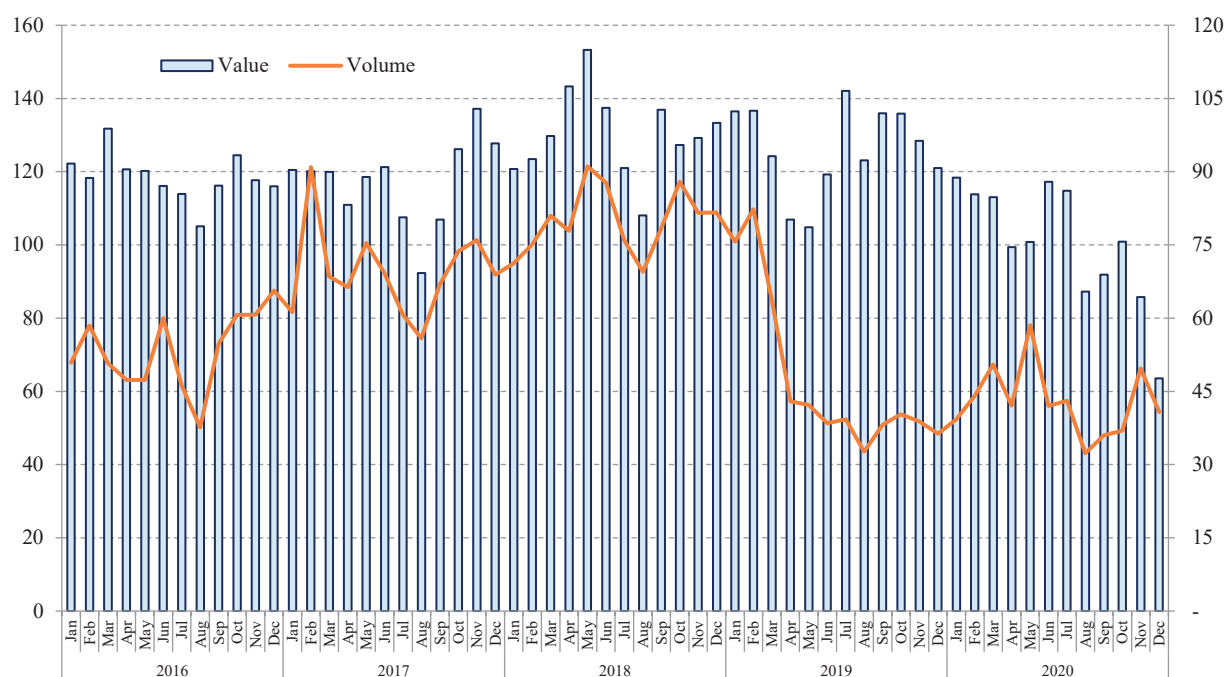
⁹⁰ The Service Level Indicator takes into account availability measures of various services (A2A and U2A connectivity, Life Cycle Management and Matching, Settlement, Liquidity Management, Statistics, Queries Reports and Archive, Operational Services).

⁹¹ The Eurosystem launched an independent review on the incidents occurred in 2020 on TARGET2 and T2S. The results and the Eurosystem's response have been published on 28 July 2021. See European Central Bank (2021c).

year period 2016-2019 (approximately 63,000 transactions and 125 billion euros). Such decrease (equal to 32 per cent in volume and 17 per cent in value) is largely due to two foreign operators who have centralized the liquidity for the settlement in T2S on another central bank. The peak levels of operations were recorded in 2018, with 80,000 transactions and 132 billion euros in value (daily average).

Figure A - Trend of value and of volume settled on the DCAs of Italian banks in T2S

(daily average; left-hand scale: value, billions of euros; right-hand scale: thousands of transactions)



Source: Elaboration of Banca d'Italia data (2021).

In 2020, transactions settled by Italian intermediaries on accounts opened in Banca d'Italia represented 12 per cent of the total amount settled in T2S by operators active in European financial markets. In terms of the number of transactions, Italy's share was 8 per cent. Again, there is a more pronounced decline starting from the second quarter of 2019: the peaks were in fact reached in the two-year period 2017-2018, when the Italian share was equal to about 25 per cent in terms of value and 20 per cent in terms of number of transactions.

In 2020, 87 per cent of transactions in volume, equal to 61 per cent of the total value, were settled during the night-time cycle, when there is more liquidity available, thanks also to the automatic use of auto-collateralisation.

The monitoring of the operations of individual intermediaries shows a high concentration of activity in T2S among few operators: in 2020, in fact, six banks settled 92 per cent of the total value.

A more detailed analysis of the use of auto-collateralisation reveals that the Italian counterparties have settled, on a daily average, about 85 transactions using this tool, for a value of 1.3 billion euros. Also in this case the trend is down from the peak levels of 2018 (about 2,800 transactions and more than 17 billion euros on a daily average), due to the closure, by a leading financial intermediary, of its DCAs held at Banca d'Italia. This reduction is also evident in relation to the overall value of the auto-collateralisation transactions carried out by operators active in European financial markets: around 1 per cent in 2020 compared to 24 per cent in 2018. In terms of value, in 2020 around 67 per cent of the daily auto-collateralisation transactions were generated in the night-time cycle and the remaining 33 per cent in the daytime cycle.

4.

THE DIFFERENT ROLES OF BANCA D'ITALIA IN T2S

4.1. INTRODUCTION

As stated in the first Chapter, the operation of T2S has been entrusted to Banca d'Italia and the Deutsche Bundesbank, which perform the same task in TARGET2. Together with Banque de France and Banco de España, they have developed the system during the project phase and currently manage its evolution as providers of the service. In addition to this responsibility, the Italian central bank supports the domestic financial community that settles cash and securities transactions in T2S. The Bank is also a user of the platform, through the intermediation of the domestic CSD Monte Titoli; it intervenes directly in T2S when acting as a central bank. It is involved in the oversight of the platform together with the other Eurosystem central banks and in the cooperative arrangement on T2S among the national and European market authorities. In line with the provisions of the T2S Guideline,⁹² the various functions of the Bank interacting with the platform are organised in a way that ensures separateness of the operational and oversight responsibilities. The following Sections describe in detail the different functions and roles.

4.2. DESIGN, MANAGEMENT AND SUPPORT TO THE EUROPEAN FINANCIAL COMMUNITY

As the service's provider and operator, the 4CB implement a function-based organizational structure. Each central bank participates in the design and management of the platform through teams dedicated respectively to functional design, application development, technical infrastructure and operational management. There are liaison groups for activities carried out by multiple central banks, under the coordination of two Central Managers with transversal responsibilities respectively for the evolution and operational areas.

As service provider, Banca d'Italia carries out both functional and development tasks; it also coordinates the activities carried out by the 4CB in the infrastructural area and has the operational responsibility of the T2S Service Desk⁹³ jointly with the Deutsche Bundesbank.⁹⁴

In this shared environment, Banca d'Italia carries out the following tasks:

- Functional, application and infrastructure management⁹⁵

As part of the design and development area, Banca d'Italia is responsible for a subset of components including the static data management and statistical information components, as well as the management of the operating day. In this context, it carries out analysis and development duties in addition

⁹² See Guideline (ECB/2012/13) on TARGET2-Securities, Article 8 (Good Governance).

⁹³ For a description of the tasks of the Service Desk, see Annex A.2.

⁹⁴ The 4CB apply Business Continuity Management (BCM) principles to reduce the probability of service interruptions and to define the necessary measures to ensure that affected processes may return to operations as quickly as possible (see Annex A.3).

⁹⁵ For a detailed description of the work related to this aspect and of the components under Banca d'Italia's responsibility, see Annex A.1.

to maintaining external documentation (functional specifications and user manuals), contributing to the evolution of the system and participating in specialized technical groups with the users.

Banca d'Italia is also responsible for the implementation and monitoring of the system's technical infrastructure. In this context, Banca d'Italia plays a central role as representative of the Eurosystem in the conduct of the tender for the selection and authorization of network service providers for T2S.

CONNECTIVITY IN T2S

Compared to TARGET2, the connectivity model of T2S is a significant innovation, allowing participants to choose between two authorised network providers rather than having only one available. This new approach made it possible to reduce costs for participants and improve the quality of the service. Legal entities connecting directly to the platform (Directly Connected Actors or DiCoA) can choose between two Value Added Network Service Providers (VANSP) licensed by Banca d'Italia in the name and on behalf of the Eurosystem to provide value-added connectivity services to T2S under market competition. Besides handling the public tender procedure for the assignment of licenses to offer T2S connectivity services, the selection of the VANSPs and the consequent signing of the two T2S License Agreements, Banca d'Italia had to ensure the compliance of the VANSPs' connectivity solutions and manage the intense preparation, implementation and acceptance test phases (Eurosystem Network Acceptance, concluded in September 2013). In 2019, the Eurosystem also assigned to Banca d'Italia a new mandate for licensing offers for the supply of connectivity services to the Eurosystem Single Market Infrastructure Gateway (ESMIG), i.e. the single channel for accessing TARGET services, which will also provide access to T2S from June 2022.

Banca d'Italia's work in this area did not end with the completion of the tender procedure and the subsequent assignment of licenses to network service providers for T2S connectivity, but it continues to this day with the regular and constant monitoring of obligations agreed in the T2S License Agreements, as well as the related technical and business requirements and service levels. To ensure the fulfilment of these tasks as Eurosystem representative in the management of contracts with VANSPs and the necessary communications, Banca d'Italia coordinates separate specific governance structures for each licensed company, consisting in steering and decision-making committees with service management and monitoring groups at technical and operational level.

- Support to the financial community

Banca d'Italia monitors and supervises the services' daily operation, providing support to central banks and CSDs (and commercial banks only for requests related to connectivity); managing incidents and restoring operations in the event of disruptions.⁹⁶

4.3. SUPPORTING THE NATIONAL FINANCIAL COMMUNITY

In addition to the 4CB functions described above, Banca d'Italia performs a role of support to the Italian financial community that operates in T2S by

⁹⁶ See Annex A.2.

monitoring the correct functioning of the market infrastructure and supporting the liquidity management within this platform.

Specifically, Banca d'Italia assists financial institutions holding DCAs in T2S (i) with the administrative management of contracts and personal data as well as in static data configuration, (ii) in monitoring the settlement activity of their transactions and the liquidity flows, (iii) in managing incidents (with the authority, in the event that a bank is unable to operate, to carry out cash transactions on behalf of the latter).

The entire support activity to the Italian financial community is carried out, as in the other national central banks, by the National Service Desk. This facility is responsible for all TARGET services and operates, under ordinary conditions, from 6:30 to 19:30 of each TARGET2 / T2S operating day.⁹⁷

4.4. BANCA D'ITALIA AS USER CENTRAL BANK OF T2S

Banca d'Italia operates in T2S both as a user and as a central bank. In the first role, it uses T2S to settle transactions carried out on financial instruments centralised in the CSDs adhering to the platform. Such transactions include: own trades and transactions carried out on behalf of some institutional customers;⁹⁸ the mobilisation of marketable securities held as eligible collateral in Eurosystem credit operations and for other specific purposes;⁹⁹ the transfer of shares of its own equity on behalf of participants;¹⁰⁰ the issuance of Italian Sovereign bonds.

As a central bank, Banca d'Italia operates in T2S (i) for the daily update of the list and the price coefficients of the securities that can be used for auto-collateral operations and for the

BANCA D'ITALIA'S ROLES IN T2S

Banca d'Italia fulfils several functions in T2S: together with Deutsche Bundesbank, it is responsible for T2S operations. It is also a user of the platform to settle its operations in financial instruments. As central bank, it provides the liquidity used in T2S by Italian financial institutions and, as supervisory authority, it participates in the oversight of T2S performed by the Eurosystem and cooperates with other financial market authorities.

⁹⁷ For further details on the activities carried out by the national operational table, see Annex A.4.

⁹⁸ Investment and custody services offered to public entities, other central banks or supranational bodies. For subjects based outside the euro area, the services are offered within the harmonised framework of Eurosystem Management Services (ERMS) defined by the Eurosystem.

⁹⁹ For example, collateral held against the bulk of bank drafts issued by commercial banks or for the management of any outstanding claims for banks that use the SEPA Direct Debit intermediation service offered by Banca d'Italia.

¹⁰⁰ L. 5/2014 art. 6, lett. 6 bis: "Transfer of shares takes place [...] through the booking of the accounts opened by Banca d'Italia on behalf of its participants".

management of non-repayment of intraday liquidity at the end of the operating day;¹⁰¹ (ii) for data acquisition:

- on the usage of liquidity in T2S, which supplement those relating to the use in TARGET2, to continuously monitor the overall liquidity position of banks in the Italian financial community;
- on the securities used by banks in auto-collateral operations, to apply some risk mitigation measures; these data complement those on the securities used by banks as collateral in Eurosystem credit operations, allowing to make comprehensive checks on the presence of close links between the bank borrowing liquidity (collateral giver) and the issuer of the security used as collateral;
- on the movements in the Bank's cash accounts held on the platform, for accounting purposes;
- on the detailed movements in the cash accounts of all operators of Italian financial community, for archiving and monitoring purposes.

Banca d'Italia decided to connect to T2S in "application-to-application" (A2A) mode for efficiency reasons and to contain the operational risk.¹⁰² In particular, for the above-mentioned activities linked to its central bank role, Banca d'Italia has connected to the platform as a direct participant, owing to the criticality and the confidential nature of the data processed. On the other hand, it chose to operate indirectly, via the technical interface offered by the central depository Monte Titoli, to settle financial instruments centralised in the CSDs participating in T2S, as previously mentioned, and to limit the adaptations of its own procedures.

4.5. T2S OVERSIGHT

The participation of almost all euro area CSDs to T2S and the fact that it settles the cash leg via the connection to TARGET2 – the systemically important payment system in euro – make T2S potentially relevant for the financial stability of the European financial market. Any outages or other disruptive events in T2S may well spread beyond the area of post-trading and have contagion effects on other segments of the European financial market that may endanger financial stability and the conduct of monetary policy.

In line with the tasks (i) to define and implement the monetary policy of the Union and (ii) to promote the smooth operation of payment systems, assigned to it by the Treaty and the ESCB Statute, the Eurosystem considers T2S a systemically relevant technological infrastructure, which should be subject to its oversight.

The main objectives of T2S oversight are to ensure the safety and efficiency of its services on a continuous basis and to foster the platform compliance

¹⁰¹ Liquidity granted via the auto-collateralisation facility and not reimbursed by 16.30 is transformed into intraday credit in TARGET2 and the related collateral is moved to the counterparty's pool account (relocation of collateral); see Section 1.2.1).

¹⁰² U2A access has been limited to residual functionalities or contingency cases.

with the relevant applicable regulations and oversight standards,¹⁰³ with the aim of reducing systemic risk and strengthening financial market resilience. Moreover, T2S should support the participating CSDs in complying with the regulatory requirements defined at the national level.

The monitoring action based on the oversight standards applies to different aspects of T2S functioning: legal basis, governance arrangements, settlement finality¹⁰⁴ and the procedures to be applied in case of default of CSDs or their participants, the management of operational risks, settlement efficiency, the communication procedures and standards as well as the disclosure of rules, procedures and market data.

The T2S oversight is a Eurosystem responsibility, which performs this task under the guide of the ECB that leads and coordinates all oversight activities related to the settlement platform. These consist in assessing the platform performance according to the Principles for financial market infrastructures (PFMIs) and monitoring the management of plausible sources of risk associated with the development and operation of the system. Owing to the specific nature of technical platform for the settlement of securities, only a subset of the PFMIs can apply to T2S.

The T2S operator is asked to regularly provide the oversight function with a wide set of information, including (i) statistical data on settlement efficiency, system availability, degree of payment concentration; (ii) operational information including on outages and incidents, new releases; (iii) organisation and strategies, such as changes in the legal framework or the governance, pricing policy, etcetera.

With regard to T2S oversight, the Eurosystem Market Infrastructures and Payments Committee (MIPC) where all euro area central banks are represented provides the decision-making bodies of the ECB with its assessment of both the conduct and outcome of T2S oversight activities by means of regular reports.

The T2S cooperative arrangement

The PFMIs also define the responsibilities of the relevant financial authorities to cooperate with each other both domestically and internationally.¹⁰⁵ In the

¹⁰³ In April 2012, the CPMI and the Technical Committee of the International Organization of Securities Commissions (IOSCO) published a set of international standards for the supervision of systemically important payment systems, central depositories, securities settlement systems, central counterparties, and trade repositories known as [Principles for Financial Market Infrastructures](#) (PFMI). In 2013, the Eurosystem has adopted them to perform the oversight of financial market infrastructures falling under its responsibility. The 24 principles are subdivided into areas that are important for the systems' secure and efficient functioning, such as: general organization; credit and liquidity risk management; default management; general business and operational risk management; efficiency; transparency; and access of direct and indirect participants. They are followed by a list of five responsibilities falling to monetary authorities, with a view to ensuring the efficient regulation and supervision of the market infrastructures. See Committee on Payments and Market Infrastructures, International Organization of Securities Commissions (2012).

¹⁰⁴ CSDs and Securities Settlement Systems (SSS) must comply with the Directive on settlement finality in payment and securities settlement systems ([Directive 98/26/EC](#)). Principle no. 7 of the [T2S General Principles](#) states that: "the finality of the settlement in T2S, meaning the unconditionality, irrevocability and enforceability of the settlement processed in T2S, has to be determined by reference only to the accounts located in T2S."

¹⁰⁵ PFMI Responsibility E.

case of T2S, the authorities involved are the national competent authorities for the supervision of those CSDs participating in T2S, their overseers (largely the national central banks), the central banks of issue for currencies settled in T2S, the ECB and the ESMA, as coordinator of the supervisory competent authorities. The above-mentioned authorities have signed a Memorandum of Understanding (MoU) setting out the details of the cooperative arrangement to exchange information and coordinate T2S supervisory activities.

Banca d'Italia participates in the Eurosystem's oversight of T2S and in the cooperative arrangement in its role of national competent authority, together with the Italian financial markets authority (Consob), for the supervision of the Italian CSD Monte Titoli.¹⁰⁶

¹⁰⁶ The Italian Consolidated Law on Finance (Testo Unico sulla Finanza) gives Banca d'Italia and Consob powers to issue regulations, grant authorisations and carry out monitoring of the central depositories. Supervision is conducted "according to purpose", with Consob responsible for transparency and investor protection and Banca d'Italia responsible for stability and the containment of systemic risk. The central depository service was entrusted to Monte Titoli by ministerial decree, passed in 2000, regarding government securities and by a resolution of Consob issued in 2001 regarding financial instruments in general. Only one central counterparty is authorized in Italy, Cassa di compensazione e garanzia S.p.A.

5. EXPECTED BENEFITS FROM T2S: THE ITALIAN OPERATORS' ASSESSMENT

5.1. EXPECTED BENEFITS ACCORDING TO THE ECB ECONOMIC IMPACT ANALYSIS

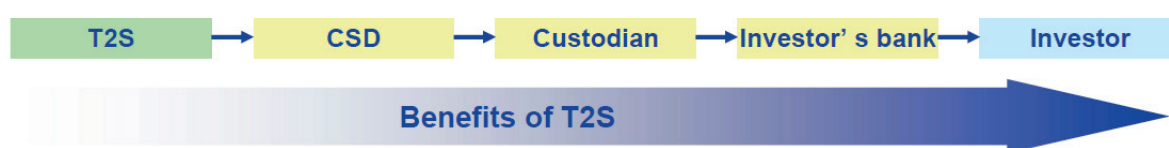
In 2007-08, before launching the project, the Eurosystem conducted a feasibility study of T2S, involving post-trading industry operators, banks and central securities depositories,¹⁰⁷ with the aim to produce a first assessment of T2S benefits for the Eurosystem, the different categories of post-trading operators and the economy as a whole (see Section 1.1.2).

The outcome of the study was that, thanks to T2S:

- CSDs would realise net savings on investments to renew and maintain their proprietary infrastructures, most of which were obsolete, that would be dismissed when moving settlement to T2S;
- the fees that banks and investors pay for cross-border settlement would be lower and equal to those paid for domestic settlement. Furthermore, banks could centralise in one T2S CSD the management of all the securities issued or kept in different T2S CSDs; they could concentrate their liquidity in a single central bank, cutting down operational costs, especially back-office ones;
- domestic issuers could reach all European markets; investors, especially retail ones, could diversify their financial portfolio across countries at a lower cost.

T2S would also boost competition among CSDs and banks in offering post-trading services. Dynamic effects would come into play, through new operational arrangements that would create business opportunities for financial intermediaries (Fig. 7).

Figure 7 - Settlement value-chain and pass-through of T2S net benefits



Source: European Central Bank (2008b).

5.2. THE ASSESSMENT OF THREE ITALIAN OPERATORS: THE CSD MONTE TITOLI, INTESA SANPAOLO GROUP, UNICREDIT GROUP

T2S has been in operation for almost six years; a sufficient time to assess whether the effects envisaged in the study have materialised, whether new elements have emerged and, in general, whether the Eurosystem has achieved its objectives. To this end, three leading Italian market players, T2S users

¹⁰⁷ The feasibility study was made of a methodology definition (T2S Economic Impact Analysis) and an assessment (T2S Economic Impact Assessment). See respectively ECB (2008a) and ECB (2008b).

since 2015, were asked to assess their own experience: the central securities depository Monte Titoli, Intesa Sanpaolo for custodian bank activities and UniCredit for multi-country treasury activities carried out by the holding company.

From the evidence provided by the three operators, it emerges that the expected effects have been largely achieved, at least for CSDs and banks; as regards the issuers, the interviewees feel that T2S has brought limited benefits so far.

According to Monte Titoli, with investments approximately double those initially forecasted, joining a single settlement platform has allowed, over time, to achieve savings on upgrades sharing costs with other CSDs. The harmonization of post-trading practices has facilitated access to foreign markets, the expansion of links with other European CSDs and the acquisition of new international customers. Last but not least, the cost of cross-border settlement has been significantly reduced, even though for Monte Titoli the weight of this component is still low, compared to domestic settlement. The benefits were then partly passed on to their customers through a restructuring of the fee scheme and the development of valued added services.

Intesa Sanpaolo's experience is that of an intermediary who was able to seize in time the opportunities opened up by T2S to offer flexible and diversified services required by a rapidly changing market. For Intesa Sanpaolo, T2S represented a possibility to define the strategy in its own financial asset management and reshape the offer of securities services to institutional investors, for whom the bank operates as a global custodian. By adapting their own operational model to take advantage of the synergies offered by the platform, the bank rationalised costs and improved the efficiency of internal processes, revising its commercial offer to be more competitive compared to other custodian banks at regional and global level.

According to UniCredit's experience, with the launch of T2S, their centralised treasury was able to take advantage of synergies with TARGET2 to strengthen the monitoring of the bank's global liquidity position and define the right buffer to be held in the very short term in the management carried out for the whole group, reducing the cost of funding. The use of the new functionalities, such as the auto-collateralisation, allowed the optimization of liquidity for the management of the bank's critical payments.

**MARKET
PLAYERS'
ASSESSMENT
AFTER
SIX YEARS**

In the opinion of three leading operators in the Italian post-trading sector, T2S's expected effects have been largely achieved, at least for CSDs and banks, thanks to the reduction in cross-border fees and the harmonisation of post-trading practices, which have led to lower costs, have fostered competition and the offering of new services. As regards issuers and investors, T2S has produced limited benefits so far. The removal of the remaining barriers to post-trading – including the different tax procedures – will make it possible to fully exploit T2S's potential.

Operators report what can still be improved: to date, not all collateral used in Europe to guarantee the credit granted by the Eurosystem is settled in T2S; in fact, international debt securities (Eurobonds) are issued in the two European ICSDs, which have not yet joined T2S. Furthermore, the incomplete development of CSDs' links requires banks to maintain accounts in several CSDs in order to operate on a European scale. Interoperability with other countries' systems is still burdensome because of the heterogeneity of tax procedures; the integration of European post-trading will remain incomplete as long as these are not harmonised.

The following testimonies reflect the responses provided by the three operators to interviews; the texts were approved by the interviewees both for the contents and for the publication in this paper.

5.2.1. THE EXPERIENCE OF THE ITALIAN CENTRAL SECURITIES DEPOSITORY MONTE TITOLI

Monte Titoli was established in 1978 on the initiative of Banca d'Italia and with the participation of commercial banks and stockbrokers, with the purpose of centralising private financial instruments under Italian law. Since 1978, it has operated as the Italian central securities depository¹⁰⁸ and, since 2000, the centralisation has been extended to Italian sovereign bonds¹⁰⁹ and then to financial instruments in general.¹¹⁰ From 2002, Monte Titoli has been part of Borsa Italiana Group, which in 2007 merged into the London Stock Exchange Group. In 2021, the European federal Group Euronext has taken over Borsa Italiana Group, finalising the acquisition process in April. In 2020, Monte Titoli managed over 40,000 financial instruments and a custody value of 3,300 billion euros. With over 200 participants (banks and brokers), it offered services to 2,600 issuers, including international ones, operating as an investor CSD¹¹¹ through links with depositories of 19 international markets.

Reasons for joining T2S

The reasons that led Monte Titoli to join T2S stemmed from the complexity of European post-trading industry before the advent of the centralised Eurosystem platform; a highly fragmented ecosystem characterised by countless specificities at a national level.

In this context, T2S would have represented the opportunity to level out the settlement process in Europe and catalyse the harmonisation of market practices also in the field of custody and asset servicing. Moreover, the creation of a European standardised system for post-trading would have allowed Monte Titoli's participants to access financial instruments centralised in other CSDs

¹⁰⁸ L. 289, 1986.

¹⁰⁹ Min. Decree of 23 August 2000.

¹¹⁰ For further information about centralised management services of financial instruments, see [Banca d'Italia website](#).

¹¹¹ The term investor CSD is used in the context of links between CSDs. The investor CSD opens an account with the issuer CSD to allow the cross-border settlement of transactions.

at lower costs and more efficiently, thanks to the removal of country-specific operational barriers.

Investments and savings

Joining T2S involved two main technical initiatives: the discontinuation of Express II, the settlement system in use at the time that dated back to 2004, and the integration of its custody system with the Eurosystem platform.¹¹²

In addition, adaptation work was carried out to comply with the standards set at European level for the harmonisation custody and asset servicing practices.¹¹³ A growing commitment was therefore made over time, reaching its peak in the period 2014-15 and allowing the Italian market to be among the first to migrate to the new platform.

The investment costs for the connection of Monte Titoli to T2S are now in the final amortization phase, while costs related to harmonisation remain; this is an ongoing process and is considered a medium-long term investment, although complimentary to their T2S commitment.

Participation in T2S has certainly allowed Monte Titoli to adopt a state-of-the-art settlement system, avoiding investments for the maintenance of the existing infrastructure Express II.

For instance, all functional adjustments for matching and settlement activities required by CSDR led to very marginal investments for CSDs participating in T2S, as the new functionalities were already available, thus demonstrating the modernity of the platform. CSDs not participating in T2S, on the other hand, had to take full responsibility for the necessary upgrades. More recently, the implementation in T2S of a centralised service for the calculation of penalties on settlement fails, also required by the CSDR, and the implementation of the necessary measures to ensure the cyber resilience of the system represent two clear examples of significant investments that can be shared among participant CSDs thanks to T2S.

From an operational point of view, the adoption of a single settlement platform among several CSDs has allowed the sharing of operational costs with important savings. Yet, since T2S is a shared platform, with shared governance, additional complexities have emerged. Not only has decision-making autonomy been lost, sometimes inefficiencies related to incidents occurred in other markets/CSDs have also affected the service offered by Monte Titoli.

Economic benefits for customers

The standardisation of the settlement process into a single platform, together with market practices harmonization, has allowed Monte Titoli to have a

¹¹² The first cost estimate was €15 million, calculated when the specifications were still at an embryonic stage and the go-live expected for 2013. Later, with a more in-depth analysis of the user requirements and especially as a consequence of the postponement of the platform's launch to 2015, investments have doubled to €30 million, due to the need to maintain external resources hired for the purpose.

¹¹³ Reference is made to the T2S settlement harmonisation standards for the settlement on the platform (see Advisory Group on Market Infrastructures for Securities and Collateral, 2018) and to other [market standards](#) defined by the Corporate Actions Joint Working Group (CAJWG) for corporate actions management.

simplified and intermediary-free access to the post-trading systems of other EU countries. Formerly, in fact, Monte Titoli was often forced to use an agent bank to offer the cross-border settlement service to its participants.

On the other hand, it is also true that domestic settlement fees in T2S, after the last increase in 2018, were significantly higher than those applied by Monte Titoli at the time of Express II; although fees are surely competitive for cross-CSD transfers, the volumes of the latter remain currently very low.

However, with the introduction of T2S and by outsourcing the settlement of transactions to the new platform, Monte Titoli has deemed it appropriate to review its fee structure, with two major actions.¹¹⁴ This strategy has allowed Monte Titoli to pass on to its participants the benefits deriving not only from the greater efficiency gained by joining T2S and the adoption of harmonised practices, but also from the continuous improvement of its internal processes.¹¹⁵

The process of harmonisation of internal procedures to the set standards, which in each country involves the central securities depository and the entire community of operators, entails an investment cost and sometimes a change of the operational practices in use. Monte Titoli has been working for some time on the harmonisation together with the Italian market and in cooperation with Banca d'Italia, with positive effects highlighted both by the direct access of foreign operators and by the development of its role as investor CSD.

Nonetheless, various specificities at national level still make access to other countries' systems burdensome. Among these, the issue of diversity in tax practices is crucial. As long as these practices are not harmonised, the investor CSD role cannot be fully developed and will suffer chronic limitations.

Finally, Monte Titoli considers as equally important the new operational practices allowed by the launch of T2S. Currently, several customers have reshaped their operations, resorting to hybrid managerial models. In this regard, the account operator scheme¹¹⁶ and the direct liquidity management¹¹⁷ are worth mentioning. These new operational models have introduced greater management flexibility, allowing participants to access settlement and administration services for financial instruments in a more tailored way.

Effects on business, on issuers' activities and on competition

Over the past six years, Monte Titoli has not recorded any major changes in market shares either in terms of settlement volumes or in terms of centralised value. However, the greater ease of access to foreign markets, brought about by T2S from a technological point of view and by the introduction of CSDR from a regulatory one, together with the harmonisation of the post-trading practices,

¹¹⁴ The removal of the matching fee and the gradual reduction in the custody fee.

¹¹⁵ The review process of internal fees was completed in January 2021 with the entry into force of a new fee structure that entails significant savings on Monte Titoli custody services.

¹¹⁶ In this scheme, the participant is the account holder but it delegates to a third party the management of the account itself.

¹¹⁷ In this case, the party holds a securities account with a custodian bank, while directly manages the liquidity through its own cash account in TARGET2.

have had a twofold positive effect. On the one hand, they have allowed Monte Titoli to expand its network of connections with other European depositories, succeeding in 2020 to manage € 260 billion in foreign securities – twice as much compared with the pre-T2S period. On the other hand, they have led to the acquisition of new customers, in particular some players of international level (the major custodians and some brokers).

This was also made possible by the integration of a complete and harmonised asset servicing feature with specific expertise in tax assistance. Now, these value added services are indeed the critical element in operators' assessment of the quality of the service for the choice of the reference depository. Monte Titoli offers an extremely standardised service, harmonised with European practices and characterised by high efficiency, answering to the needs of players with big volumes to manage.¹¹⁸

The introduction of T2S has resulted in an improved transparency of the fees applied by Monte Titoli, allowing participants to better compare the economic conditions and the services offered by CSDs. The greater ease of access to foreign markets, which has made the activity of the national CSD more contestable, has also increased competition with central depositories of other countries - virtually equivalent in terms of core services offered.

Last, with reference to the domestic issuers' activity, Monte Titoli does not report any relevant changes, as foreign players used to invest in Italy even before T2S (especially in sovereign bonds). However, the introduction of a single platform, combined with the harmonisation of market practices, has simplified the whole process. What has not changed with the advent of T2S is that large corporates continue to issue international bonds (Eurobonds) in the two European ICSD, despite the availability of a centralised European platform. In this regard, Monte Titoli considers it important that T2S may soon be able to offer international investors also the settlement of Eurobonds and supranational issuances.

An assessment of the dynamic effects

Monte Titoli considers the development of T2S as part of a wider effort, which aims to consolidate and make post-trading infrastructures in EU more efficient, supporting the creation of a single capital market.

Besides the forthcoming T2-T2S Consolidation in 2022 and the new ECMS platform for central banks' collateral management in 2023, Monte Titoli looks at the DIMCG¹¹⁹ initiative with great interest, especially to promote solutions

¹¹⁸ The fee mechanism adopted by Monte Titoli is based on the application of regressive fees by tiers and demonstrates the attention paid to large operators, such as custodian banks.

¹¹⁹ The [Debt Issuance Market Contact Group](#) (DIMCG) is an advisory group promoted by the Eurosystem. It comprises central banks as well as market operators involved in debt instruments issuance and their placement on the primary market. Its objectives are: i) to identify the factors that prevent efficiency and integration of debt instruments in the issuance area and in their distribution across the market from improving, starting from the pre-issuance phases through to the post-trading phase, and ii) to identify the solutions to remove them.

that would allow national CSDs to access supranational bond issuances, currently centralised in the ICSDs, as stated above.¹²⁰

Finally, the CSD highlighted that the synergy between ECMS and T2S will be able to fully unfold its positive effects, as T2S will be the single centralised platform for the settlement of collateral mobilised for Eurosystem credit operations, also allowing the quick mobilisation of the large volumes of these financial instruments.

5.2.2. THE EXPERIENCE OF INTESA SANPAOLO GROUP

Intesa Sanpaolo Group (ISP) is one of the leading banking groups in Europe. ISP sees itself as a solid and strategic partner for financial institutions in the Italian market and internationally, with a business policy based on a dedicated service approach organised by customer segment (banks, insurance companies, asset managers, financial sponsors, sovereign funds and governments). ISP offers integrated solutions based on the Group expertise in capital markets products, investment banking, commercial and transaction banking, through innovative and diversified customer services.

Intesa Sanpaolo's involvement in the T2S project and the investments made

In facing the launch of the T2S project, ISP Group made some strategic choices to enhance its custodian bank activities after having sold a specialized business branch, Fund Services, five years earlier.

The objective was to maintain a significant role as a provider of securities services, assisting an important foreign and domestic institutional clientele, characterised by a high concentration of investments in Italian securities but aiming at increasing their share of investments in foreign securities. With T2S, ISP intended to seize opportunities for business development by offering an integrated and efficient service, especially for those counterparties that wanted to entrust the management of their assets to a single bank able to offer broker/settlement agent/custodian services in an integrated way. Besides, T2S started operating in a rapidly changing market environment: several counterparties, characterised by complex and sophisticated operations, were asking for more flexibility and diversification of services.

In parallel, ISP wanted to define a strategy to safeguard and develop securities brokerage and trading activities within the Group (especially treasury and investment banking). For this reason, ISP chose to join T2S as a direct participant and planned to participate in the CSDs of the five most important markets in terms of managed assets: Italy, Germany, France, Belgium and Netherlands. For the other European markets in which it operates, ISP has opted instead for solutions that envisage the intermediation by other custodian banks.

The main objectives that guided ISP's "T2S Program" were:

- to review and optimise the services offered to customers, through direct participation in some CSDs or by entering into partnership agreements with the main market leaders;

¹²⁰ See Section 6.6.

- to ensure the offer of integrated custody services, identifying and evaluating commercial benefits, operational and risk management impacts;
- to rationalise costs, in terms of custody and administration fees, particularly for those markets where it operated indirectly;
- to bring the securities assets of all subsidiaries under the control of the Parent company to optimise/rationalise their activities.

This program was supported by a business plan that took into account the various investments required for the adaptation, installation and migration phases. ISP believes that the costs for the direct connection to T2S and direct accesses to CSDs were in line with its expectations, although significant and continuous over time.¹²¹

Thus, for ISP Group, T2S represented a key element in defining its securities services strategy. With T2S, ISP has also reviewed its organisational structure to ensure the proper management of the volumes traded by the Group itself and to grab the potential of the business.

Economic and operational benefits

In return for the investments made in view of the launch of T2S, ISP achieved the following economic benefits:

- significant savings due to the possibility of disintermediating agent banks in the four foreign markets where ISP opted for a direct participation;
- the increase in efficiency in internal processes, both from an application point of view and in terms of resources optimisation, with a special focus on optimising the liquidity used for settlement purposes;
- safeguarding of historical revenues and the possibility of increasing them by acquiring new customers thanks to a better and wider range of services.

The outlined strategy has put ISP in a position to fully compete at a regional and global level with major players, exploiting the asymmetries in the market and focusing on the segments of greatest interest. In this context, ISP has developed pricing schemes tailored for its institutional customers aimed at transferring the savings generated thanks to the “T2S Program”.

An assessment on issuers’ activity

ISP considers that T2S has had limited effects on issuers’ behaviour: they are usually intermediated by specialised agent banks that deal with the settlement of transactions on the primary market, that provide administrative support and that act as payment agents throughout the life cycle of the securities issued. Such agent banks also have specialist knowledge of the local market practices. It is commonly known this is one of the reasons why issuers continue to issue securities on an “intra CSD” basis, placing them in their respective markets also to be closer to their reference investors.

On the other hand, should issuers want to have access to a wider range of international investors, they usually opt to issue securities in the ICSD systems,

¹²¹ E.g., for new releases or change requests.

currently not participating in T2S, mainly for reasons related to practices and processes which are consolidated, well known, simple and efficient for all players involved in the securities issuance.

As part of the work to achieve the Capital Market Union, the ECB recently launched a survey about the functioning of the issuance industry in Europe, to detect whether there are structural barriers that hinder integration. ISP is actively participating in this exercise, especially at the DIMCG table set up in 2020, with the aim of designing a roadmap to address those barriers and the already identified frictional elements.¹²² The next step, of course, will be to define the convenience of the enhancements through a cost-benefit analysis.

An assessment on the dynamic effects

Since the launch of T2S, ISP, as a direct participant in several markets, has witnessed very different strategies and commercial behaviours among the various CSDs. Some have aimed at proposing themselves as a real new European hub; others have preferred to consolidate the local market or have extended the range of services offered.

Observing the banks' behaviours, ISP assumes that the introduction of the new settlement model has prompted many market operators to review their commercial offer, service models and the network of custodian banks. On the demand side, customers of custodian banks have initiated many tender procedures ("Requests for Proposal"), with the objective of consolidating, standardising and rationalising the offers of the various custodians and/or CSDs, to obtain "simplified" services on the European market. In many cases, this exercise has led to a real reorganisation of commercial relationships.¹²³ ISP, however, considers market dynamics as constantly evolving, also because operators continuously verify whether their initial choices and partnerships, implemented at the launch of T2S, are still valid with respect to their needs. Yet, ISP assesses that these changes are currently still quite rare, because of the costs and of the organisational commitments resulting from the reallocation of large asset portfolios from one bank to another or from one depository to another.

5.2.3. THE EXPERIENCE OF UNICREDIT GROUP

UniCredit is a multinational banking group operating in several European countries. For their treasury management, the Group is organised into the three Liquidity Reference Banks (LRBs) in Italy, Germany and Austria. Each LRB and every European bank belonging to the Group has an autonomous local treasury responsible for the banks/entities in its perimeter. Milan Group Treasury, in addition to being the Italian LRB, plays a role of guidance and control over all the other local treasuries of the Group. In this context, it operates to guarantee the financial stability and solvency of the Group, while ensuring the necessary operational efficiency and maximising the results of market risk management.

¹²² Such as, for instance: corporate laws, different legal systems and tax procedures, lack of common technological solutions and of an interoperable pan-European issuing model.

¹²³ With the start of T2S, ISP also reviewed contractual arrangements, service agreements and fees, based on the volumes of mandates and on service level agreements defined with their passive custodian banks.

UniCredit's involvement in the T2S project and the investments made

Through the Group Treasury, the bank proactively contributed to the T2S project, by participating in working groups coordinated by Banca d'Italia, the ECB and Monte Titoli. The internal treasury adaptation project concerned the direct management of their own securities portfolio, as the management of third-party securities was outsourced to an Italian custodian bank. The most appropriate T2S operational configuration to its business profile was then identified.

As a corporate group, Unicredit has worked to exploit the synergies offered by T2S that would allow the most efficient consolidated view of the cash accounts and configuration of securities accounts at the custodian bank for liquidity management purposes.¹²⁴ The new configuration made it possible to segregate and manage all Group's liquidity independently. Furthermore, unsecured credit lines and client collateralisation facilities in T2S were agreed with the custodian bank to facilitate the settlement of the Group's transactions during the operating day. Last, Unicredit routed all information regarding the monitoring of cash accounts coming from T2S and from the custodian bank to the internal treasury application.

In the management of UniCredit's own assets, joining T2S indirectly through Monte Titoli, while directly monitoring and managing cash, allowed them to reduce considerably project investments and to comply with the Group's treasury mission referred to in the preamble.

Economic and operational benefits

With the launch of T2S, market operators could use the new facilities provided by the platform, in terms of: i) synergies towards TARGET2; ii) segregation of the liquidity of UniCredit and its subsidiaries; iii) reduction of the demand for pre-funding during night-time settlement cycles; iv) efficient auto-collateralisation throughout the operating day. However, the existence of T2S has not actually changed UniCredit's configuration on the markets and the allocation of securities, including those used as collateral. In particular, the need to have more access to secured funding has required the maintenance of relationships with European depositories counting also those not participating in T2S. In fact, the lack of a real interoperability among collateralised markets represents the main constraint for a pan-European group like UniCredit.

Unicredit holds its own assets in three different depositories: the two ICSDs and the Italian depository, especially to ensure prompt access to central counterparties (CCPs) for collateral management. Today, UniCredit adheres to all main European CCPs and accesses central bank liquidity by allocating collateral held in the Italian CSD through T2S. Instead, securities used as collateral that are held in depositories not participating in T2S are mobilised through the CCBM channel. This diversification of access allows the Italian treasury to fully play its role of Parent Company for the group.

¹²⁴ For securities operations entrusted to the custodian bank, UniCredit opened a segregated DCA, available only to banks of the Group. This DCA was linked to UniCredit's TARGET2 account just as the DCA used by the bank to manage the cash side of their own securities portfolio.

Thanks to the competitive and catalyst role played by T2S for the whole industry, UniCredit was also able to negotiate with ICSDs new operational conditions to optimise liquidity and collateral usage.

Settlement in T2S has greatly reduced the number of failed transactions during the operating day. Above all, it had positive impacts on the costs of liquidity. Although they are not evident in the present context because of the excess of liquidity in Europe, in the first years of T2S, the new functionalities (e.g. auto-collateral) allowed to optimise the use of liquidity in the management of the bank's critical payments.

The operational configuration also made it possible to strengthen the monitoring of the bank's overall liquidity position, by comparing securities positions (with the intermediation of Monte Titoli) and cash position, aiming at reducing the difference between the expected and the actual position at the end of the day. This parameter is key to the UniCredit's treasury and allows to define the correct liquidity buffer to be held in the very short term.

An assessment on the dynamic effects

T2S, among other things, enables banks to centralise their own securities basket with a single central depository, gaining operational efficiency and achieving a general saving on operational costs: for instance, back-office management costs or those linked to the presence of a single pool of securities used as collateral to access the different markets. However, in UniCredit's view private market infrastructures are still not fully interoperable. The great effort made by T2S to break down many operational barriers that hindered the settlement was not followed by the necessary review of the arrangements and links between depositories to facilitate access to the different European markets.

The bank considers that the Single Collateral Management Rulebook for Europe (SCoRE),¹²⁵ with the ECB acting as coordinator of the harmonisation process of collateral settlement practices, will further facilitate this turnaround and, together with T2S, will be able to complete the financial markets integration, allowing the abundant liquidity available in Europe to be allocated more efficiently.

To this end, UniCredit believes that ECMS project will be strategic, if framed in the more general context of the harmonisation of collateral management. In particular, the possibility offered by ECMS to manage also non-marketable assets (single loans) will bring significant benefits to Italian banks.

Today, 75 per cent of collateral allocated by UniCredit to the pool account held with Banca d'Italia is made up of non-marketable assets, of which 30 per cent are bank loans. UniCredit will give great importance to this type of collateral in the future, boosting the role that banks can play in financing the real economy. Moreover, ECMS will also enable the Group to create synergies by monitoring collateral pools on a consolidated basis, achieving savings in terms of fees.

¹²⁵ See Advisory Group on Market Infrastructures for Securities and Collateral (2019).

6.

THE EVOLUTION OF T2S

6.1. THE CHANGE MANAGEMENT PROCESS: RELEASES AND CHANGE REQUESTS

The evolution of the platform is a continuous development process, aimed at improving and enhancing its services. As a technical platform shared by CSDs and central banks, the evolution of the functionality available to users takes place through a process involving various levels of interaction, defined in governance, between technical groups, steering groups and decision-making bodies;¹²⁶ this process allows all involved actors to take part in formulating proposals and managing features.

The evolution of T2S follows a year-long plan including three types of releases:

- a major release containing changes to the software on significant features, or that add new features, and possibly provide solutions to previously identified operating problems;
- a minor release which typically focuses on the regular alignment to ISO 20022 messaging standards, and possibly contains further minor changes compared to the major release;
- two bug-fixing releases, only if deemed necessary, relating to the resolution of specific operating problems identified in the time span following each major or minor release.

In the current plan the major release falls in June; the minor release in November and the other two possible releases in February and September.

Each release is based on change requests that may relate to interventions for the development of new functions, improvement of existing functions and alignment to regulatory or technical standards. Change requests can be raised both by the Eurosystem and by participants; they are discussed and evaluated on a regular basis in the technical groups that include representatives from all involved institutions. Each change request is assessed to determine its costs, priority and resulting assignment to a specific release; it is then approved by the T2S decision-making bodies.¹²⁷ Banca d'Italia participates in the process both as a user and as a service provider together with the 4CB.

Going into detail, a change request raised by a participant or by a central bank undergoes a multi-stage review and assessment process. Initially, the change request is discussed and possibly approved within the Change Review Group (CRG), focusing on perfecting the description of the change; subsequently the 4CB teams carry out an assessment of the technical solution and estimate the related costs, firstly by approximation and later on a more detailed level. The change request, along with the related assessment, is again brought to the CRG to decide whether to submit it to the approval process required by T2S governance.

¹²⁶ See Chapter 2.

¹²⁷ CSD Steering Group (CSG) and Market Infrastructure Board (MIB); see Chapter 2.

In addition to the CRG, this process involves the CSD Steering Group (CSG) and the Non-Euro Currencies Steering Group (NECSG), which receive, respectively, the requests of the CSDs and non-euro central banks participating in T2S. These groups then make their own recommendations and, in turn, submit the change requests to the Market Infrastructure Board (MIB). Based on the proposals received, the MIB decides whether to authorize each change request.

If it is approved, the Project Managers Group (PMG) includes the change request in the list of possible changes to be included in a given software release. In doing this, the PMG takes into account the priority levels assigned by the CRG to change requests and by the Operations Management Group (OMG) to operating problems detected in T2S.

Once the individual changes have been approved, the implementation phase begins, aiming to provide the updated features for the various test phases: initially at the level of internal 4CB acceptance, and subsequently for user tests and external acceptance by the participants. Once these phases have been passed, the functional changes are released into the production environment.

The following Sections illustrate the main evolution areas that will affect T2S in the near future. Among these, the ongoing T2-T2S Consolidation project, part of the medium-to-long term evolutionary vision of Eurosystem market infrastructures, is mentioned in Annex A.5.

6.2. T2S AND SETTLEMENT DISCIPLINE: THE PENALTY CALCULATION MECHANISM FOR CSDs

One of the most important functional changes being implemented entails the development of a component for the platform to centrally calculate penalties for CSDs' customer banks that fail to settle securities. This is a new feature that further expands the scope of services offered by T2S to CSDs in view of the entry into force of the European settlement discipline Regulation, scheduled for February 2022.

SETTLEMENT DISCIPLINE

European Commission Delegated Regulation (EU) 2018/1229, supplementing Regulation (EU) no. 909/2014 with regard to regulatory standards (CSD Regulation) imposes a number of measures collectively labelled “settlement discipline”.

Its provisions can be grouped into:

- 1. Measures to reduce the occurrence of settlement fails, which include process automation, obligations to report possible manual interventions, making certain message fields mandatory when matching settlement instructions and other specific functions;*
- 2. The obligation for CSDs to monitor and communicate data on settlement fails and on settlement efficiency to the relevant authorities, including studying measures to improve the degree of efficiency;*
- 3. The imposition of monetary penalties on users who cause settlement fails;*
- 4. A compulsory purchase procedure for instruments subject to settlement fail.*

Provisions related to the penalty regime have been implemented in a regulatory framework by the European CSD Association (ECSDA).

Within T2S governance it was agreed to develop a centralized mechanism for calculating penalties as an additional service provided by the Eurosystem to CSDs. Like the settlement function T2S offers, the calculation of penalties represents a technical function outsourced by the CSDs to the shared platform. This centralized solution has a number of advantages compared to a scenario with proprietary calculation mechanisms under each individual CSD, such as better integration with the T2S database and settlement functions, consistency in calculation criteria for all CSDs and the consequent reduction of uncertainty and potential disputes between participants; furthermore, the central nature of the T2S service and its pricing model make it advantageous for CSDs to join, compared to the costs of developing and maintaining individual independent systems.

The T2S penalty mechanism will calculate, on a daily basis and for each concluded settlement date, monetary penalties for settlement and matching fail events based on the intended settlement date. Penalties will be charged to individual participants who will be informed through reports during the day when the calculation takes place. The penalty amount will be calculated using the individual financial instruments' reference prices provided by the issuer CSDs together with discount rates defined per type of instrument.

An appeal period, set until the tenth working day of the month following the calculation of the penalty, allows to request the correction or update of an already calculated penalty, for example in the event of a change to the underlying data or technical responsibility of the CSD in the settlement fail.

T2S will communicate to the participants involved the net amount of the penalties to be paid or collected by means of a monthly report produced on the fifteenth working day of the month; the related positions must be settled within two working days. The mechanism does not cover the collection and automatic redistribution of penalties; these processes will be performed by the CSDs on the basis of the monthly data provided by T2S.¹²⁸

6.3. PARTICIPATION OF THE FINNISH CSD (THE “DIRECT-HOLDING” MODEL)

On 30 October 2019, Euroclear Finland announced their intention, in agreement with the ECB, to participate in T2S by September 2023.¹²⁹ This constitutes a significant development because of the volumes of data and instructions it will entail, given that the Finnish market offers securities accounts at the national CSD not just to institutions but also directly to individuals (the so-called direct participation model or “direct-holding market”). Euroclear Finland manages around 7,000 instruments as issuer CSD and 1.5 million securities accounts; the latter figure is approximately ten times the current number of accounts present in T2S. The migration of such a large amount of data to T2S, together with the expected volume of transactions, requires an in-depth test campaign on the

¹²⁸ Settlement discipline imposes that CSDs using a common settlement infrastructure should follow harmonised procedures.

¹²⁹ See Euroclear Finland (2020).

platform, which could highlight the need for application and infrastructural adaptations to avoid adverse effects on performance.

Euroclear Finland will be the fourth CSD in T2S to offer direct participation, joining VP Securities (Denmark), Nasdaq CSD (Baltic countries) and NCDCP-CSD (Slovakia).

6.4. T2S AND COLLATERAL MOBILISATION FOR EUROSISTEM CREDIT OPERATIONS

Banks access Eurosystem credit¹³⁰ by providing adequate collateral made up of eligible assets.¹³¹ Such collateral is managed through technical platforms owned by central banks (Collateral Management Systems, CMSs). Collateral mobilisation takes place in different ways¹³² between the banks' accounts and those of the central banks granting credit, held with the respective CSDs. These transactions are then settled both in T2S, for the depositories who joined it, and in the private systems belonging to the two ICSDs that are not participating in the platform.

At present, collateral management for Eurosystem credit operations is carried out through 19 national CMSs, although defined within a harmonised framework. From November 2023, the single platform Eurosystem Collateral Management System (ECMS) will replace the national CMSs,¹³³ adopting procedures and technical standards that will be the same for operators, financial intermediaries and central banks in all countries of the Euro area.

ECMS will complete the TARGET services offer, interacting directly with T2S and T2, and will use the common data services of the ESCB.¹³⁴

In view of the launch of ECMS, the Eurosystem is working to complete the harmonisation of market practices regarding securities transactions, part of which had already been harmonised for the settlement in T2S.¹³⁵

Furthermore, to make the operational processes of collateral management more efficient, the provision of collateral for credit operations to NCBs will

¹³⁰ Monetary policy operations for financing and intraday credit for settlement of payments within the TARGET2 system.

¹³¹ [ESCB Statute](#), art. 18.

¹³² Domestic transfers between accounts held with the same depository; cross-border transfers using eligible links between different depositories' accounts or through correspondent accounts between central banks, should an eligible link not be available using the Correspondent Central Banking Model (CCBM). Alternatively, hybrid mobilization channels (CCBM with links) can be used or mobilization may also be outsourced to a third subject (triparty agent).

¹³³ ECMS is part of the portfolio of initiatives developed by the 4CB; its development and operational management is entrusted to Banque de France and Banco de Espana.

¹³⁴ Eurosystem supplies common data flows for collateral management, e.g. those related to eligible assets (Counterparty and Collateral Database/Eligible Assets – C2D/EA), to the prices of collateralized securities (Common Eurosystem Pricing Hub – CEPH), to counterparties qualified for credit operations and their close links (Register of Institutions and Assets Database – RIAD).

¹³⁵ This was in the scope of the Eurosystem Collateral Management Harmonisation task force, in which representatives of all Eurosystem NCBs participate, and the [Collateral Management Harmonisation task force](#), in which market players (central depositories, global custodians and the most important banks) also participate.

be centralised in T2S from the start of the ECMS,¹³⁶ which will thus be able to communicate with a single settlement platform. The harmonisation in Europe of market practices related to collateral, as well as the future settlement in T2S of all securities mobilised as collateral for Eurosystem credit operations, may bring synergies to the entire post-trading industry, as well as favour the entry of new players¹³⁷ in T2S.

6.5. THE CHALLENGE OF NEW TECHNOLOGIES AND THE OPPORTUNITIES OFFERED BY AN EVOLVING WORLD

New technologies for securities settlement

The potential impacts of innovative technologies in cash and securities settlement are being examined at global level. Systems based on distributed ledger technology (DLT)¹³⁸ would allow, for example, to represent securities in the form of digital tokens¹³⁹ with important effects in terms of costs, efficiency and risk. The potential applications of such a technology represent a prospective challenge for centralized systems such as T2S, but they also offer the opportunity to create synergies in the post-trading landscape.

PROJECT STELLA AND OTHER DLT STUDIES

Project Stella, a collaboration between the ECB and the Bank of Japan, focuses on the possibility of using DLT in the context of market infrastructures. The first Stella report¹⁴⁰ (September 2017) remarked on the relative immaturity of the technology, deeming it unsuitable for large-scale payment solutions such as TARGET2 or the Japanese RTGS BOJ-NET. The second phase focused on securities settlement, with the March 2018 report¹⁴¹ describing the theoretical possibility of executing DvP transactions in a DLT context. The Stella project looked at technical and conceptual aspects, with a certain level of practical experimentation using existing DLT systems. In particular, the project highlighted the possibility of making data from different systems interact even without direct connections between them; this would make it possible, for example, to carry out DvP by combining information from a securities settlement system and a separate cash settlement system, or to transfer securities between different settlement systems. This would allow to use independent systems, each

¹³⁶ See European Central Bank (2021a).

¹³⁷ Euroclear, international securities depository for Eurobonds, announced in November 2019 its intention to join T2S. See Euroclear Bank (2019).

¹³⁸ The term “distributed ledger technology” identifies different types of systems architecturally based on a distributed set of “nodes”, each of which replicates all or part of the information present on the others, with consensus and synchronization mechanisms that ensure the correctness of the information in each point.

¹³⁹ Tokenisation is a process by which securities (newly issued or already existing in dematerialized form) are represented as digital tokens, typically within a DLT system. A token is a sequence of code containing all the information needed for the unique identification of the security itself and its ownership. It differs from the dematerialized form, which is also a digital representation of value, in at least two aspects: the method of verifying transfers, which is not in the hands of a CSD but depends on the validation of the token itself according to the rules of the underlying DLT system; the degree of information centralisation along with the rules for its modification, also not concentrated in a single entity (again, a CSD) but open to multiple participants of the same DLT network depending on the system.

¹⁴⁰ See European Central Bank (2017b).

¹⁴¹ See European Central Bank (2018a).

with specific characteristics that adapt to different requirements, while maintaining high levels of overall efficiency. However, the report concludes by emphasizing the need for further in-depth analysis; the implementation of such a system would be highly complex and could pose problems concerning, for example, settlement speed and liquidity requirements.

Theoretically, the use of a DLT infrastructure with securities in the form of tokens would allow information on the ownership of securities and transactions to be more widely distributed, reducing the costs of confirming exchanges between participants. In this sense, the possibility offered by DLT to define smart contracts, i.e. instructions to be executed automatically upon the occurrence of certain conditions (for example, the payment of interest or dividends to the holders of securities), is relevant. This feature would allow high levels of automation, simplifying the settlement chain.

According to the March 2020 BIS report,¹⁴² the use of DLT in securities settlement has the potential consequence of reducing the number of intermediaries. While this could on the one hand lead to improvements in terms of efficiency, it would still have a disruptive effect on the current market structure in a direction that is not necessarily desirable, given the role of intermediaries themselves in facilitating transactions, especially in stress situations.

Furthermore, the technology is not without its risks. The BIS report underlines that tokenisation would lead to shortening the length of settlement cycles, and consequently the substitution risk, but would require more liquidity from market participants. Finally, an increase in legal and operational risks can be anticipated, at least in the short term, and particularly if we consider a progressive adoption in which centralized systems and DLT will inevitably coexist. Depending on the type of system, a certain degree of counterparty risk – which has been overcome with the use of integrated systems such as T2S – may emerge once more.

In addition to theoretical studies, there are already numerous real-world applications of DLT in the context of market infrastructures, albeit experimental and on a generally limited scale. In particular, two separate projects experimented with the interconnection of prototypes for the settlement of tokenised securities with cash settlement systems based on the issuance of central bank digital currency (CBDC): the Ubin project,¹⁴³ of the Monetary Authority of Singapore in cooperation with the Singapore Stock Exchange, and the Swiss central bank's Helvetia Project¹⁴⁴ in cooperation with the national CSD SIX-SIS and the BIS itself. The Ubin project highlighted the advantages of the prototype in terms of efficiency and simplification of procedures and also made it possible to collect a first set of needs for legal and organizational safeguards to ensure the proper functioning of such a system; Project Helvetia, which also included an alternative prototype interfaced with the national RTGS system, highlighted the feasibility of both solutions and the greater potential of the one based on CBDC (in terms of functions such as instant DvP regulation) but also the additional doubts in legal and supervisory areas.

An area for potential synergy is the securities issuing function, as exemplified for example in the 2019 Société Générale issue of tokenised bonds¹⁴⁵ on the Ethereum blockchain network, which demonstrated the feasibility of meeting legal and regulatory requirements through this method. Similarly, the Commonwealth Bank of Australia, in cooperation with the World Bank,¹⁴⁶ issued tokenised securities maintained and settled on a DLT network.

¹⁴² See Bank for International Settlements (2020).

¹⁴³ See Deloitte, Monetary Authority of Singapore, Singapore Stock Exchange (2018).

¹⁴⁴ See Bank for International Settlements, SIX Group AG, Swiss Central Bank (2020).

¹⁴⁵ See Société Générale (2019).

¹⁴⁶ See World Bank (2019).

The potential applications of this technology deserve further investigation, but there are already several real-world implementations, although at an experimental stage, which display important opportunities. The most disruptive aspect in some ways is represented by the flexibility of the technology, with its applicability to different areas, as well as by the short time apparently required to make new application prototypes technically ready to be used on the market; these aspects suggest that major large-scale innovations could potentially be close. In this sense, the ability of DLT solutions to interface with existing centralized systems will be critical.

At a systemic level, the net effects of the adoption of this technology still appear uncertain and to be demonstrated. Legal and operational implications are among the aspects still under analysis. Furthermore, the new solutions are numerous and mostly at the prototype stage and no single solution seems to be emerging as the prevailing one. It is therefore difficult to imagine that a new technology based on distributed systems and digital tokens will quickly take over the domain of more traditional technologies, which market operators on a global scale still rely on. In the medium term, T2S's integrated and centralised solution will continue to constitute a secure, versatile and reliable instrument for securities settlement. Although based on "traditional" technology, T2S offers advanced and optimized functions that market operators have helped to define; moreover, it is based on a solid legal framework and on a robust control and supervision system shared at European level. The integration of cash and securities and the joint presence of central banks and CSDs on the platform ensure high levels of reliability and efficiency, while minimizing risks and liquidity needs on a European scale.

The opportunities offered by the European Commission's new issuance program for Next Generation EU

The effects of the spread of the COVID-19 pandemic and the huge support programs funded by European and world authorities will have an impact on markets in the years to come, with inevitable consequences for the financial industry.

In Europe, the 2020 agreement between the European Commission, the European Parliament and the Heads of State and Government of the Union on the "Recovery Plan for Europe", called NextGenerationEU (NGEU)¹⁴⁷ set the

THE EVOLUTION OF T2S

Adapting T2S to the new regulatory directives will further contribute to harmonising settlement practices, while integration with the ECMS platform for collateral management in Eurosystem credit operations is under way; furthermore, the participation of the Finnish CSD will represent a new milestone in terms of traffic volumes. The emergence of technologies such as distributed ledgers presents a challenge to T2S in maintaining its role in the securities settlement landscape.

¹⁴⁷ The agreement provides for non-repayable transfers and loans to EU countries for a total amount of 750 billion euros between 2021 and 2026.

basis for a multi-year plan for the issuance of Commission bonds in euro to be launched, leading to a structural change in the sovereign bond market. To finance the NGEU program, the Commission will issue bonds in euro across the entire maturity curve between 2021 and 2026 and possibly beyond.¹⁴⁸ The Commission's issues will be highly liquid and in terms of size and coverage of the curve they could become benchmarks for the European sovereign bond market and be used by financial operators to determine returns.¹⁴⁹

The supranational issuance plan highlights the need for a mechanism to allow the participation of all the main institutional investors – European and international – and at the same time the distribution of these securities throughout the European market; to settle their purchase on accounts held with central banks, exempt from credit risk, rather than in commercial bank money, also in consideration of the high amounts. In the absence of this distribution mechanism, up to now bond issues from European supranational organizations¹⁵⁰ have been centralized in the two ICSDs, Clearstream Banking Luxembourg and Euroclear Bank, which do not participate in T2S.¹⁵¹

The centralisation of new issues at ICSDs would strengthen their market position compared to other CSDs with regard to supranational securities, in contradiction with the Commission's own objective of achieving full integration of the financial market in Europe, allowing equal opportunities for intermediaries. Furthermore, it would involve the assumption of a high credit risk by the issuer, as a result of the settlement of transactions in commercial bank money rather than in central bank money.

The ICSDs' participation in T2S could be the solution to allow the transfer of securities between all CSD participants after the issue: in fact, one of the founding principles of T2S is in fact to make securities issued by a participating CSD available for settlement. The entry of ICSDs into T2S, however, would require long technical adaptations and would be hardly compatible with the Commission's issuing requirements.

An alternative solution could be to establish, with the support of the Eurosystem, a system for the distribution of supranational issues involving the CSDs in T2S, each of which would centralise a part of the issue. In fact, the Eurosystem platform possesses the required security features and offers services to the entire European market; it is also the only one that allows settlement on accounts in central bank money in a wide range of markets.¹⁵²

¹⁴⁸ The program's funding includes the possibility to extend loans until 2058.

¹⁴⁹ A security's return is determined on the market, by using as reference that of an extremely liquid security from an issuer considered to have zero risk of failure (benchmark) and adding a premium for liquidity risk and one for default risk.

¹⁵⁰ European Commission, European Investment Bank (EIB), European Stability Mechanism (ESM).

¹⁵¹ Since 2020, the two ICSD have issued bonds to finance the SURE program (Support to mitigate Unemployment Risks in an Emergency) – up to 100 billion euros in favourable term loans.

¹⁵² The analysis of this solution, started by the Eurosystem in 2018-19, has been put on hold following a public consultation. See European Central Bank (2019).

The European Commission's issuance program, in addition to affecting the capital market and potentially being a factor for change in the equilibrium of the post-trading industry, represents an opportunity to be seized for the Eurosystem and for the European market to strengthen the network effects of the platform and the business of the operators who use it.

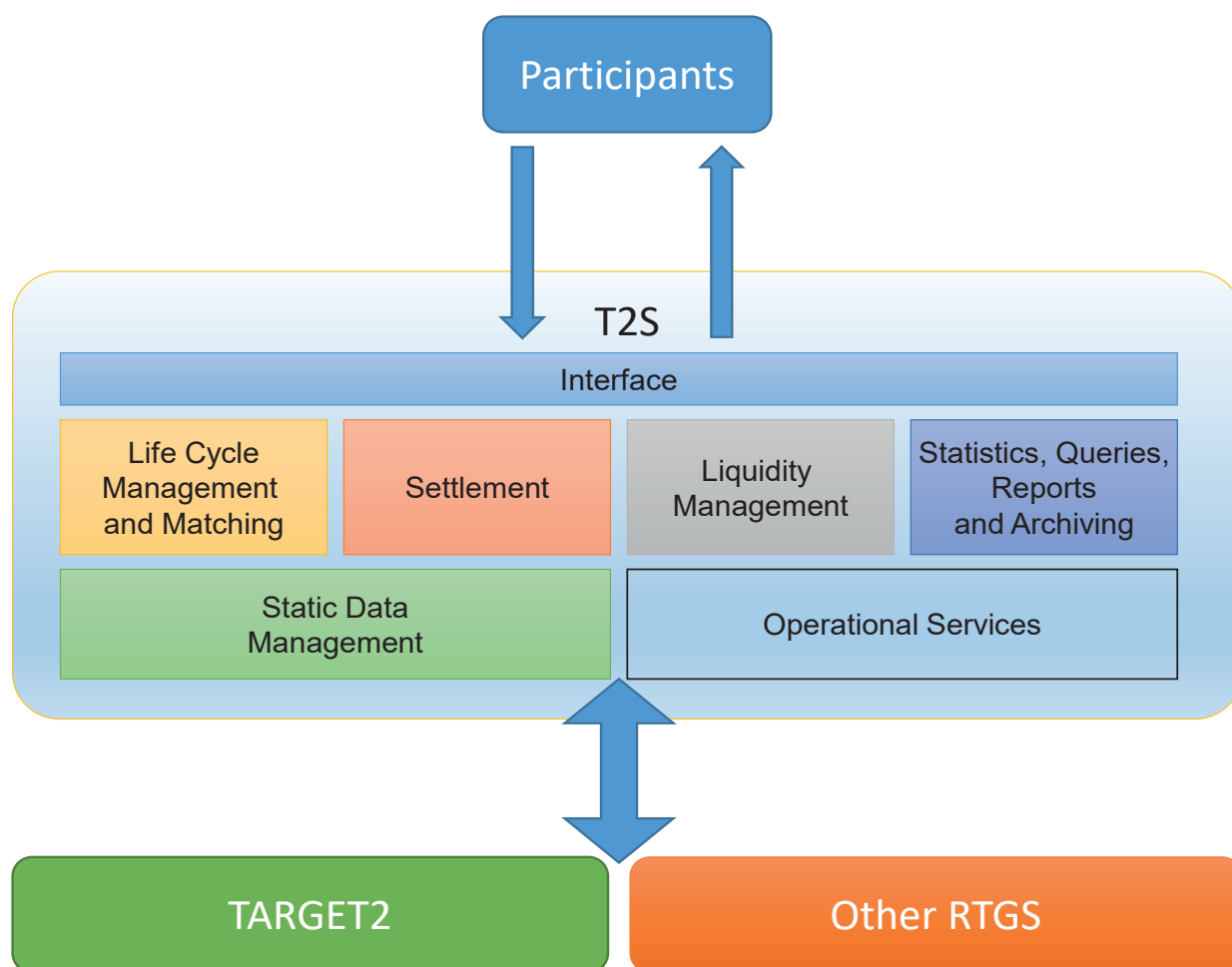
ANNEX

A.1: FUNCTIONAL STRUCTURE OF T2S

This Section describes the main aspects of the T2S functional design, which is made up of seven application macro-components called “domains”, each of which covers different functions (Fig. 8).

Figure 8 - Functional domains of T2S and their interactions with the outside world

(participants, cash settlement systems)



All incoming and outgoing communications are processed by the Interface domain, which represents the access point to the platform. Communications can take place via messages generated in application-to-application (A2A) mode or user interactions in user-to-application (U2A) mode via the T2S graphical user interface. Communications through the A2A channel, in line with the recommendations of the first Giovannini report, adopt a standard market protocol (ISO 20022). Incoming communications, depending on their nature (for example settlement instructions, data maintenance or liquidity transfer instructions), are then forwarded to the various internal domains.

The securities and cash settlement instructions are managed by the Life Cycle Management and Matching (LCMM) and Settlement domains. The former manages the validation and matching of settlement instructions and offers features for the modification and cancellation of previously sent instructions and for the calculation of penalties for settlement fails.¹⁵³ The latter carries out the actual settlement operations, debiting and crediting the related securities and cash accounts, according to the DvP method offered by T2S;¹⁵⁴ it also employs optimization tools made possible by the coexistence of securities and cash accounts on the same platform, which allow to achieve higher levels of efficiency than those of an interfaced securities settlement system,¹⁵⁵ which does not integrate the cash leg.

T2S also offers liquidity management functions to manage the dedicated cash accounts on the platform. All the euro liquidity present in T2S, which enables the settlement of securities transactions to take place, is transferred from TARGET2 on a daily basis; at the end of each business day, all liquidity is automatically returned to the accounts opened in TARGET2 or, for non-euro central banks, to the originating payment system. This mechanism allows TARGET2, for example, to verify compliance with the reserve obligation. Based on the participants' instructions, the liquidity required for settlement is then transferred to T2S at the opening of the following business day.¹⁵⁶

T2S also provides Static Data management functions to manage the information stored in the system, in particular on participating actors and available securities, as well as data configurations to support other system functions. Finally, there are features for Statistics, Queries, Reports and Archiving which allow data analysis, synchronous or asynchronous communication¹⁵⁷ of specific information and data archiving for legal purposes, as well as Operational Services for the operational monitoring of the system, billing, data migration and management of the operating day.

The box: *The life cycle of a settlement instruction in T2S* shows how the listed functions interact in the processing of a generic settlement instruction.

THE LIFE CYCLE OF A SETTLEMENT INSTRUCTION IN T2S

The following diagram shows the various stages a settlement instruction goes through from entering the system to the moment of final settlement (Fig. A).

¹⁵³ The T2S penalty mechanism is described in Chapter 6.

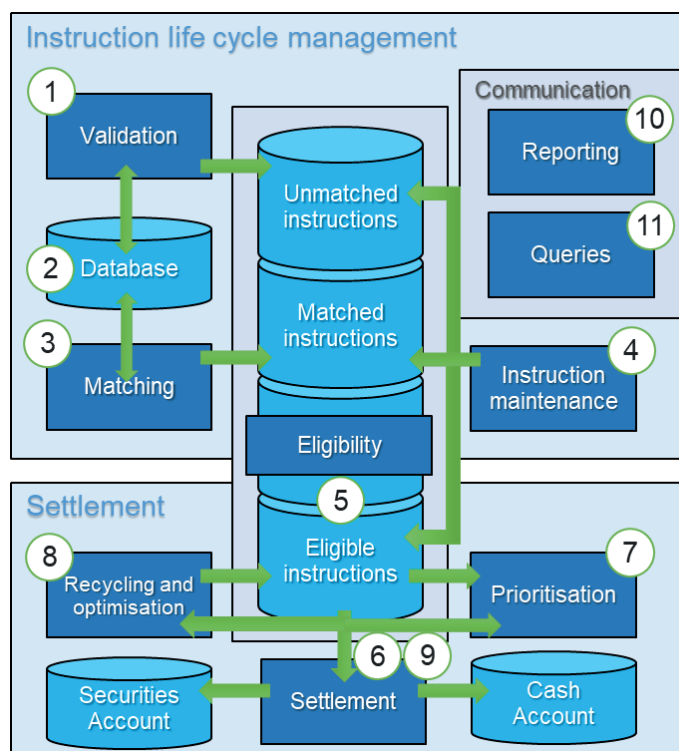
¹⁵⁴ For a description of DvP settlement see Section 1.2.1.

¹⁵⁵ See Annex A6: Securities post-trading.

¹⁵⁶ Among the innovations introduced by the T2-T2S Consolidation project, T2S participants will be able to hold liquidity on their euro dedicated cash accounts at the end of the day. Liquidity in T2S will be taken into consideration for reserve obligation and marginal lending requirements, thus offering more flexibility to users and simplifying end-of-day procedures.

¹⁵⁷ Synchronous communication uses query functions where the user can check the status of the system and of specific data in real time; asynchronous communication centers on the generation and sending of reports at pre-defined points in time according to user configuration.

Figure A - The life cycle of a T2S instruction



1. The participant sends a settlement instruction to T2S that validates its content according to the system rules.
2. Internal validations also take into account the underlying data, for example the existence of the specified securities and cash accounts. In the event of validation errors, the instruction is rejected and its processing ends: the participant must correct the error and submit a new instruction to the system.
3. Following a positive validation, the instruction is subjected to matching attempts: the system looks for another mirror instruction, entered by the participant defined as the counterparty in the transaction, which confirms its details.
4. If necessary, in the event of input errors or changes in the agreed conditions, the instructions can be modified or canceled by the participants.
5. Once the intended settlement date has been reached, the matched instructions are subject to checks on settlement eligibility, based on any restrictions on the accounts involved and on the validity of the financial instrument being exchanged; in the event of a positive outcome, the instructions are forwarded to the settlement component.
6. During the day-time phase, eligible instructions are subjected in real time to a first attempt at simultaneous settlement of the securities and cash legs (DvP).
7. If settlement fails, for example due to lack of securities or necessary cash on the accounts, the instructions are organized according to priority levels defined by participants and CSDs.
8. The settlement of an instruction during the daytime phase and the consequent modification of the related securities and cash positions causes the "recycling" of unsettled instructions, which are submitted to a new settlement attempt during the subsequent night-time phase. In this phase instructions are aggregated according to the following optimization tools in order to maximize the chance of successful settlement:

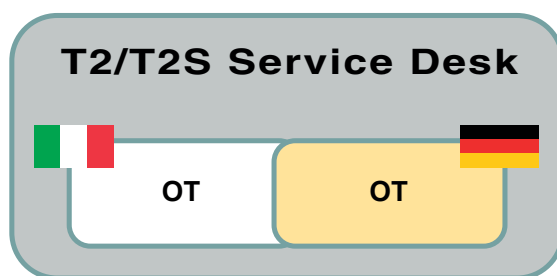
- a. *Technical clearing mechanisms that calculate multilateral net positions resulting from the simultaneous settlement of multiple instructions, limiting the total amount of securities and cash required and maximising settlement probability;*
 - b. *Prioritisation of instructions based on the preferences expressed by participants and CSDs (see point 7);*
 - c. *Possibility of partial settlement, under certain conditions, to regulate instructions for part of the amount of securities and / or cash instructed;*
 - d. *Auto-collateralisation¹⁵⁸ mechanism, which allows the automatic provision of intraday credit by central and commercial banks where there is not enough cash to settle a transaction, in addition to the automatic release and replacement of collateral to cover the lack of required securities.*
9. *Recycled instructions are submitted to additional settlement attempts during the subsequent night-time phase. If an instruction fails to settle, a new attempt is made in the day-time phase of the following business day, and so on. Unsettled instructions are kept in the recycling process for a set period of time (20 business days for unmatched instructions, 60 for matched instructions). At the end of the period, if the instructions have not yet been settled, they are deleted from the system.*

Some of these steps (for example, the instruction settlement) produce communications to the users.

A.2: SUPPORT FOR OPERATIONS ON EUROSISTEM MARKET PLATFORMS: THE SERVICE DESK

The Service Desk is made up of two Operational teams (OT; Fig. 9) working simultaneously (active-active mode) in Italy and Germany and offering support to the TARGET2 and T2S operator community. Staff is available in both regions according to the “two regions one team” principle and offers the same support. In the event that one of the two teams cannot perform their duties, for example due to the unreachability of the monitoring systems, the other is able to take over in a manner that is transparent for the users of the platform.

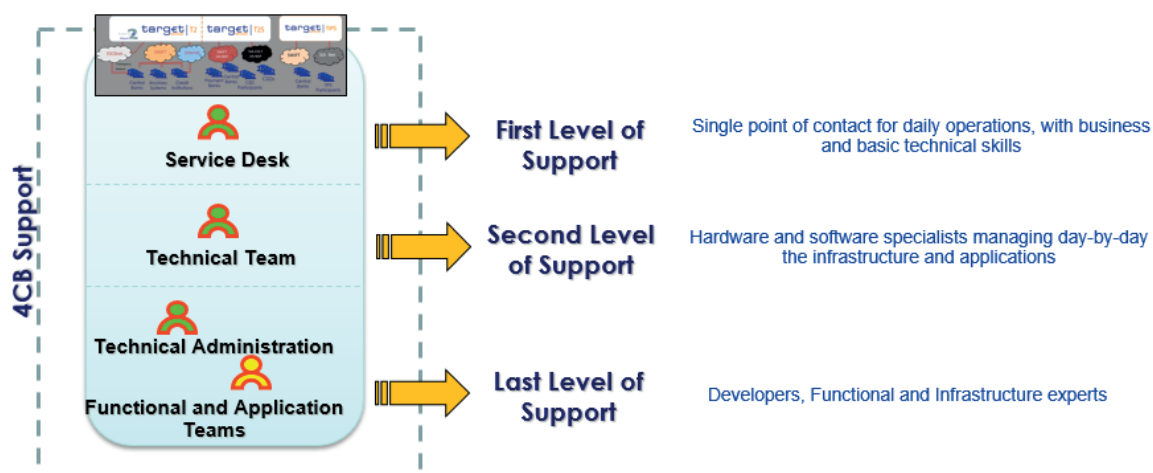
Figure 9 - The organisation of the TARGET2 / T2S Service Desk



The service offered by the Service Desk relies on the contribution of the second and third levels of support in cases where specialist skills are required to solve a problem (Fig. 10):

¹⁵⁸ For a description of the technical auto-collateralisation method, see Section 1.2.1.

Figure 10 - The three levels of support offered by the Service Desk to market operators



The Service Desk monitors and supervises the daily operations of the provided services; it gives support to central banks and central depositories (and commercial banks only for requests related to connectivity); it manages incidents and restores operations in the event of interruptions.

Monitoring and supervision of the services' daily operations

Monitoring activities consist in identifying any technical problems that may prevent the correct settlement of transactions as well as any problems related to the business operations carried out by the participants. It takes place through the use of sophisticated computer systems that allow to supervise the platform through a complex network of alarms even outside of support hours.¹⁵⁹

Among the most important operational tasks is monitoring the progress of the operating day, in which the different phases of the settlement process take place (see the box: *T2S operating day*, Chapter 1).

Direct support to central banks and central securities depositories (CSDs)

This type of support is provided to manage requests for clarification and to identify the causes of problems occurring on the data entered¹⁶⁰ or on the procedures to be followed.¹⁶¹ In the event of T2S connection problems, support can also be extended to commercial banks and CSD participants. Support requests are sent using multiple communication channels: email, telephone, fax.

Incident management and restoring full operation in the event of outages

The term "incident" refers to an event that can cause an interruption or reduction in the quality of the services provided by the platforms. The purpose

¹⁵⁹ Support is usually provided from Monday to Friday from 6:30 am to 8:00 pm. Outside of these hours, specialists are activated on an on-call basis through automatic calls issued by the monitoring system.

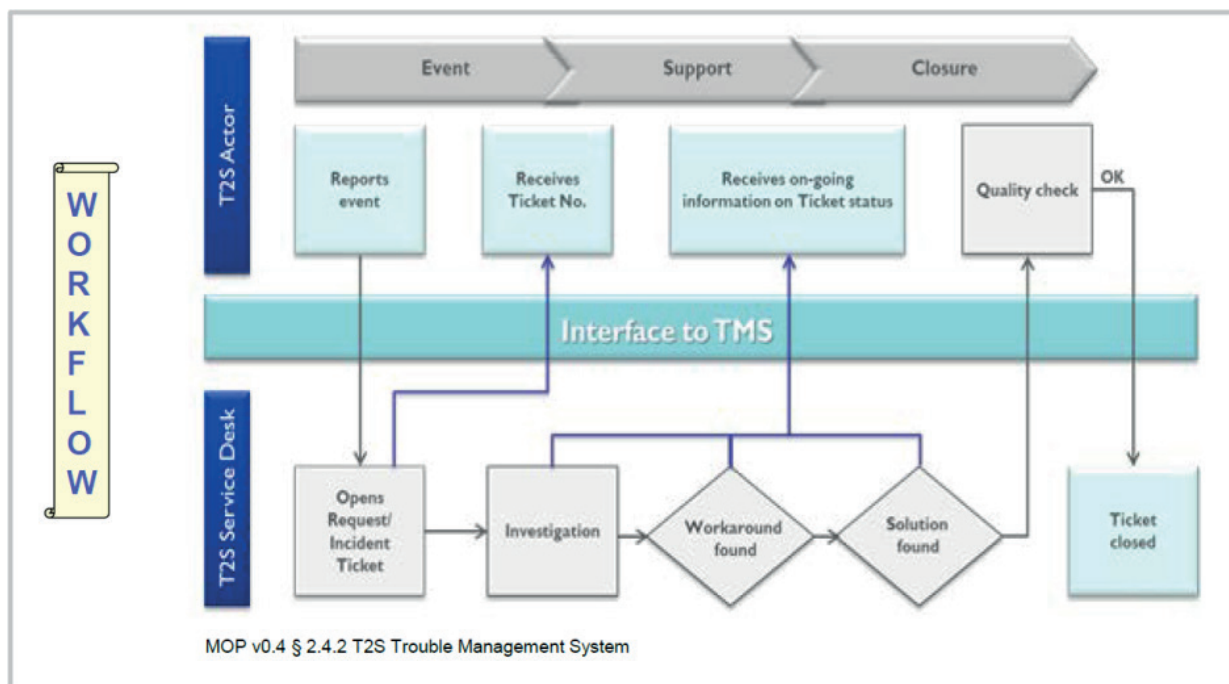
¹⁶⁰ For example, on settlement, maintenance, reporting instructions, etc.

¹⁶¹ The procedures for operating on the TARGET2 and T2S platforms are summarised in a document (Manual of Procedure - MOP).

of the incident management process is to restore normal operation of the service as quickly as possible and minimize negative impact on the business of counterparties¹⁶² in the event of an incident, thus ensuring the agreed quality levels are respected.

Incident management consists in (Fig. 11):

Figure 11 - The incident management process



1. Identification: the problem can be identified by the market, external suppliers, Service Desk or by tools for automatic monitoring.
2. Tracking, categorisation and prioritisation: the Service Desk takes care of recording all the detailed information relating to the incident through a computer application and assigns a priority to the event based on the resulting impact.
3. Assignment to the competent support groups, in charge of the subsequent phases.
4. Problem analysis: the cause of the malfunction is identified.
5. Resolution and recovery: the support teams verify the possibility of applying a temporary solution to ensure the immediate recovery of operations; otherwise they may suggest the activation of operational procedures defined in the manual of procedures approved by the market. The final solution may be provided at a later stage if it requires a more in-depth analysis. Since the contractually defined KPIs define maximum response times, the Service Desk role is crucial in the management of

¹⁶² For TARGET2 the counterparties are central banks and their related financial communities while T2S also includes CSDs and related participants.

problematic events, in the correct application of the agreed procedures, in the initiation of remedial actions and in the communication with the Eurosystem. The performance of the platform is therefore not only a matter of technical availability, but also of organizational and human aspects that the Service Provider must know how to activate, as evidenced also by the existence of specific management KPIs, such as response and resolution times.

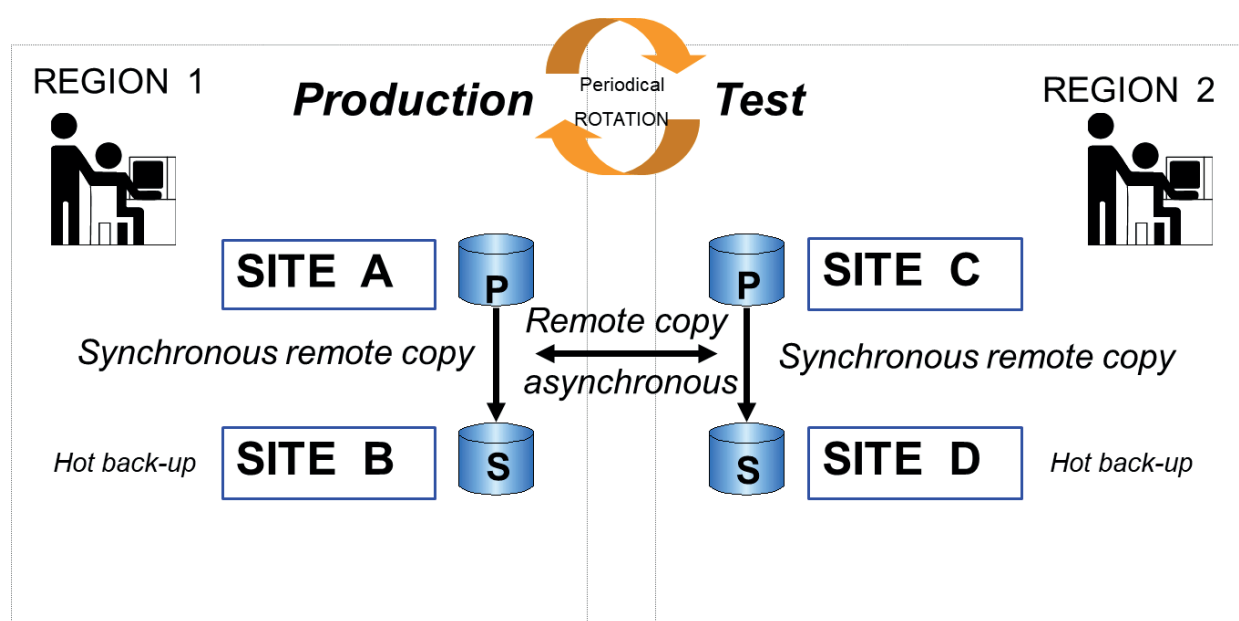
A.3: BUSINESS CONTINUITY

The 4CB apply Business Continuity Management (BCM) principles with the aim of reducing the likelihood of a service interruption caused by adverse events of varying magnitude. The operational continuity plan in place for T2S (also common to TARGET2) defines the measures necessary to ensure that the processes can restart within predetermined and contractually agreed times. As of writing, T2S has never had to resort to the activation of these measures, which are in any case regularly verified with the involvement of the participants.

The application of BCM principles in T2S has led to the adoption of a technological infrastructure distributed over two “regions” (located in Italy and Germany) each of which consists in two sites, primary and secondary, synchronized with each other (Fig. 12). Periodically, once a year, a rotation is carried out to shift the provision of the service to the primary site of the other region; this is to guarantee the same technological and infrastructural levels in Germany and Italy and to maintain alignment in the technical skills of the staff who manage the systems.

The alignment of the database between the two regions takes place every two minutes through an asynchronous copy of the information.

Figure 12 - The two regions and four sites infrastructure that hosts TARGET2 and T2S



The business continuity guaranteed by this infrastructural redundancy is measured through the definition of two parameters:

1. Recovery Time Objective (RTO): identifies the maximum time allowed for the recovery of the service;
2. Recovery Point Objective (RPO): defined as the maximum amount of data that can be lost after a recovery from a disaster, failure, or comparable event. It is measured in terms of an acceptable span of time to lose exchanged messages.¹⁶³

The procedures and recovery times established by the service agreements with the market (Service Level Agreement, SLA) are different depending on the problem that has occurred; in particular, if the problem:

1. does not cause significant impacts and can be resolved directly at the primary site (Short Continuity Failure) RTO and RPO must be zero;
2. causes a “serious” outage, which requires the activation of the secondary site (Major Failure), RTO must be less than or equal to 60 minutes and RPO still equal to zero, a value guaranteed by the synchronization between sites in the same region;
3. causes both sites to become unavailable (Regional Disaster), requiring the activation of the secondary region, RTO can reach a maximum of two hours and RPO a maximum of two minutes. In these cases it is essential that there is full recovery of lost messages through the RAD (Restart After Disaster) operating procedure described in the T2S operations manual.

A.4: THE SUPPORT TO THE ITALIAN FINANCIAL COMMUNITY: THE NATIONAL SERVICE DESK

Banca d'Italia, through the National Service Desk, offers support to financial institutions of the Italian community that operate on the Eurosystem market platforms and, thus, hold cash accounts at the central bank.

Banks participating in T2S, depending on the type of accounts they hold, can rely on the support of the relevant central securities depository (CSD) for the management of their securities accounts (SAC) and of the national central bank (NCB) of reference for the management of their cash accounts (DCA). As already noted, CSDs and NCBs are responsible for support and business relations with participants.

For operational and market support functions, each CSD and each NCB appoints one or more managers responsible for the settlement process (Settlement Manager). The Settlement Managers of the NCBs, jointly with the ECB's coordination function for the TARGET services, monitor the performance of the Eurosystem market infrastructures and support banks in managing liquidity within them. For this reason, the support to DCA holders (so-called payment banks) is usually offered, at each NCB, by a structure responsible for all TARGET services. Moreover, incidents with an impact on cash accounts are

¹⁶³ Users are aware that in this circumstance two minutes of messages can be lost: thanks to the Restart After Recovery (RAD) procedure which the operators take part in, the lost messages can be subsequently recovered.

managed following the procedures set out by the RTGS system of reference (TARGET2 for Italy and the rest of the euro area).

In particular, Banca d'Italia provides banks operating in Italy with:

- administrative support in terms of contracts, maintenance of personal data and technical configurations of participants (static data) as well as the data necessary for the management of the auto-collateralisation;
- monitoring of settlement activities and liquidity flows in the system;
- management of incidents originating both in the platform components and at the level of individual participants.

Generally, support to the banking community is offered through the preparation of subscription contracts (participation contracts to join T2S as payment bank are annexed to the participation contract in TARGET2), the registration and technical configuration of the participants in the system. In addition, the banking community is regularly updated on the smooth running of the T2S operating day and of the "critical" liquidity flows to and from TARGET2.

Payment banks can be classified as Directly Connected Participant (DCP) or Indirectly Connected Participant (ICP), depending on whether they technically interact directly or indirectly (through their CSD or BCN) with the platform. In both cases, they can contact the National Service Desk at Banca d'Italia for information and assistance. Only DCPs can access the platform's European Service Desk directly and merely for connection issues. The National Service Desk normally guarantees support from 6.30 am to 7.30 pm of each TARGET2 / T2S operating day.

If a bank participating in T2S is unable to operate for technical reasons, it can resort to the so-called acting on behalf, i.e. the National Service Desk can carry out transactions on behalf of the bank involved (for example, liquidity transfers).

In the event of incidents involving the entire platform, the dedicated incident management process is activated (see Annex A.2). In this case, the actors directly involved – the 4CB, the ECB, the CSDs and the central banks – join forces to decide on the actions to be implemented for a prompt resolution of the incident.

Even on these occasions, however, it may be necessary to provide support to participants: firstly, with a timely (and agreed upon with the ECB) communication of any impacts on participants of the ongoing incident; secondly, by indicating any corrective actions that the participants themselves, or the central banks on their behalf, need to take.

A.5: FUNCTIONAL INTEGRATION OF SECURITIES AND CASH SETTLEMENT: T2-T2S CONSOLIDATION

With the launch of T2S in production in June 2015, the Eurosystem geared its strategic planning towards the development of a medium-to-long term evolutionary vision for its market infrastructures. Between 2015 and 2016, a task force of representatives from the Eurosystem's central banks analyzed

possible areas of intervention with the aim to integrate existing services, modernise the infrastructure and develop new services.

The ensuing proposals, grouped under the name Vision 2020, resulted in three new projects with specific plans and organisational structures: the development of a pan-European instant payments system (achieved with the TARGET Instant Payments Settlement (TIPS) service in November 2018), the consolidation of the TARGET2 and TARGET2-Securities systems (T2-T2S Consolidation, under development) and the creation of a centralised collateral management system (Eurosystem Collateral Management System, ECMS, also under development).

On 6 December 2017, the Governing Council of the ECB approved the launch of the T2-T2S Consolidation project, which thus formally entered the implementation phase, with the 4CB in the role of service provider. The rationale behind the project involves exploiting the more modern technological solutions introduced by T2S to achieve functional, technical and infrastructural synergies with TARGET2 and to develop new application components geared towards flexibility and integration of settlement services.

Reusing the infrastructural and application components developed in T2S, with the necessary adaptations, represents an important harmonisation factor both at the technical design level and from the point of view of the end user; at its core is the idea of providing common features, where possible, for all TARGET services (T2, T2S and TIPS, with some designed to also support ECMS), with consequent benefits in terms of efficiency and interoperability between systems.

This will make it possible for the future TARGET2 (renamed T2) to adopt certain advanced features introduced in T2S, some strongly requested by users, including support for the ISO 20022 messaging standard and, in the future, settlement in currencies other than euro (in addition to the Danish kroner). In turn, T2S will undergo adjustments to interact with the shared components that will simplify interactions with other services, for example in the area of liquidity management processes.

The T2-T2S Consolidation project plans to integrate TARGET2 and T2S by adopting the modern infrastructural and connectivity solutions present in T2S, as well as to develop:

- a more advanced gross settlement system, with a dedicated tool for the centralised management of liquidity (Central Liquidity Management or CLM) in the various TARGET services (which will include the new TARGET2 – under the name of T2 –, T2S, TIPS and the ECMS platform for the management of collateral);
- common components, both newly developed and based on the enhancement of application modules already existing in T2S.

The introduction of CLM as a central tool for liquidity management will allow to achieve a greater level of automation, for example in the area of minimum reserve calculation procedures, which will consider the balances present on accounts in the various services without the need to transfer all the liquidity to one place.

The following list summarises the main characteristics of the common components, in addition to their links with the functions already implemented in T2S.

- A Common Reference Data Management Component (CRDM), entirely based on the current T2S static data management domain, which will allow to define in a single point the data configurations needed to use the various services' features, reducing information duplications where possible thanks to the definition of data both shared between the various services, such as the participants themselves, and specific to individual services, such as the settlement accounts; it will also manage the data needed for the operation of the other common components.
- A single interface for access management (Eurosystem Market Infrastructure Gateway, ESMIG) based on a new technical infrastructure, which will allow users to reach the services they wish from a single access point through their chosen network service provider. Following the connectivity model introduced by T2S,¹⁶⁴ ESMIG will allow participants to select their network service provider among those licensed by Banca d'Italia on behalf of the Eurosystem, thus encouraging competition through the extension of this principle also to the new T2.
- A central component for managing the services' calendars and operating days (Business Day Management, BDM), entirely based on the current equivalent module in T2S, allowing to view and manage information relating to the status of T2 and T2S in a single point.
- A common Billing component, which will allow to optimize processes related to collecting billing data and issuing the relevant invoices for all TARGET services.
- A new Legal Archiving common component, which will handle the conservation of data and messages exchanged between services and users for legal purposes.
- A new Data Warehouse common component, which will offer reporting on operational information from the different services and components for statistical analysis purposes.
- A new contingency settlement component (Enhanced Contingency Solution II or ECONS II), which will offer cash settlement facilities in situations where the normal T2 functions are temporarily unavailable.

The introduction of common components will enable higher levels of efficiency and procedural optimization. For example, the costs connected to the management of different reference data systems (which may also contain repeated data) will be reduced or eliminated; the need to maintain different access channels to the platforms will be removed, with less contractual burden for users; similarly, the use of a single invoicing component for all services will reduce the operational costs of the Eurosystem in this respect.

If on the one hand the centralization of these functions into common components introduces potential risks in the form of dependencies (the unavailability of a single shared component can have repercussions on several services) the

¹⁶⁴ See the box: *Connectivity in T2S*, Chapter 4.

intermittent nature of the interactions between the components allows to minimize its impact. For example, the new T2 real-time gross settlement system will continue to update its internal data repository on a daily basis, as the current TARGET2 does: once the data loading is completed, T2 will operate independently from CRDM using its internal database. In the specific case of the future ESMIG interface common to all platforms, on the other hand, the technical solution is based on dedicated access points per service: therefore, the possible unavailability of the T2S access channel, for example, will have no repercussions on T2 nor on any other services.

Finally, the introduction of common components introduces a further level of complexity in the evolutionary management of individual services: each change request raised within a service that has impacts on a shared component is in fact also assessed within all other potentially involved services. In the case of T2S, the presence of common components required to enrich the governance principles defined in contracts with CSDs and with non-euro central banks with specific agreements defined between the parties.

Some of these components have already been made available in order to allow the go-live of TIPS.¹⁶⁵ T2S will adapt to all the new features in June 2022, before the production go-live of the new T2, expected to take place in November of the same year.

A.6: SECURITIES POST-TRADING

When two counterparties enter into a securities trade,¹⁶⁶ the delivery of the securities to the buyer usually takes place simultaneously with a cash exchange.¹⁶⁷ This phase – known as post-trading – includes the clearing and the possible netting of securities and cash, followed by the settlement on securities and cash accounts of the seller and the buyer. These activities are carried out by specialised operators, collectively referred to as the ‘post-trading industry’.

During the clearing phase, counterparties generate and transmit, usually through electronic networks, the instructions for the exchange of securities (so-called securities leg) and related cash counterpart (so-called cash leg) to an operator who deals with the clearing. Both the seller and the buyer send their instructions, which must be matching (matching phase). In this phase the netting of purchase and selling orders may also occur, to determine the final settlement positions.

During the settlement phase, the transfer of securities and that of the related cash takes place through booking entries in the counterparties’ accounts. The mutual obligations are extinguished and the settlement is considered final from the moment its effects are no longer revocable in the event, for instance, of a legal dispute or default of one of the counterparties. Settlement is said to be

¹⁶⁵ See Renzetti *et al.* (2021).

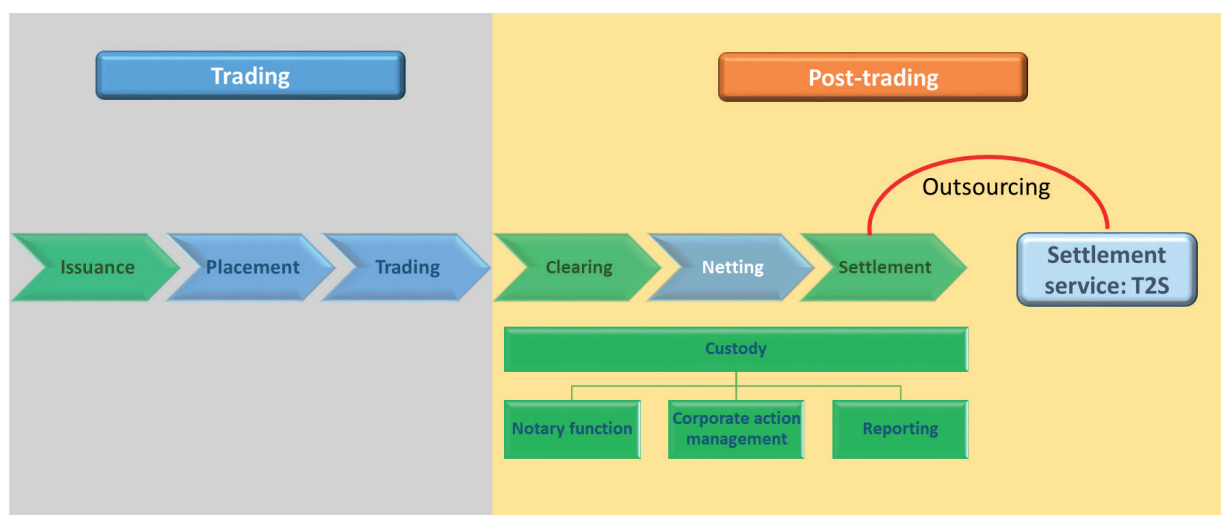
¹⁶⁶ This phase also includes the subscription and placement of a security at the time of its issuance.

¹⁶⁷ In addition to this modality, known as delivery versus payment or DvP, the exchange may take place without a cash payment (free of payment or FOP).

domestic if the counterparties operate in the same country where it happens or cross-border in case they operate in one or more different countries.

Fig. 13 shows the phases of a securities transaction.

Figure 13 - The phases of a securities transaction



● CSD activities

Central securities depositories (CSDs)¹⁶⁸ play a unique role among the post-trading industry operators. Their main activities are securities issuance and custody, the reconciliation of the total amount of securities issued and allocated to holders' accounts (notary function), the management of events related to the life cycle of securities (asset servicing or corporate actions management), the reporting to the securities accounts' holders;¹⁶⁹ furthermore, CSDs offers settlement services for financial instruments.

To carry out the tasks relating to the clearing and settlement phases of transactions, each CSD operates a Securities Settlement System (SSS), a technological platform where transfer orders are executed through booking entries on securities accounts of the counterparties or their intermediaries.¹⁷⁰ Settlement of the cash leg of securities transactions can take place between accounts held by operators in the central bank (central bank money settlement) or between accounts held

¹⁶⁸ Other players of the sector are custodian banks and central counterparties.

¹⁶⁹ These core activities are often complemented by the offer of ancillary or value added services to customers, such as, for instance, securities loan, triparty services for collateral management, tax services, advisory services for issuers and investors. Furthermore, CSDs are subject to oversight by competent authorities because of the criticality of the tasks performed for the financial system. In the Italian legal system, the Testo Unico sulla Finanza – TUF (Consolidated Law on Finance) confers to Banca d'Italia and Consob (Italian authority for listed corporates and exchange) regulatory, authorisation and supervisory powers over CSDs.

¹⁷⁰ Financial operators, who are not direct customers of a central securities depository, operate through intermediaries (custodian banks) that hold an account with the given depository. Intermediaries that have accounts in several central securities depositories, thus operating in the markets of many countries, are called global custodians.

in a commercial bank (commercial bank money settlement). SSSs can settle securities and cash on the same platform – so-called integrated model – or on distinct platforms (interfaced model). CSDs can outsource the settlement service for securities transactions, as is the case of CSDs participating in T2S, where settlement takes place in an integrated way, in central bank money.

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Glossary

4CB	Banque de France, Banca d'Italia, Deutsche Bundesbank, Banco de España.
A2A (Application-to-Application)	Interaction between IT applications (typical interaction method between computers that generally cooperate among themselves via a data communication network).
BCM (Business Continuity Management)	The principles and procedures for the analysis, prevention and mitigation of risks that can lead to an interruption of business processes, regardless of their cause (e.g., natural events or related to IT service failure).
CLM (Central Liquidity Management)	Dedicated tool in the new T2 service for the centralised management of liquidity and the settlement of central bank operations.
CPMI (Committee on Payments and Market Infrastructure)	The Committee on Payments and Market Infrastructures (CPMI) is an international standard setter that promotes, monitors and makes recommendations about the safety and efficiency of payments, clearing, settlement and related arrangements, thereby supporting financial stability and the wider economy. It is composed of representatives coming from 25 central banks and reports to the central bank Governors in the BIS Global Economy Meeting (GEM).
CRDM (Common Reference Data Management)	Common component developed by the Eurosystem in order to maximize the synergies between TARGET2 and TARGET2-Securities and facilitate the consolidation of the technical, application and infrastructural components of TARGET services. The CRDM component provides features to setup, maintain and query all reference data used by the different Eurosystem Market Infrastructure (EMI) services.
ECMS (Eurosystem Collateral Management System)	A unified system for managing assets used as collateral in Eurosystem credit operations (refinancing operations and intraday credit).
ESCB (European System of Central Banks)	It consists of the European Central Bank and the national central banks of all member states of the European Union. It was established by the Maastricht Treaty in 1992, which defined its objectives: (i) to maintain price stability, as a priority objective, and (ii) to support the EU economic policies in order to improve employment opportunities, without prejudice to the objective of price stability.
ESMIG (Eurosystem Single Market Infrastructure Gateway)	Common component developed by the Eurosystem in order to maximize the synergies between TARGET2 and TARGET2-Securities and facilitate the consolidation of the technical, application and infrastructural components of TARGET services. The ESMIG component provides a set of features shared among all the market infrastructure services beyond representing a single point of contact with the external networks.
Eurosystem	The Eurosystem comprises the ECB and the NCBs of those countries that have adopted the euro. It is responsible for conducting the single monetary policy.
ICSD (International CSD)	Central securities depositories settling trades in international securities: Euroclear Bank, Clearstream Banking Luxembourg.

Iosco (International Organization of Securities Commissions)	International body that brings together the world's securities regulators; it is the global standard setter for the securities sector and promotes markets' adherence to internationally recognized standards for securities regulation. It works with the G20 and the Financial Stability Board (FSB) on the global regulatory reform agenda.
ISO 20022 (standard)	International standard based on XML (Extensible Markup Language) messages for electronic data interchange between financial institutions.
MIB (Market Infrastructure Board)	The governance body that supports the Governing Council of the European Central Bank by ensuring the development, management and evolution of the Eurosystem's market infrastructures. The MIB acts in accordance with: (i) the objectives defined by the Treaty on the Functioning of the European Union and the Statute of the European System of Central Banks and of the European Central Bank; (ii) operational needs and technological advances; (iii) the legal framework applicable to Eurosystem services and projects, as well as legal and oversight requirements, in full compliance with the mandate of the ESCB committees. The MIB reports directly to the decision-making bodies of the ECB.
RTGS (Real-Time Gross Settlement)	A settlement system where payment orders are settled individually and in real time, provided that there are sufficient funds or credit available on the originator bank's account.
T2	The new RTGS system developed by the Eurosystem, which includes the CLM component. It will replace TARGET2 as part of the T2-T2S Consolidation.
T2S SAC (securities accounts)	Securities accounts opened by banks with the CSDs in T2S.
TARGET (Services)	Market payment services, developed and managed by the Eurosystem, which guarantee the free exchange of cash, securities and collateral across Europe. They include TARGET2 (for the settlement of large euro interbank payments and monetary policy operations), T2S (for the settlement of securities transactions) and TIPS (for the settlement of instant payments). All services settle in central bank money.
TARGET2	Real Time Gross Settlement system that represents the evolution of TARGET, developed with the aim of meeting the needs arising from the growing financial integration within the euro area. The related technical infrastructure was built by the central banks of France, Germany and Italy; Banca d'Italia and the Deutsche Bundesbank are also responsible for operating the system. TARGET2 consists of a Single Shared Platform (SSP) that offers a harmonized service with a uniform tariff scheme. Although based on a single infrastructure, TARGET2 is legally structured as a multiplicity of payment systems consisting of all the component systems of TARGET2, designated as "systems" according to the respective national regulations implementing the settlement finality directive. TARGET2 was launched on November 19, 2007 and became fully operational on May 19, 2008, with the conclusion of the migration phase.
TARGET2-Securities (T2S)	The technical platform – owned by the Eurosystem – for the settlement of securities transactions in central bank money. For each transaction, domestic and cross-border, the money and securities change hands simultaneously. The development of the platform was entrusted to the central banks of France, Germany, Italy and Spain (4CB). Banca d'Italia and the Deutsche Bundesbank are also responsible for operating the system.

TARGET2-Securities (T2S) DCA	Cash account opened by a bank in T2S to settle the cash leg of securities transactions. The TARGET2 Guideline disciplines T2S DCAs.
TIPS (<i>TARGET Instant Payment Settlement</i>)	Pan-European platform for real-time settlement of instant payments (payment instructions settled within a few seconds from their submission) on a 24-hour basis, 365 days a year.
U2A (<i>User-to-Application</i>)	Method of interaction between physical users and an IT application.

