



EUROPEAN CENTRAL BANK  
EUROSYSTEM

# TARGET Annual Report

2018

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# Introduction

Market infrastructures constitute one of the three core components of the financial system, together with markets and institutions. The market infrastructure for payments<sup>1</sup> consists of the set of instruments, networks, rules, procedures and institutions that ensure the circulation of money. Its purpose is to facilitate transactions between economic agents and support efficient resource allocation in the economy.

The Eurosystem has the statutory task of promoting the smooth operation of payment systems. This is crucial for a sound currency, the conduct of monetary policy, market functioning, and financial stability. A key instrument which the Eurosystem uses for carrying out this task<sup>2</sup> is the provision of payment settlement facilities. To this end, the Eurosystem operates the second-generation Trans-European Automated Real-time Gross settlement Express Transfer system<sup>3</sup> (TARGET2) for the euro.

In May 2008 TARGET2 replaced the first-generation system, TARGET, which was created in 1999 by the Eurosystem for the settlement of large-value payments in euro, offering a central bank payment service across national borders in the European Union (EU).

TARGET was developed to meet three main objectives:

1. to provide a safe and reliable mechanism for the settlement of euro payments on a real-time gross settlement (RTGS) basis;
2. to increase the efficiency of inter-Member State payments within the euro area; and, most importantly,
3. to serve the needs of the monetary policy of the Eurosystem.

Like its predecessor, TARGET2 is used to settle payments connected with monetary policy operations, as well as interbank payments, customer payments exchanged between banks and transactions related to other payment and securities settlement systems, i.e. ancillary systems. As TARGET2 provides intraday finality, i.e. settlement is final for the receiving participant once the funds have been credited, it is possible to reuse these funds several times a day. Since June 2015 TARGET2 participants have also been able to open dedicated cash accounts (DCAs) on the TARGET2-Securities

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<sup>1</sup> A payment is defined as the process by which cash, deposit claims or other monetary instruments are transferred between economic agents.

<sup>2</sup> The Eurosystem fulfils this task by:

- providing payment and securities settlement facilities (TARGET2 and TARGET2-Securities (T2S)) as well as a mechanism for the cross-border use of collateral (the correspondent central banking model (CCBM));
- overseeing the euro payment and settlement systems;
- setting standards for the use of securities clearing and settlement systems;
- acting as a catalyst for change (e.g. promoting the SEPA initiative).

<sup>3</sup> A real-time gross settlement (RTGS) system is a payment system in which processing and settlement take place in real time (i.e. continuously), rather than in batch-processing mode. It enables transactions to be settled with immediate finality. Gross settlement means that each transfer is settled individually, rather than on a net basis. TARGET and its successor TARGET2 are both RTGS systems.

(T2S) platform,<sup>4</sup> which they can use to settle the cash leg of their securities transactions. Moreover, as of November 2018, TARGET2 participants can use TIPS, a new service implemented by the Eurosystem for settling euro-denominated instant payments on an individual basis and around the clock.

Building on the synergies between the two market infrastructures, the Eurosystem has started to consolidate TARGET2 and T2S services. This will allow it to enhance its RTGS services, further strengthen cyber resilience and establish a single access point to a range of market infrastructure services.

TARGET2 offers harmonised services at the EU level and a single pricing structure. It provides ancillary systems with a harmonised set of cash settlement services and supports its users with enhanced liquidity management tools. In this manner, it contributes to financial integration, financial stability and liquidity efficiency in the euro area.

TARGET2 is accessible to a large number of participants. Over 1,700 credit institutions in Europe use TARGET2 to make payments on their own behalf, on behalf of other (indirect) participants or on their customers' behalf. Taking into account branches and subsidiaries, almost 50,000 banks worldwide (and thus all of the customers of these banks) can be reached via TARGET2.

## The report and its structure

This report is the 19th edition of the TARGET Annual Report. The first edition was published in 2001, covering TARGET's two first years of operation (1999 and 2000). As in previous years, the report provides information on TARGET2 traffic, its performance and the main developments that took place in 2018. It is addressed mainly to decision-makers, practitioners, lawyers and academics who need an in-depth understanding of TARGET2. We hope it will also appeal to students with an interest in market infrastructure issues and TARGET2 in particular.

In addition to the core content, the report includes six boxes on topics of particular relevance in 2018 and an in-depth analysis of a specific TARGET2 feature. The boxes focus, respectively, on the evolution of traffic in TARGET2; intraday TARGET2 liquidity and its usage; the implications of Brexit for TARGET2; ASI 6 Real-Time and TIPS activities; new enhanced contingency services; the TARGET2/T2S consolidation project and future RTGS services. In the report, the references made to the first-generation TARGET system (which was in operation from January 1999 to May 2008) are also applicable to its second generation, TARGET2 (which replaced TARGET in May 2008).

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<sup>4</sup> For further information, see <http://www.ecb.europa.eu/paym/t2s/html/index.en.html>.

## Note

*Please note that liquidity transfers between TARGET2 and T2S/ TIPS DCAs and payments processed on T2S/TIPS DCAs were not included when calculating the TARGET2 indicators presented in this report.*

*Despite the fact that both T2S and TIPS DCAs are legally part of TARGET2, these (technical) transactions are excluded from the calculations in order to prevent the system's indicators being artificially inflated and to make the figures more easily comparable from year to year. Nevertheless, as a matter of transparency, some general (cash-based) and per-country statistics on T2S DCAs are provided on the ECB website.<sup>5</sup>*

## TARGET2 activity

In 2018 TARGET2 maintained its leading position in Europe, processing 90% of the total value settled by large-value payment systems in euro, and in the world as one of the biggest payment systems. Compared with the previous year, the total turnover processed remained stable, amounting to €432.5 trillion.<sup>6</sup> The total volume of payments fell slightly, by less than 1%, at 88.5 million transactions.

The highest daily turnover during the year was recorded on 28 September, with a total value of €2,409 billion, and the highest daily payments volume was recorded on 3 April, when 591,010 transactions were processed.

The availability of TARGET2's Single Shared Platform (SSP) in 2018 stood at 99.98%.

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<sup>5</sup> See [Monthly statistics of payment instructions processed by TARGET and EURO1/STEP1](#).

<sup>6</sup> Together with the payments processed on T2S DCAs, the overall turnover in 2018 reached almost €524 trillion, corresponding to a daily average of €2.3 trillion. The detailed figures can be found on the ECB website: [Value of transactions per month processed by TARGET and selected interbank funds transfer systems](#).

# 1 Evolution of TARGET2 traffic

**Table 1**  
Evolution of TARGET2 traffic

| TARGET2 overall      | Value (EUR billions) |         |            | Volume (number of transactions) |            |            |
|----------------------|----------------------|---------|------------|---------------------------------|------------|------------|
|                      | 2017                 | 2018    | Change (%) | 2017                            | 2018       | Change (%) |
| <b>Total</b>         | 432,781              | 432,508 | -0.1%      | 89,276,944                      | 88,442,641 | -0.9%      |
| <b>Daily average</b> | 1,697                | 1,696   |            | 350,106                         | 346,834    |            |

Note: There were 255 operating days in both 2017 and 2018.

## 1.1 TARGET2 turnover

TARGET2 turnover in 2018 amounted to a total value of €432.5 trillion, corresponding to a daily average of €1.7 trillion. Chart 1 shows the evolution of TARGET2 traffic over the last eight years. In 2011 and 2012, TARGET2 settlement volumes continued to recover after the slump caused by the financial crisis, with an annual growth rate range of around 3%. The observed drop in 2013, by 22%, was due mainly to a change in the statistical methodology. This involved some transactions ceasing to be included in the aggregate representing the turnover.<sup>7</sup> Overall, after two years of stable figures, TARGET2 turnover on RTGS accounts fell by almost 15% between 2015 and 2017, following the launch of T2S.<sup>8</sup> In 2018 the TARGET2 value stabilised and remained at almost the same level as in the previous year.

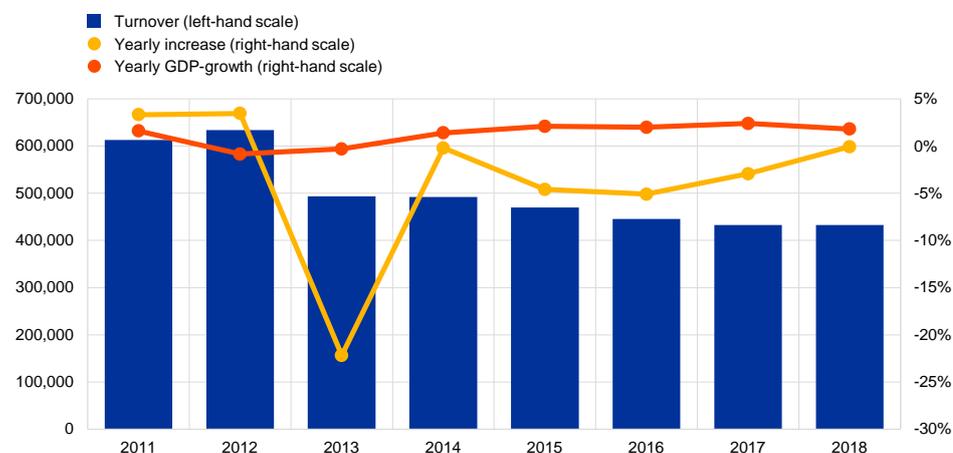
<sup>7</sup> See the box entitled “Changes to the statistical framework of TARGET2”, *TARGET Annual Report 2013*, ECB, May 2014.

<sup>8</sup> As a consequence of the migration of the central securities depositories (CSDs) to T2S, final securities settlement of the cash leg of securities transactions is no longer carried out on the RTGS accounts of their participants in TARGET2. Instead, it takes place via the DCAs held in T2S.

## Chart 1

### TARGET2 turnover

(left-hand scale: EUR billions; right-hand scale: percentage)



In terms of activities involving market participants (i.e. excluding central bank and ancillary system transactions), exactly as in 2017, interbank transactions (transactions exclusively involving credit institutions) accounted for 78% of the total value of the payments in 2018, whereas the remaining share was composed of customer transactions (i.e. transactions processed on behalf of a non-bank party, be it an individual or a corporate). Compared with the previous year, the value of customer payments increased by 7% and the value of interbank payments was lower by 1%.

A comparison of the TARGET2 turnover and the euro area's annual GDP (around €11 trillion) shows that TARGET2 settles the equivalent of the annual GDP in less than seven days of operations. This indicates the role and efficiency of TARGET2, which provides intraday finality for transactions and allows the funds credited to the participant's account to become immediately available for other payments. Consequently, the same euro can be reused several times by several TARGET2 participants within the same day.

Chart 2 depicts the average daily turnover generated in TARGET2 for each month in 2017 and 2018, thus showing the seasonal pattern of the system. While the general pattern for both years is very similar, the values recorded in May 2018 are visibly lower than in the same period of 2017. The difference is largely attributable to the higher number of various national holidays that affected market activity in May 2018, as compared with May 2017.

## Chart 2

### Average daily TARGET2 turnover

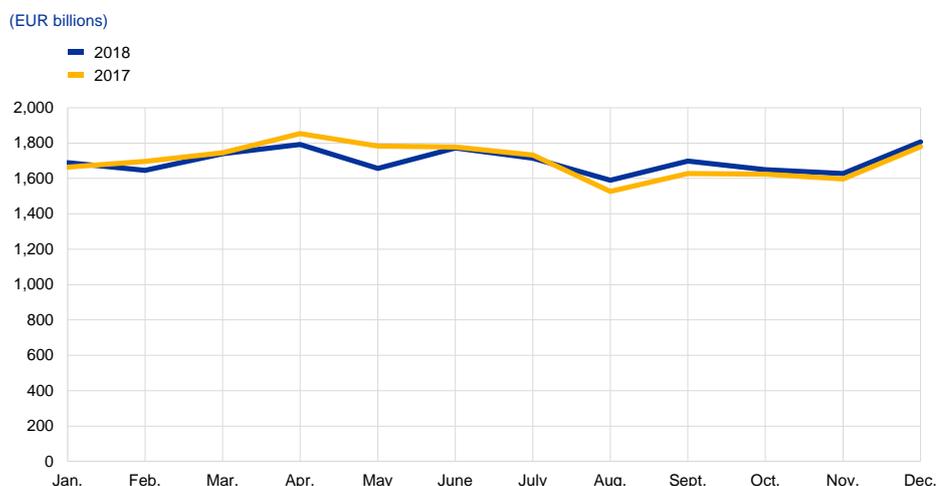
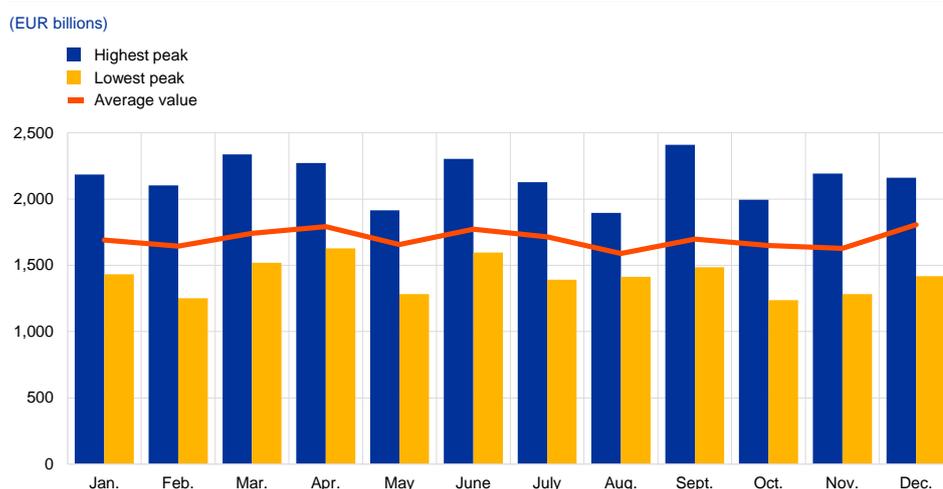


Chart 3 displays the highest and lowest daily TARGET2 values for each month of 2018, as well as the average daily values for each month. Usually, the days with the highest peaks are at quarter-ends, typically on the last days of the month, owing to reimbursements and due dates in various financial markets. This seasonal pattern was also visible in 2018, when the day with the largest turnover of the year, with a total value of €2,409 billion, was 28 September.

## Chart 3

### Monthly maxima and minima, troughs and averages of TARGET2 daily values in 2018



Throughout 2018, the amplitude of TARGET2 turnover, expressed by the difference between the highest and the lowest value, was 48%,<sup>9</sup> compared with 50% in the

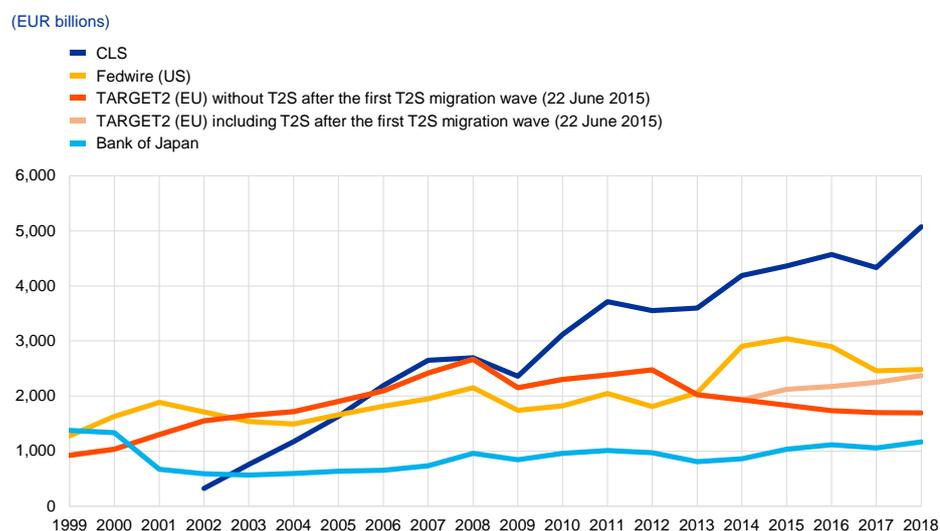
<sup>9</sup> The difference between the highest and the lowest value recorded during the year was 50% of the highest recorded value.

previous year. Overall, the average values through the year followed a well established seasonal pattern.

Peaks and troughs in the system's values can also be influenced by other factors, such as TARGET2 holidays or the end of reserve maintenance periods. For example, the lowest values are typically observed during the summer holidays and on days that are national holidays in some Member States or in other important economies. For example, in 2018, the lowest values processed coincided with public holidays observed in the United States.

Finally, Chart 4 compares traffic developments in the world's major payment systems. In particular, it depicts the daily average turnover in euro equivalents for the last 20 years of TARGET2(2), Continuous Linked Settlement (CLS), Fedwire Funds (the USD-denominated RTGS system operated by the Federal Reserve System) and the Bank of Japan Financial Network System (BOJ-NET). Some common patterns, including the effect of the financial crisis on the number of processed transactions, can be identified across systems. However, the comparability of TARGET2 with other systems is hampered by the change in the TARGET2 statistical methodology in 2013, as well as by the migration of the securities settlement systems to T2S.<sup>10</sup> In the latter case, if the average daily volume in TARGET2 after 2015 were considered together with the average daily turnover on DCAs, which are technically held in T2S, total traffic would have continued to increase.<sup>11</sup>

**Chart 4**  
Major large-value payment systems around the globe



Sources: Fed website: [Fedwire Funds Service](#); Bank of Japan website: [BOJ Time-Series Data](#); ECB data.

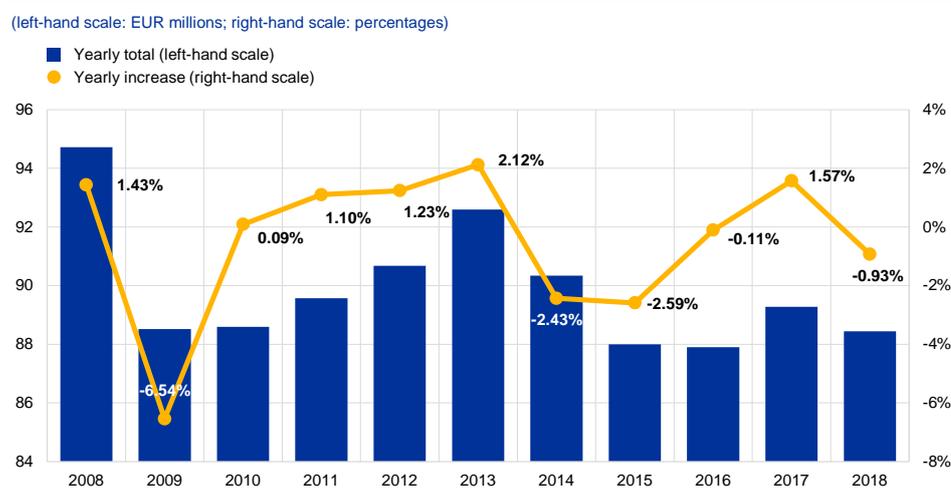
<sup>10</sup> It should, however, be taken into account that, while the illustrated trends present an indication of the size of each system and a long-term pattern, they are also affected by fluctuations in the euro's exchange rate vis-à-vis the US dollar and Japanese yen, which may distort the figures. As both Fedwire Funds and CLS publish their turnover in US dollars and the Bank of Japan in Japanese yen, the turnover in euro is calculated on the basis of the exchange rate of the ECB for the last business day of the year in question.

<sup>11</sup> In 2018 the average daily turnover of TARGET2 including transactions on T2S DCAs amounted to almost €2,400 billion compared with €2,250 billion in 2017.

## 1.2 Volume of transactions in TARGET2

After low transaction volumes resulting from the financial crisis, TARGET2 traffic recovered, posting a positive trend between 2010 and 2013 (Chart 5). Although the number of transactions never reached pre-crisis levels, the system attracted around 4 million transactions more over that period. However, this trend was reversed in 2014 and 2015. During this period, owing to the finalisation of the migration to SEPA instruments,<sup>12</sup> there was again a significant reduction in the customer payment segment, leading to lower TARGET2 volumes. Following the completion of the migration to SEPA, TARGET2 traffic stabilised at 88 and 89 million transactions yearly.<sup>13</sup>

**Chart 5**  
TARGET2 traffic



The exact volume settled in TARGET2 in 2018 amounted to 88,442,641 transactions, corresponding to a daily average of 346,834 payments. Compared with the previous year, the overall number of processed payments fell by around 1%. The decrease was driven mainly by the lower number of ancillary system-related transactions owing to the completion of the migration of CSDs to T2S, which was not fully offset by the increase recorded in the other segments, in particular customer and interbank. More detailed information on the evolution of the different traffic segments is provided in Box 1.

<sup>12</sup> With this major change for the industry, some participants reconsidered the routing policies for their customer payments and ultimately chose in favour of channels other than TARGET2, mainly SEPA-compliant ACHs, with some banks' customers (mainly large corporates) specifically requesting this.

<sup>13</sup> If the volume of transactions processed in T2S DCAs is included, this figure doubles, reaching more than 180 million transactions. More details of the number of transactions settled on T2S DCAs, i.e. cash legs of delivery-versus-payment transactions, can be found on the ECB website: [Monthly statistics of payment instructions processed by TARGET and EURO1/STEP1](#).

## Box 1

### Traffic evolution in TARGET2

The Eurosystem has been carefully monitoring the development of TARGET2 volumes over time, especially given their relevance for TARGET2 revenues and cost recovery. This box aims to share the insights gained from the analysis of the 2018 volumes.

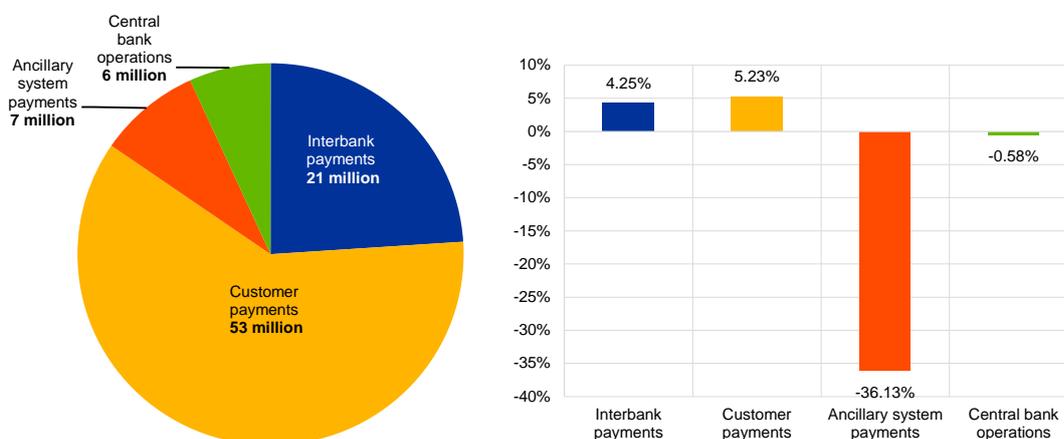
In 2018, customer payments accounted for 61% of the total TARGET2 traffic in terms of volume, followed by interbank payments (24%), ancillary system payments (9%) and other payments such as central bank operations (7%).

Customer payments traffic increased by 5.23% compared with 2017, driven primarily by increased traffic in Germany, the Netherlands and France. Interbank payments traffic increased by approximately 4.25% compared with 2017, with the increase evenly distributed across countries. Central bank-related payments decreased slightly, by 0.58%.

Meanwhile, the greatest change in relative terms was seen in ancillary system traffic. In September 2017 the T2S migration phase concluded, with the final wave transferring ancillary system traffic from Baltic CSDs and Iberclear to T2S. This led to a 36.13% reduction in annual ancillary system volumes, as compared with 2017. However, this decrease was to a large extent counteracted by positive developments in customer and interbank payments, which account for the largest shares of TARGET2 traffic, resulting in only a slight overall drop in TARGET2 volumes, by 0.89%.

### Chart A

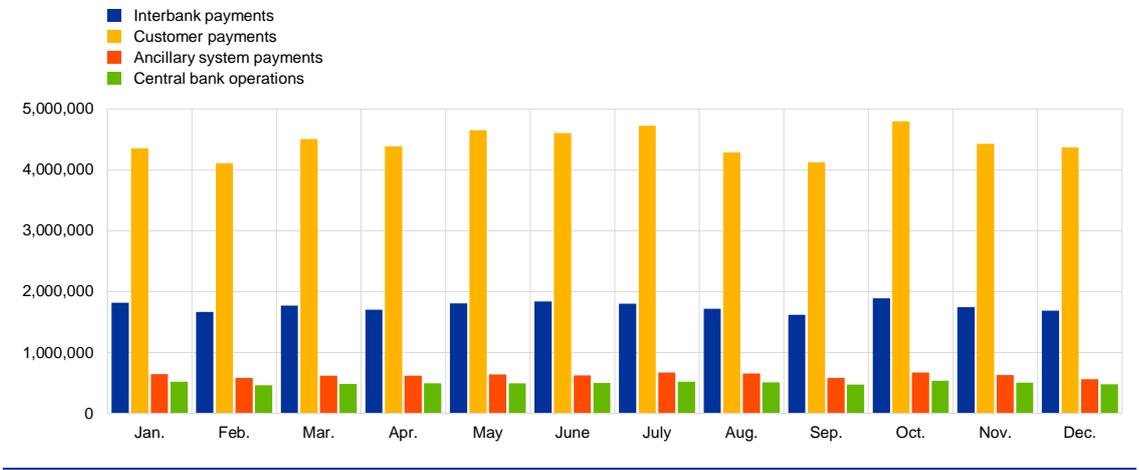
TARGET2 traffic – volume distribution and yearly growth rate for 2018 payments by payment type



Customer payments ranged between 4.1 and 4.8 million transactions per month during 2018. Historically, customer payments exhibit strong seasonal patterns, typically with a decrease in traffic around April (Easter) and the summer months (August and September), and an increase towards the year-end (see Chart B for the particular seasonal patterns observed in 2018). Meanwhile, interbank payments ranged between 1.6 and 1.9 million transactions per month during 2018, and were affected by similar seasonal trends. In contrast, ancillary systems and operations with central banks are not significantly affected by seasonal patterns.

**Chart B**

TARGET2 traffic – number of interbank, customer, ancillary system and central bank-related payments per month in 2018

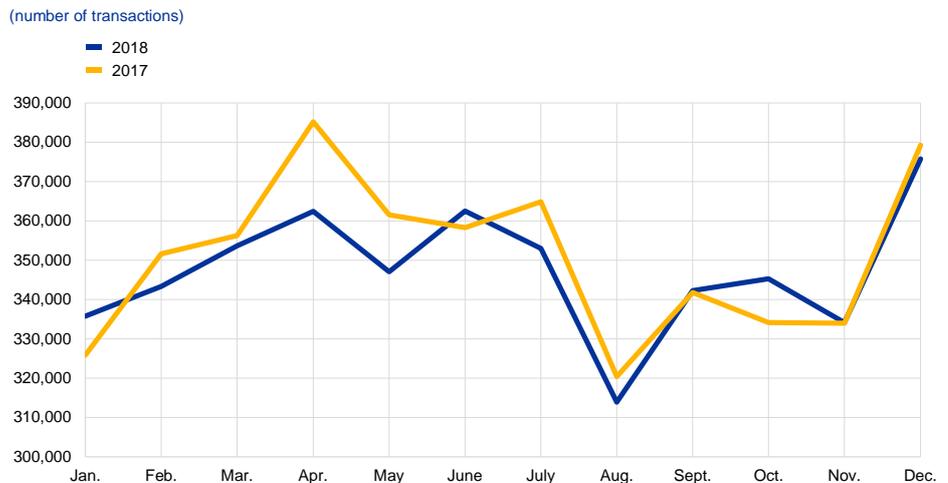


Following the final T2S migration wave in September 2017, the share of ancillary system traffic in TARGET2 dropped from 15% to 9% and has remained stable throughout 2018. Finally, payments related to central bank operations also remained relatively stable in 2018.

For more than half of 2018 months, average daily volumes in TARGET2 calculated on a monthly basis were below the levels recorded for the corresponding months of 2017 (Chart 6). The biggest difference, of 6%, was observed in April owing to the peaks around the Easter holidays that increased the average volumes in 2017. Overall, Chart 6 indicates a seasonal pattern that was very similar to the previous year's.

**Chart 6**

Average daily TARGET2 volumes per month



The highest average daily volume was recorded in December, when it reached more than 375,000 transactions. Such high figures can be associated with high daily volumes normally observed at the end of the year.

Chart 7 depicts the peaks and troughs in terms of daily volume on RTGS accounts in TARGET2 in 2018 and the average daily volume for each month. As already observed in the value-based figures, the peaks typically fall on the last day of the month, and are especially pronounced at the quarter-end for the same reasons (i.e. deadlines in financial markets or for corporate business). In 2018 the highest daily volume was recorded on 3 April, which was the first day after the Easter holidays, when 591,010 transactions were processed. The lowest daily volume was recorded on 1 November (230,276 transactions), i.e. a public holiday in most European countries (All Saints' Day). Similar developments were also observed in 2017 when the highest yearly peak was as well recorded on the first day after the Easter time and the lowest on 1 November.

### Chart 7

Monthly peaks, troughs and averages of TARGET2 daily volumes in 2018

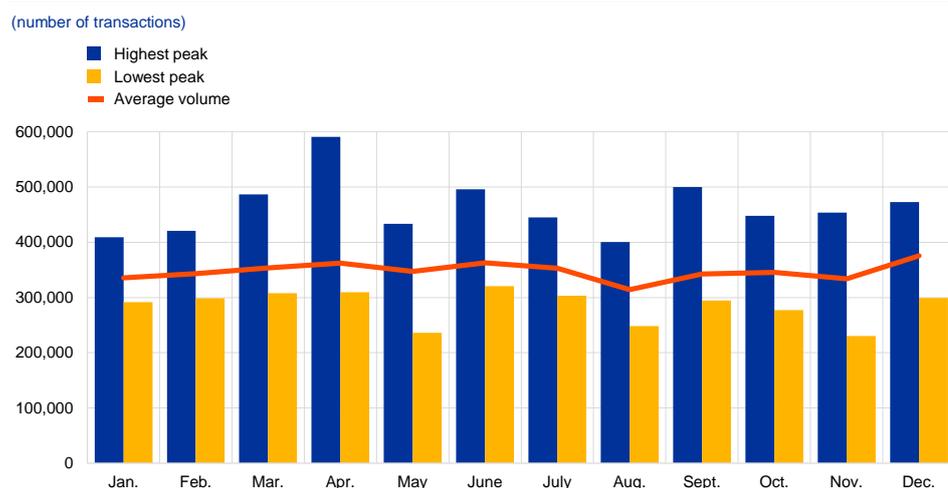


Chart 8 shows the yearly moving average of TARGET2 volumes (i.e. the cumulative volume processed in the preceding 12 months) for each month. This indicator helps to eliminate the strong seasonal pattern observed in TARGET2 traffic. The variation of this cumulative volume from one year to the next is also presented as a percentage. The chart shows that the cumulative volume started to decline in the second half of 2008, when the financial crisis erupted. The number of transactions continued to drop sharply almost until the end of 2009. After that, TARGET2 volumes were roughly stable until the end of 2011. They then started to grow moderately until the end of the first quarter of 2014, when they reached their highest point since the crisis. Thereafter, the cumulative volume started dropping for the reasons already explained at the beginning of this section (SEPA migration) and, in October 2014, the cumulative growth rate on a yearly basis turned negative and decreased again until mid-2017. The negative trend was reversed in 2017 owing to the increases observed in the customer and interbank payments segment and it remained stable across 2018.

## Chart 8 TARGET2 volumes

(left-hand scale: in million transactions; right-hand scale: percentages)

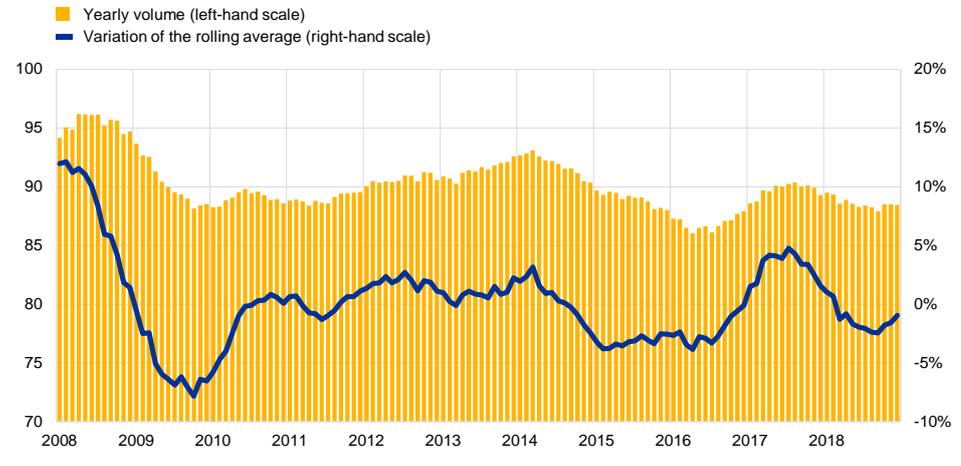
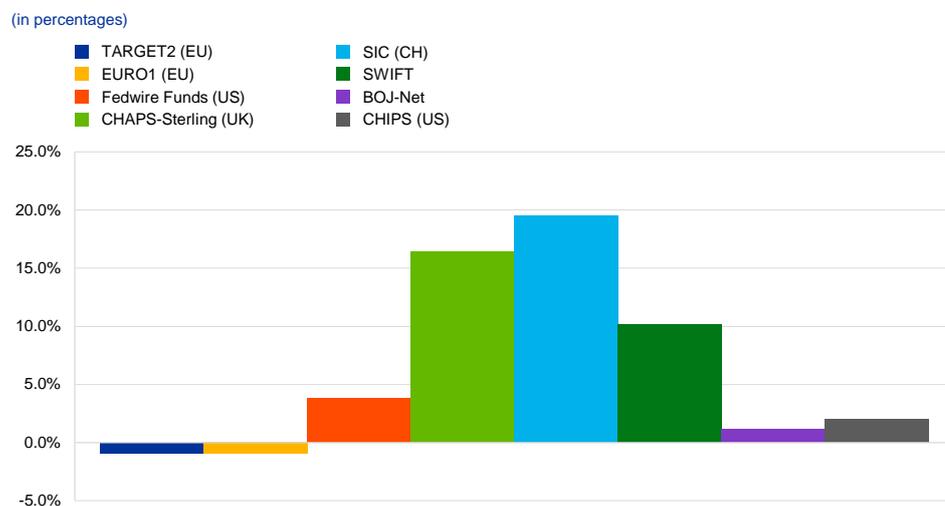


Chart 9 compares the growth rate (between 2017 and 2018) of traffic in TARGET2 with the growth rates of the major payment systems worldwide as well as with the growth rate of the SWIFT payment-related FIN traffic (categories 1 and 2). The chart reveals that, with the exception of TARGET2 and EURO1,<sup>14</sup> the traffic of the main payment systems increased in this period. The decline observed for EURO1 may be attributable, as in previous years, to the ongoing shift of traffic from large-value payment systems to ACHs. The most considerable increase – of almost 20% – was recorded by SIC (CH), followed by CHAPS (UK).

<sup>14</sup> A detailed comparison of TARGET2 with EURO1 is provided in Section 1.4.

## Chart 9

### Comparison of the changes in traffic in some major large-value payment systems and SWIFT between 2017 and 2018



Sources: Fed website: [Fedwire Funds Service](#); SWIFT website: [SWIFT FIN traffic](#); Bank of Japan website: [BOJ Time-Series Data](#); Bank of England website: [Key payment statistics](#); The Clearing House website: [Annual Statistics From 1970 to 2019](#); SIX-SIC website: [SIC statistics](#); ECB data.

## 1.3 Interactions between TARGET2 and T2S<sup>15</sup>

T2S is the Eurosystem's pan-European platform for securities settlement in central bank money, which went live on 22 June 2015. It brings together both securities and cash accounts on a single technical platform, the T2S platform.

Although the accounts are centralised on a single platform, the legal and business relationships of the holders of the securities and cash accounts remain with the CSDs and national central banks respectively.

DCAs are opened with the national central banks and used exclusively for the securities settlement business in T2S. While technically held on the T2S platform, they are legally part of TARGET2. At the end of 2018, there were 819 active DCAs on the T2S platform.

2018 was the first full year after the end of the T2S migration period. Moreover, on 29 October 2018 the Danmarks Nationalbank successfully connected Kronos2, its real-time gross settlement and collateral management system, to T2S, thereby allowing for the settlement of securities transactions in Danish kroner. On the same date, VP Securities (a Danish CSD that had already been using T2S for settlement in euro) migrated its Danish krone settlement to the platform.

At the start of each T2S business day, liquidity is sent from TARGET2 to T2S, while, towards the end of the day, any remaining liquidity on DCAs is swept back to the

<sup>15</sup> For more information on T2S, please refer to T2S Annual Report 2018.

RTGS accounts in TARGET2.<sup>16</sup> During the day, liquidity can be freely transferred from TARGET2 to T2S and vice versa.

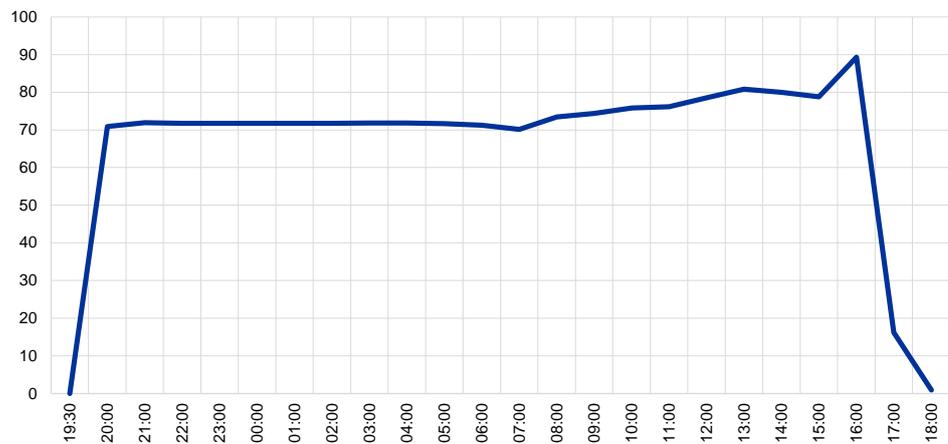
In 2018 an average of 581 inbound liquidity transfers from TARGET2 to T2S and 648 outbound liquidity transfers from T2S to TARGET2 took place every day.

Chart 10 compares the average cumulative central bank liquidity held in T2S on a daily basis between January and December 2018.<sup>17</sup>

### Chart 10

#### Time distribution of liquidity in DCAs in 2018

(EUR billions, daily averages)



In terms of intraday pattern, liquidity is injected into T2S at the beginning of the TARGET2 night-time phase (19:30) and its level then remains fairly constant until the start of the T2S daytime phase (from 05:00 onwards). During the day, more liquidity reaches T2S and fluctuations occur. Around 16:00, there is a spike in the liquidity held in T2S, owing to participants sending liquidity to T2S to reimburse auto-collateralisation and ensure the settlement of remaining transactions. At 16:30 the liquidity in T2S decreases sharply as a consequence of the optional cash-sweep that brings liquidity back from T2S to TARGET2. The next drop, to zero, is observed towards the end of the business day and is related to the execution of the automated cash-sweep from T2S to TARGET2 at 17:45, when all remaining liquidity on DCAs is pushed from T2S back to TARGET2. It should be noted that the optional cash-sweep is preferred to the automated cash-sweep.

Chart 11 represents the daily average value of auto-collateralisation in T2S per month.

<sup>16</sup> T2S provides two cash sweeps to transfer liquidity back to TARGET2 at the end of the business day:  
- the optional cash sweep at 16:30;  
- the automated cash sweep at 17:45.

<sup>17</sup> The overall liquidity is computed hourly.

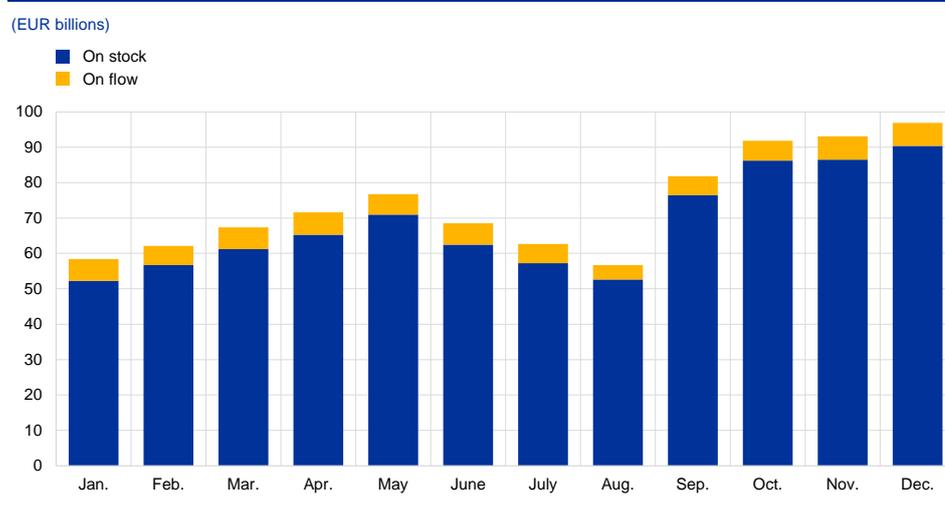
The use of auto-collateralisation on-flow, i.e. settlement transactions that are financed via credit received from a central bank and collateralised by securities that are about to be purchased, remained relatively stable throughout the year.

The usage of auto-collateralisation on-stock, i.e. where the credit received from the central bank is collateralised by securities already held by the buyer, started to increase from September 2018.

On average, in 2018 92.21% of the total value of auto-collateralisation was represented by auto-collateralisation on-stock and 7.79% by auto-collateralisation on-flow.

### Chart 11

Daily average value of auto-collateralisation in T2S in 2018 for both euro and Danish kroner activity



Note: amounts settled in Danish kroner are converted into euro at an exchange rate of EUR 0.13/DKK 1.

## 1.4 Interactions between TARGET2 and TIPS

TARGET Instant Payment Settlement (TIPS) is the new service for the settlement of instant payments introduced on 30 November 2018. TIPS is a harmonised and standardised pan-European service with common functionality across different countries and jurisdictions. It is used to settle payments instantly in central bank money, with a high capacity and 24/7/365 availability.

TIPS provides for the sending and receipt of instant payments, liquidity transfers, as well as recalls of settled instant payment transactions, based on the ISO 20022 standard and in accordance with the SEPA Instant Credit Transfers (SCTInst) scheme. These instant payments are settled on TIPS Dedicated Cash Accounts (TIPS DCAs) held with the respective national central banks.

The primary aim of TIPS is to offer instant settlement services in euro to its participants, extending the services offered by TARGET2. TIPS is also designed to be

currency-agnostic, providing settlement in non-euro central bank money if requested by being able to connect to any other RTGS system.

Before TIPS went live, TARGET2 was adapted to ensure its smooth interaction with TIPS, in a similar fashion to the adaptations required before T2S went live. These adaptations entailed (i) mechanisms to push and pull liquidity between TARGET2 and TIPS; (ii) upgrades to the Reserve Management (RM) and the Standing Facilities (SF) modules to allow for the fact that the overnight balances kept on the TIPS DCAs are taken into account in the participants' minimum reserves and reduce the need for automatic marginal lending at times when the participant's credit line on its RTGS accounts in TARGET2 is not fully reimbursed at the end of the business day; and (iii) liquidity management features for TIPS, similar to the value-added services offered for T2S, which allow TARGET2 participants to use their ICM screens to monitor their liquidity positions in real time, now also including the balance on their TIPS DCA(s).

Legally, the euro-denominated TIPS DCAs fall under the perimeter of TARGET2, and therefore, the rights and obligations of TIPS DCA holders are included in the TARGET2 Guideline.

## 1.5 Comparison with EURO1

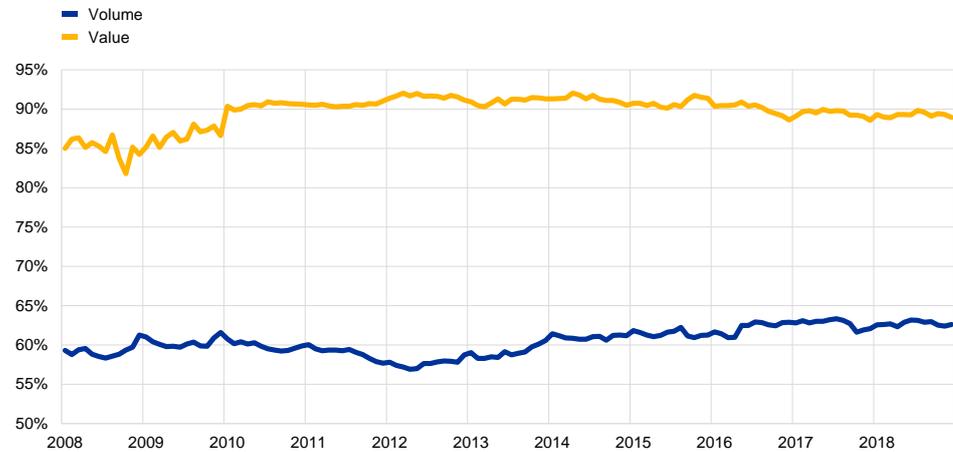
EURO1 is the only direct competitor of TARGET2 among large-value payment systems denominated in euro. Thus, the market share of TARGET2 is defined as its relative share vis-à-vis EURO1, and this is depicted in Chart 12. The two systems are different by design, since EURO1 operates on a net settlement basis and only achieves final settlement in central bank money at the end of the day. Furthermore, they respond in part to different business cases, since only TARGET2 settles in central bank money and processes ancillary system transactions and payments related to monetary policy operations. However, the actual composition of the traffic in the two systems is made up largely of interbank and customer payments. This helps to explain, in part, the relative share of TARGET2 vis-à-vis EURO1, as shown in Chart 16, which takes into account only these two payment categories. In 2018, TARGET2 maintained its share in terms of both the value and volume of the payments processed. It processed 90% of the value and 63% of the volume settled by large-value payment systems in euro.

When reading Chart 12, it should be kept in mind that it does not provide a full picture of the banks' routing preferences vis-à-vis all systems, but only a partial picture of the market's preferences related to the settlement of large-value euro-denominated transactions. In particular, the extent to which payments are channelled through ACHs or correspondent banking arrangements is not reflected in this chart.

**Chart 12**

**Market share of volumes and values settled in TARGET2 vis-à-vis EURO1**

(in percentages)



Source: ECB website: [TARGET/Euro LVPS](#).

Note: This chart is not affected by the change in the statistical methodology implemented in 2013 since the calculations are based on interbank and customer payments only, and do not include transactions with the central banks, which were the ones most affected by the methodological change.

## 1.6 Value of TARGET2 payments

Chart 13 shows the evolution of the average value of a TARGET2 payment between 2008 and 2018.<sup>18</sup> The continuous decrease from 2015 to 2017 can be associated with the migration to T2S of securities settlement system traffic.<sup>19</sup> In 2017 and 2018 the average value of a payment stabilised at €4.8 million.

<sup>18</sup> As explained in Section 1.1, the sudden drop in the average value in 2013 is attributable to the change in the statistical methodology.

<sup>19</sup> The cash legs of security transactions are typically high-value operations.

### Chart 13

#### Average value of a TARGET2 payment

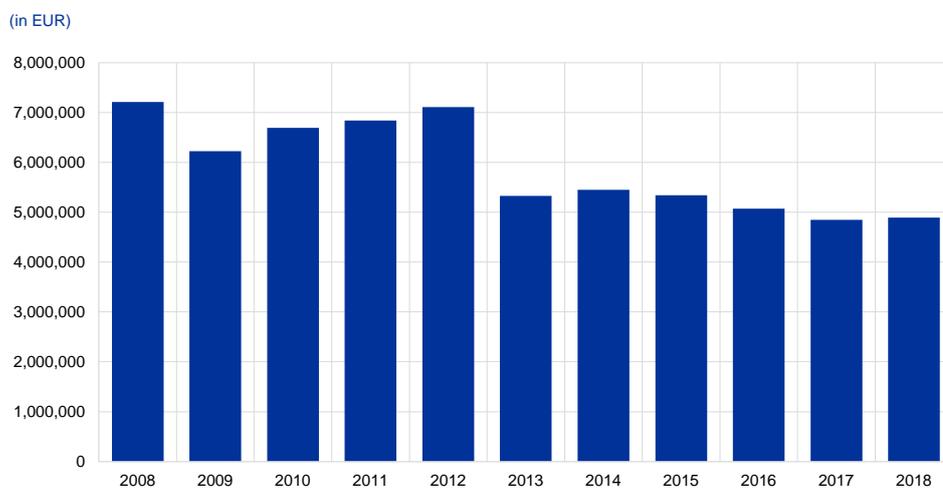
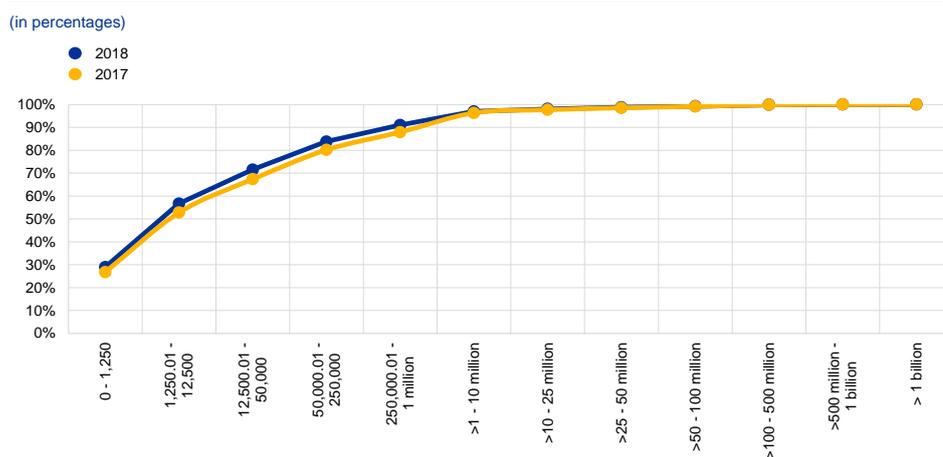


Chart 14 illustrates the distribution of TARGET2 transactions per value band, indicating the shares, in terms of volume, that fall below a certain threshold. The picture remained similar to that of the previous year. Generally, 70% of all TARGET2 transactions were for values of less than €50,000. Payments of above €1 million accounted for only 9% of traffic, compared with 12% in the previous year, which can also be associated with the completion of the migration to T2S of settlement security systems' transactions.

### Chart 14

#### Distribution of TARGET2 transactions across value bands in 2018



On average, there were almost 170 payments per day with a value of above €1 billion, which accounted for 0.05% of payment flows. Given the wide distribution of transaction values, the median payment in TARGET2 is calculated as €7,260, which indicates that half of the transactions processed in TARGET2 each day are for a value lower than this amount. This figure confirms that TARGET2 offers a range of features

attracting a high number of low-value transactions, especially of a commercial nature. Although the picture has changed slightly since the completion of the migration to SEPA, particularly as regards commercial payments, TARGET2 is still widely used for low-value payments, especially urgent customer transactions. This is not unusual in the field of large-value payments and is also observed in other systems worldwide.

### Chart 15

#### Intraday pattern: average value of a TARGET2 payment

(EUR millions)

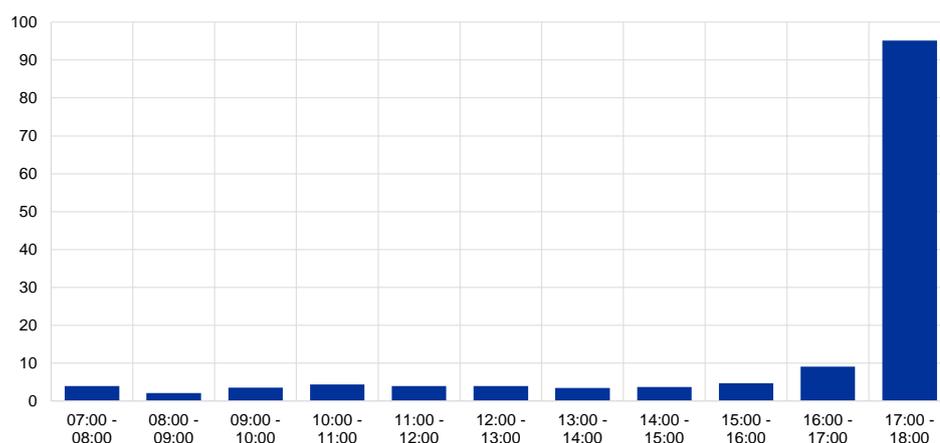


Chart 15 depicts the average value of TARGET2 payments executed at different times of the day. The chart indicates that in 2018, as in previous years, TARGET2 settlement was marked by a strong intraday pattern. After the system opens at 07:00, the hourly average value of transactions fluctuates minimally throughout the day. Between 09:00 and 13:00 the average value increases slightly, owing to the settlement of CLS and other ancillary system transactions around this time. A more visible increase is recorded between 16:00 and 17:00, while an optional cash sweep from T2S DCAs to TARGET2 is taking place and when ancillary systems such as EURO1 settle their cash balances in TARGET2. The last hour of operations, between 17:00 and 18:00, is reserved for interbank transactions, while the cut-off time for customer payment types is 17:00. The average size of payments increases dramatically over this time, owing to banks squaring their balances and refinancing themselves on the money market. Overall, the last two hours of the TARGET2 operation are characterised by a limited number of transactions, albeit at very high values. After increasing for a few years, in 2018 the average payment value in this period was 14% lower than in 2017.

The chart does not take into account the payments that take place before the start and after the end of the business day, since these transactions fall under the night-time settlement category (see Section 1.6) and relate to pure accounting, e.g. liquidity transfers from the local accounting systems of central banks or fuelling of sub-accounts as well as T2S DCAs.

## 1.7 Night-time settlement in TARGET2<sup>20</sup>

TARGET2 operates during the day from 07:00 to 18:00, and also offers the possibility of settling payments during the night. While in the day trade phase the system is open to regular payments business of financial institutions and ancillary systems, night-time settlement is only for ancillary systems connecting via the ASI as well as liquidity transfers to/from T2S and TIPS.<sup>21</sup> Other operations, such as bank-to-bank transactions or customer payments, are allowed only during the day.

There are two night-time settlement windows: 19:30 to 22:00 and 01:00 to 07:00. The two windows are separated by a technical maintenance window, during which no settlement operations are possible.

Since the system is closed during the night to any other form of payments processing, ancillary systems can take advantage of banks' stable and predictable liquidity situations, thereby settling their transactions efficiently and safely. Overall, the night-time windows are used mainly by retail payment systems. On average, around 1,500 payments, representing a value of €12 billion, were settled every night in TARGET2 in 2018. Both figures are significantly lower than in 2017, due mainly to two events that occurred at the end of 2017: the migration of securities settlement systems to T2S and the processing schedule of a significant ancillary system, which moved parts of the bulk settlement from night-time settlement to daylight settlement.

Chart 16 shows how the volume and value settled in TARGET2 during the night have evolved since 2009. The increase in volume in November 2011 relates to the ancillary system SEPA Clearer starting to make use of the night-time settlement service in TARGET2. Since then, the number of payments settled at night has increased steadily, notably in 2014, whereas values have remained fairly stable. The trend reversed in 2015, with both night-time settlement values and volumes continuously decreasing. As indicated above, the changes in the night-time settlement pattern in this period can be attributed primarily to securities settlement systems that have migrated their operations to T2S. In December 2018 night-time settlement values and volumes reached historically low levels due to the move of TARGET2 night-time settlement activity to the daylight phase.

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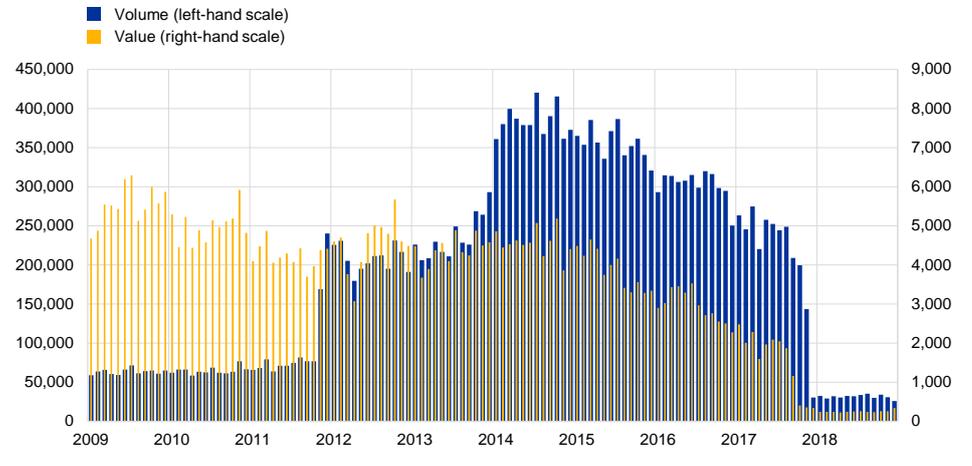
<sup>20</sup> As explained in the disclaimer at the beginning of the chapter, the figures for night-time settlement do not include liquidity transfers between TARGET2 and T2S.

<sup>21</sup> Since 30 November 2018.

**Chart 16**

**Night-time settlement in TARGET2**

(left-hand scale: number in transactions; right-hand scale: EUR billions)



## 1.8 Payment types in TARGET2

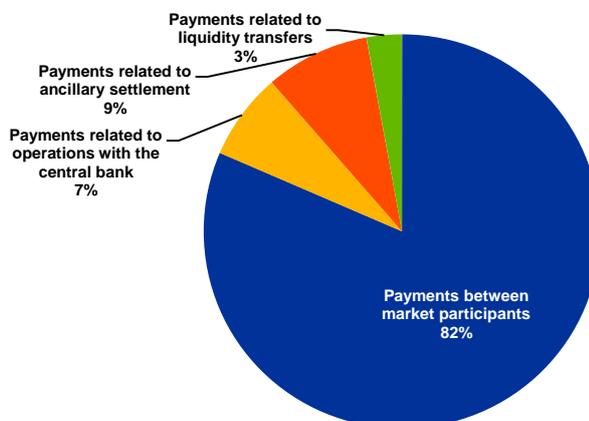
Charts 17 and 18 present the breakdown of TARGET2 volumes and turnover by type of transaction. Traffic is divided into four categories: payments to third parties (e.g. interbank transactions and customer transactions), payments related to operations with the central bank (e.g. monetary policy operations and cash transactions), ancillary system settlement, and liquidity transfers among participants belonging to the same group.

More than 80% of the TARGET2 volume is made up of payments to third parties, namely payments between market participants. The volume of ancillary system settlement represents 9% of the total volume, 7% is generated through operations with the central bank, and the remaining share of 3% is linked to liquidity transfers. Overall, all these figures remained similar to those of the previous year.

### Chart 17

#### Breakdown of TARGET2 volumes in 2018

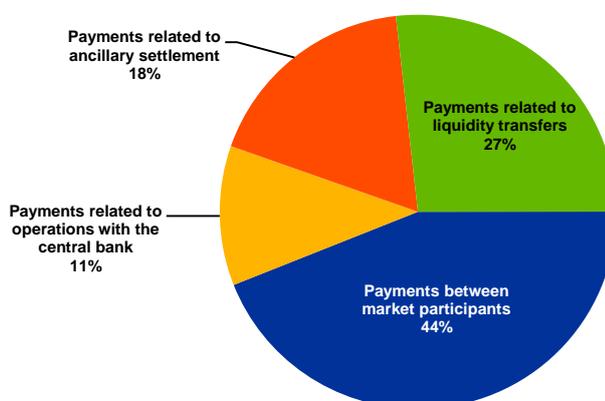
(in percentages)



### Chart 18

#### Breakdown of TARGET2 turnover in 2018

(in percentages)



With regard to turnover, payments between participants represent only 44% of total value. As a consequence of the lower values settled by securities settlement systems using ASI, in 2018 the share of payments related to ancillary system settlement decreased further, accounting for less than one fifth of total turnover, i.e. slightly lower than in 2018.

The difference between the volume-based and value-based indicators across payment categories stems from the fact that the average sums involved in monetary policy transactions, ancillary system instructions and liquidity transfers are typically much larger than payments to third parties.

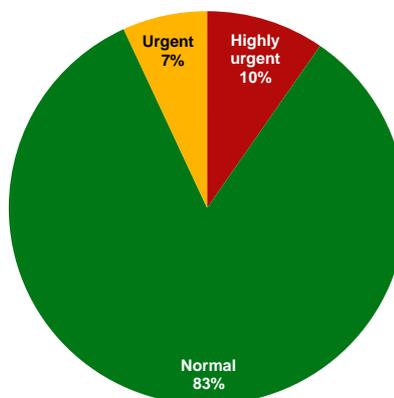
## 1.9 The use of prioritisation

Priority options help TARGET2 participants optimise their liquidity usage by allowing them to reserve a certain amount of liquidity for specific payment priorities. When submitting payments in TARGET2, participants can assign them a certain priority: “normal”, “urgent” or “highly urgent”. In general, payments are settled immediately on a “first in, first out” basis, as long as sufficient liquidity is available in the participant’s RTGS account. However, if this is not the case, payments that cannot be settled immediately are queued according to their priority. Participants can reserve a set amount of their liquidity for the priority classes “urgent” and “highly urgent”, and less urgent payments are made when the excess liquidity is sufficient. This is a way of securing liquidity for more urgent payments. The priorities for pending transactions can be changed at any time via the information and control module (ICM).

Chart 19 gives an overview of the use of priorities in TARGET2 in 2018 in terms of the overall TARGET2 volume. It shows that more than 80% of transactions were assigned normal priority, while 10% were highly urgent and the remaining part urgent. The distribution of the use of the priorities when submitting payments to TARGET2 has remained stable over the years and participants acknowledge the benefits of this feature.

### Chart 19

Use of priorities in TARGET2 in 2018

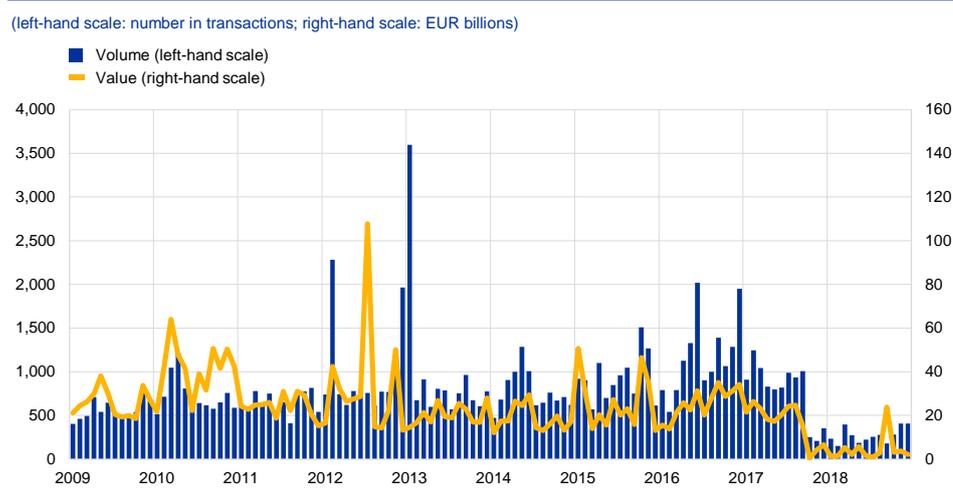


## 1.10 Non-settled payments

Non-settled payments in TARGET2 are transactions that are not processed by the end of the business day due to, for example, participants’ erroneous transactions, a lack of funds in the account to be debited or the sender’s limit being breached, and are ultimately rejected. Chart 20 shows the evolution of the daily average of non-settled payments on a monthly basis between 2009 and 2018 in terms of both volume and value. The average daily number of non-settled transactions in 2018 decreased sharply, amounting to as little as 273 transactions for the whole year (i.e. a two-thirds

decrease in unsettled transactions compared with the average observed in 2017). The decrease was mainly driven by the migration to T2S at the end of 2017 of one of the securities settlement systems. Due to its gross settlement model, some of its transactions were rejected, due either to liquidity shortage or cancellation, and reported as non-settled TARGET2 payments.

**Chart 20**  
Non-settled payments in TARGET2



For the same reasons, the average daily value of non-settled payments also decreased drastically, falling to an average of just €4.5 billion for the whole year.

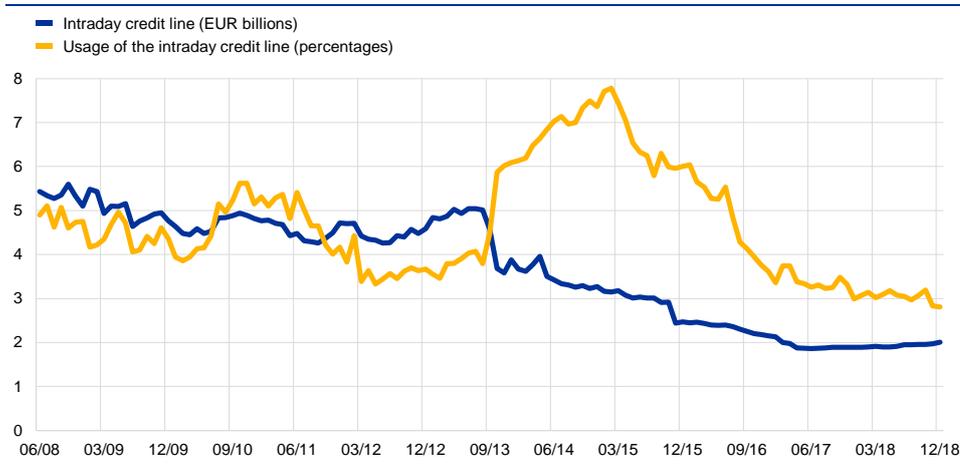
Overall, non-settled payments in 2018 represented 0.08% of the total daily volume and 0.3% of the total daily turnover in TARGET2. The levels can be considered very low and confirm that the distribution of liquidity across participants was appropriate throughout that period.

## 1.11 Use of credit lines in TARGET2

The intraday credit line is a facility in TARGET2 through which banks can overdraw their intraday account against eligible collateral. Overall, the level of TARGET2 intraday credit lines and their usage decreased after the launch of the asset purchase programme (APP) in March 2015, which created a high level of excess liquidity in the system (see Chart 21). In 2018 the average maximum intraday credit line at participant level has stabilised at around the levels of 2017, and stood at EUR 1.93 billion. Likewise, the usage of the intraday credit line only slightly decreased in 2018 relative to 2017. More precisely, in 2018, approximately 3% of the total payments were settled via the intraday credit line, while in 2017 this figure was approximately 3.4%.

**Chart 21**

**TARGET2 intraday credit line and its usage**



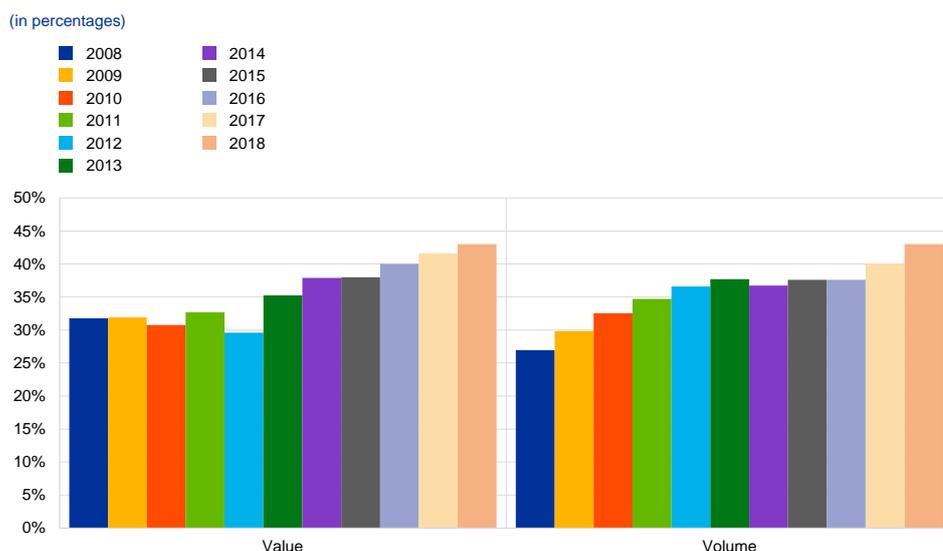
Note: The chart covers the period from June 2008 to December 2018. Figures represent monthly averages. The intraday credit line is calculated as the maximum intraday credit that can be accessed on average by one bank during the day against collateral posted. The usage of the intraday credit line represents the percentage of payments that are settled using the intraday credit line, calculations based on McAndrews J. and Rajan S., "The timing and funding of Fedwire Funds transfers", *Economic Policy Review*, Federal Reserve Bank of New York, 2000.

## 1.12 Share of inter-Member State traffic

The share of inter-Member State traffic in TARGET2 indicates the percentage of traffic that is exchanged between participants belonging to different banking communities. Chart 22 shows that, in 2018, this share continued to increase, reaching 43% both in value and in volume. Overall, since 2009, there has been a positive trend in both volume-based and value-based indicators, reflecting the increasing level of financial integration in the large-value payment segment, largely supported by TARGET2.

**Chart 22**

**Share of inter-Member State traffic in TARGET2**



When analysing these data, it should be kept in mind that whether a payment is sent or received by a given banking community may have more to do with the bank's internal organisation than its actual geographical domicile. For example, a subsidiary of a French bank, located in Italy, owing to its internal organisation, may send TARGET2 payments to another bank, also located in Italy, via its headquarters established in France. In such a case, the payment flow will be considered to be a cross-border one, although the payment is taking place between two entities located in the same country. By contrast, banks located in EEA countries whose central banks do not provide TARGET2 services, e.g. the United Kingdom or Sweden, can participate in TARGET2 component systems provided by other central banks. For example, if a Swedish bank participating in TARGET2-Bank of Finland sends TARGET2 payments to banks in Finland that also participate in TARGET2-Bank of Finland, the payment flows will be considered as domestic, although they are taking place between entities located in different countries.

The inter-Member State payments shown in Chart 22 were identified based on the national banking communities of the sending and receiving direct participants on the platform. Since it is also possible to connect to TARGET2 from a non-EEA country, e.g. as an indirect participant or addressable BIC holder, the evolution of the cross-border share in terms of volume was also computed on the basis of the originator and beneficiary of the payment, taking into account the full payment chain information (i.e. originator, sending settlement bank, receiving settlement bank, beneficiary). When calculating the inter-Member State shares based on the originator and beneficiary of the payment, the share of cross-border payments in 2018 amounted to 56% in terms of volume and 42% in terms of value. Therefore, taking into account the full payment chain leads to a significantly higher cross-border share in volume and a slightly higher one in terms of value.

## Box 2

### Intraday payment patterns in TARGET2

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The distribution of payments settlement throughout the day is monitored by the TARGET2 operator as it can reflect the operational and liquidity risk that RTGSs and their participants are exposed to.

Typically, the earlier payments are settled the better, since the concentration of a significant amount of payments towards the end of the business day could increase operational risk.<sup>22</sup> This box analyses intraday<sup>23</sup> payments patterns in TARGET2 from June 2008 until end-2018. Since liquidity availability plays an important role in the timely settlement of payments, the box also distinguishes between pre-asset purchase programme (APP) vs post-APP periods<sup>24</sup> given the very distinct liquidity levels characterising these periods. Following large-scale asset purchases within the APP, excess liquidity in the euro area has reached approximately EUR 1.9 trillion.

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<sup>22</sup> For instance, if a technical problem were to occur towards the end of the day, this would be much easier to handle in a system that settles earlier in the day and which, by the time of the incident, would have already processed most of its payments, as compared with a system that settles later in the day.

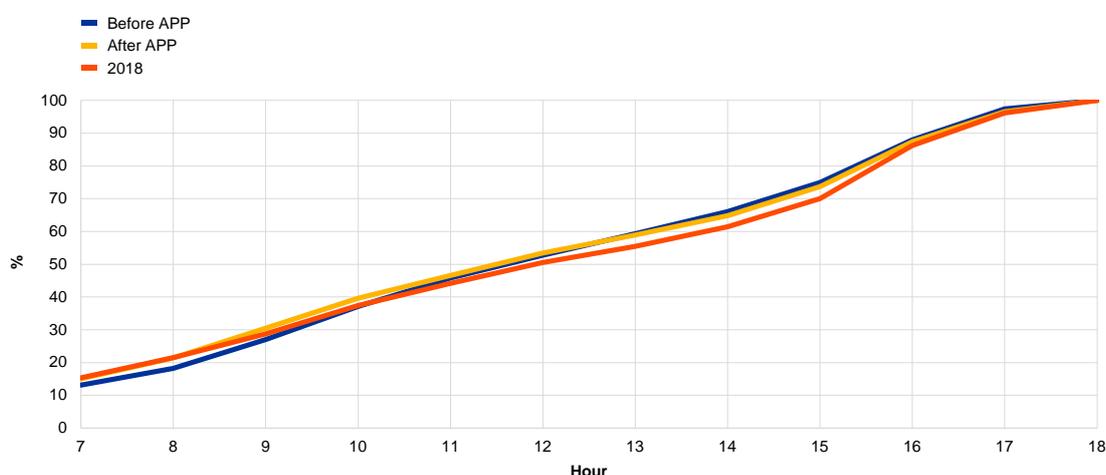
<sup>23</sup> Daytime processing in TARGET2 is from 7:00 to 18:00, with cut-off time for customer payments at 17:00 and for interbank payments at 18:00.

<sup>24</sup> In particular, we investigate the period from June 2008 to February 2015 as the pre-APP period, from March 2015 to December 2017 as the post-APP period, treating 2018 as a separate period.

Payment patterns in TARGET2 have remained generally stable over time and across different overall liquidity levels in the system (see Chart 1). Approximately 15% of payments are already settled by 08:00 and the cumulative share of settled value increases at an almost constant pace throughout the day, with a small acceleration between 16:00 and 17:00, i.e. towards the end of the day. By 13:00 more than 50% of the payments are already settled. As Chart 1 shows, this pattern has changed only marginally through time. The APP period displays a small increase of approximately 2-3 percentage points (pp) in the portion of payments which are already settled at the beginning of the day, between 7:00 and 9:00; this small advance is smoothed out by noon. In 2018 a small deceleration of the share of turnover settled between 10:00 and 16:00, of up to 5 pp, is observed, compared with the previous years. This is compensated by an acceleration in the pace of settlement between 16:00 and 17:00.

### Chart A

Cumulative percentage of payments value settled through the day: all payment types



Note: Pre-APP refers to the period from June 2008 to February 2015; Post-APP refers to the period from March 2015 to December 2017; 2018 refers to the period from January 2018 to December 2018. The underlying data include all payment categories, except 0.0 and 4.4. Percentages displayed at hour h refer to all payments settled between h and h+1.

Differences in the intraday settlement pattern between different time periods become more obvious across the various payment types, although a common trend cannot be identified. Customer and central bank payments are settled earlier in the day in 2018, and in the APP period overall, compared with the pre-APP period (see Charts 2a and 2c). While, for customer payments, this difference is hardly noticeable, fluctuating between 2 and 5 percentage points (pp), for central bank payments the difference can go up to 17 pp. A significantly larger share of central bank transactions is already settled in the first hour of the day, and this difference persists through the day until 17:00. The difference arises from normal, regular payments from commercial banks to central banks. By noon approximately 70% of the central bank payments are already settled and the pace of the increase in the value settled is approximately constant throughout the day. The latter observation represents another differentiation with respect to the pre-APP period, when between 16:00 and 18:00 approximately 25% of the payments would be settled. This behaviour was driven by overnight deposits transfers made towards the end of the day.

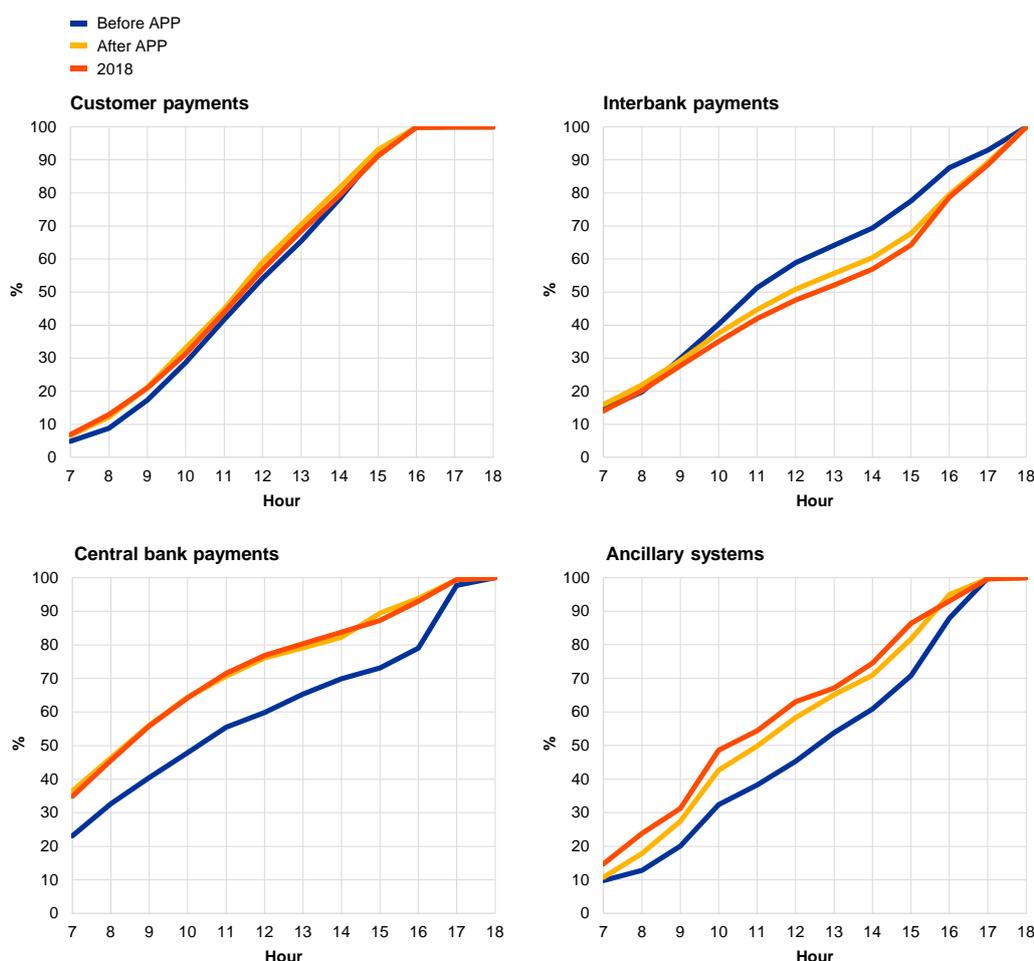
The settlement of interbank payments slowed down from the late hours of the morning in the post-APP period, and in 2018 this pattern has been even more accentuated (see Chart B1). The difference can go up to 10 pp through the day. To give the reader a flavour, while before the APP more than 50% of transactions (in value) were settled before noon, in the period from March 2015 to 2017

they were settled by 13:00 and in 2018 by 14:00. While this is of limited concern when liquidity levels are abundant, it would need to be closely monitored should central bank liquidity levels start to fall.

A change in the settlement pattern is also seen for ancillary system payments, starting with the APP (see Chart 2d). After 2015 and especially in 2018, a significant part of ancillary system payments shifted to earlier in the day. This change should be seen primarily as a direct consequence of a change in the market infrastructure, more precisely the launch of T2S (i.e. the common platform for securities settlement offered by the Eurosystem). Starting from 2015 up until the end of 2018, central securities depositories (CSDs) from 21 European markets joined T2S, bringing about a significant shift of ancillary system traffic related to securities settlement from TARGET2 to T2S. Moreover, when adding T2S payments to the ancillary system payments, payment patterns have become much more similar across the different time periods. Currently, more than 60% of the payments are settled before 13:00.

## Chart B

Cumulative percentage of payments value settled through the day by payment type



Note: Pre-APP refers to the period from June 2008 to February 2015; Post-APP refers to the period from March 2015 to December 2017; 2018 refers to the period from January 2018 to December 2018. The underlying data of Chart 2a include customer payments, Chart 2b interbank payments, Chart 2c central bank payments and Chart 2d ancillary system payments. Percentages displayed at hour h refer to all payments settled between h and h+1.

## 1.13 Tiering in TARGET2

Tiered participation arrangements occur in a payment system when a direct participant of that system provides services that allow other participants to access the system indirectly. The indirectly connected participants in turn benefit from the clearing and settlement facilities services offered by direct participants.

While indirectly connected parties, i.e. indirect participants and addressable BIC holders, benefit from the settlement facility that would be otherwise costly to access directly, these types of arrangement also entail risks. Tiered participation arrangements can create dependencies that may lead to overall credit, liquidity or operational risks for the payment system, its participants or the stability of the banking system. Close monitoring of the tiering level in TARGET2 is thus of paramount importance. It is also an oversight requirement of Article 17 of the SIPS Regulation.<sup>25</sup>

During 2018 the aggregate level of tiering on the sending side in TARGET2 reached around 5.7% in terms of value and 21.1% in terms of volume (see Chart 23). This meant that, on average, out of every euro sent by direct participants in TARGET2 during the year, only 5.7 cents were settled on behalf of indirectly connected parties outside their banking group perimeter. More than 75% of the tiered business (consolidated at banking group level) comes from outside the EEA, showing that TARGET2 makes it possible for institutions around the world to access the euro market.

### TARGET2 transfers based on the originator and final beneficiary banks' locations

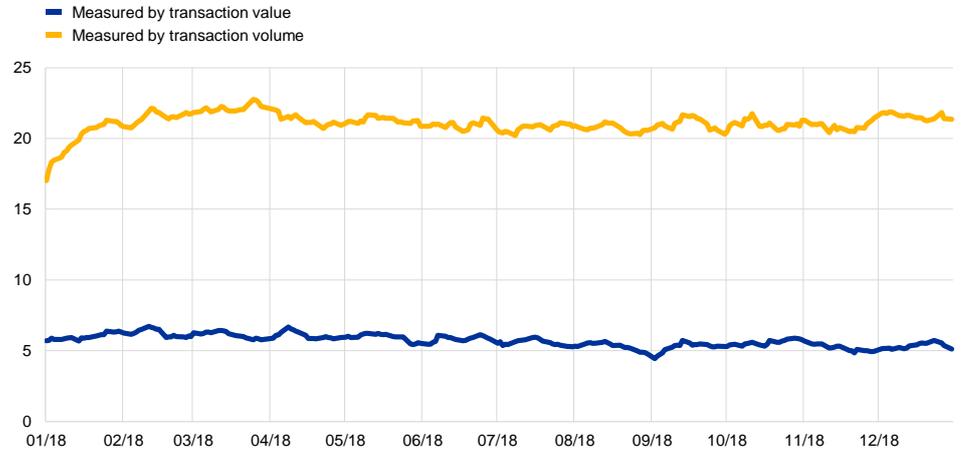


<sup>25</sup> Regulation of the European Central Bank (EU) No 795/2014 of 3 July 2014 on oversight requirements for systemically important payment systems (ECB/2014/28).

### Chart 23

#### Tiering by sender in TARGET2 in 2018

(in percentages; ten-day moving average)



The largest indirect participant in terms of value sent (consolidated at banking group level) was ranked at around 54th out of all TARGET2 direct participants in 2018.

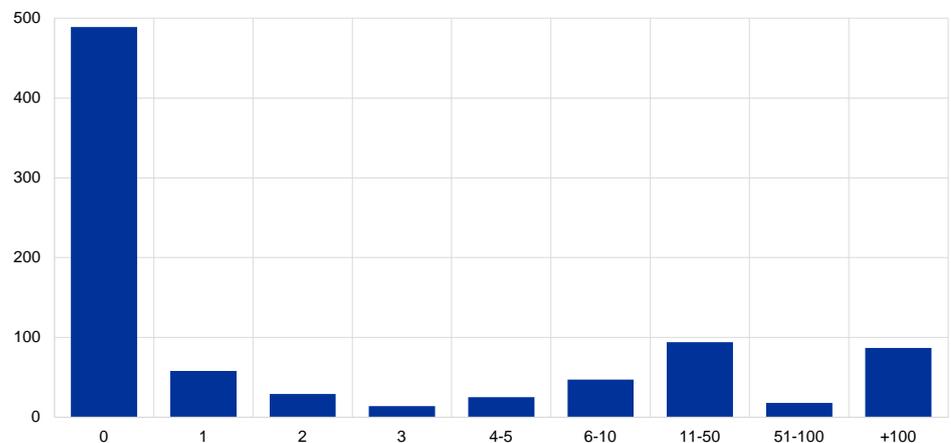
Further analysis reveals that 57% of all direct participants in TARGET2 (consolidated at banking group level) did not conduct any business during the year on behalf of indirect parties. Overall, these statistics for 2018 point to a relatively contained level of tiered participation in TARGET2.

In more detail, Chart 24 shows that around 489 direct participants do not send or receive any tiered payments and 58 send or receive payments on behalf of only one tiered banking group. At the other end of the spectrum, around 87 direct participants act as a settlement bank for more than 100 tiered banking groups.

### Chart 24

#### Tiered groups per direct participant group

(x-axis: tiered participants; y-axis: direct participants)



## 1.14 Money market transactions in TARGET2

Market participants use TARGET2 for settling unsecured money market transactions in central bank money. By applying the Furfine algorithm<sup>26</sup> it is possible to identify which TARGET2 transactions are related to money market loans, or, more precisely, to the unsecured overnight money market.<sup>27</sup> This unique dataset is updated regularly to obtain the latest information about the money market. Overall, TARGET2 transaction data provide a rich source of information for both the analysis of monetary policy implementation and TARGET2 operations. The importance of the money market is thus twofold: (i) it is an important vehicle for the redistribution of liquidity among TARGET2 participants and (ii) it is a large-value and time-critical area of business that the operator needs to be aware of, in particular when dealing with abnormal situations.

The dataset is developed using the TARGET2 simulator environment and comprises data from June 2008 onwards.<sup>28</sup> In 2018, around 27,000 money market loans with a total value of about €2.1 trillion were identified. Overall, the amount of unsecured funds traded in the overnight market during 2018 continued to fall (see Chart 25). This fall can be attributed to the increase in overall excess liquidity within the Eurosystem, and non-standard monetary policy instruments.

**Chart 25**  
Unsecured overnight money market activity in TARGET2

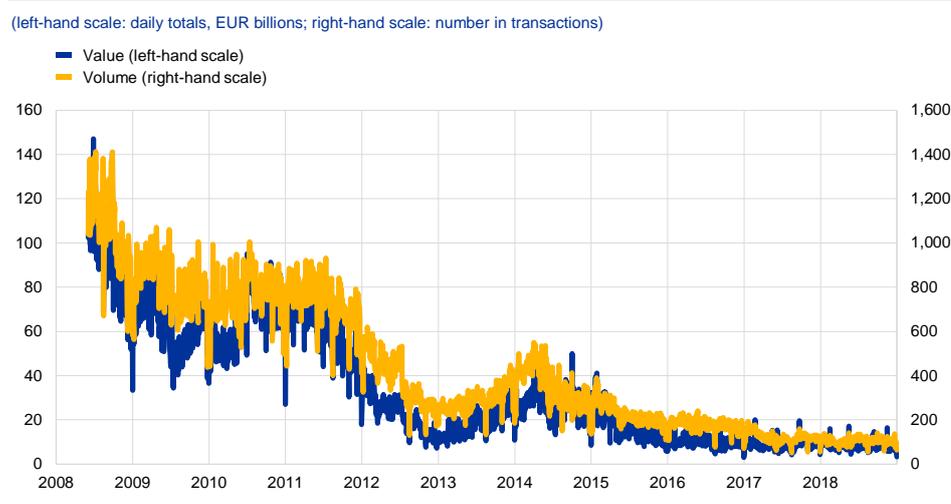


Chart 26 complements this analysis by showing the cumulative distribution in value of all money market transactions across the day in 2018. Regarding the lending leg, 50% of the total value is settled by around 15:15, while 98% is settled by around 17:00. This confirms the assumption that the last hours of TARGET2 operations are particularly

<sup>26</sup> For further information, see Frutos, J., Garcia-de-Andoain, C., Heider, F. and Papsdorf, P., “[Stressed interbank markets: evidence from the European financial and sovereign debt crisis](#)”, *ECB Working Paper*, No 1925, June 2016.

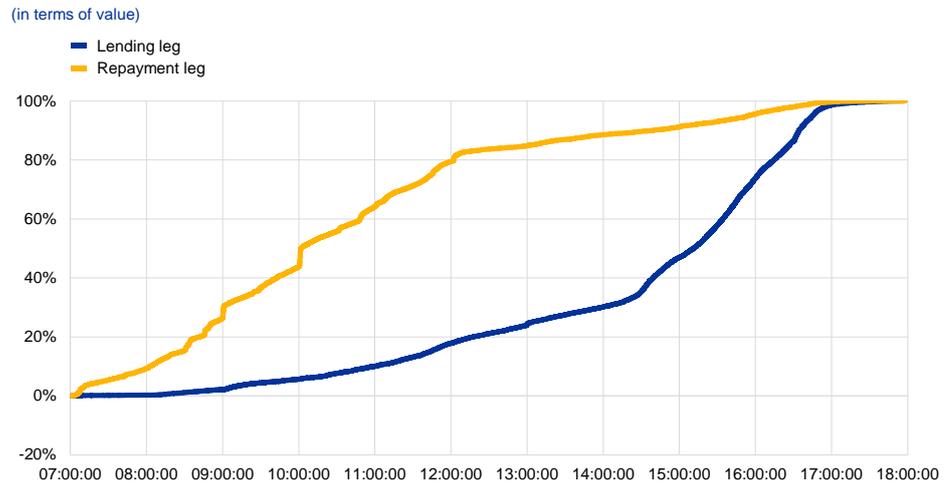
<sup>27</sup> For further information, see the box entitled “[The usefulness of TARGET2 transaction data for the analysis of the unsecured overnight money market](#)”, *Economic Bulletin*, Issue 6, ECB, 2015

<sup>28</sup> See Box 2 in the [TARGET Annual Report 2013](#).

important for the interbank market. In terms of repayment, three-quarters of the loans are repaid by around 11:45 and 90% by around 14:45. These patterns ensure that the repaid liquidity can be reused for payment purposes later that day.

**Chart 26**

Cumulative distribution of money market transactions during the day in 2018

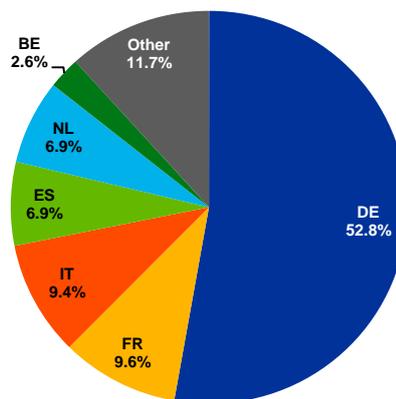


**1.15 Shares of national banking communities**

The following two charts break down TARGET2 volumes and turnover according to the share of the biggest national banking communities contributing to its traffic.

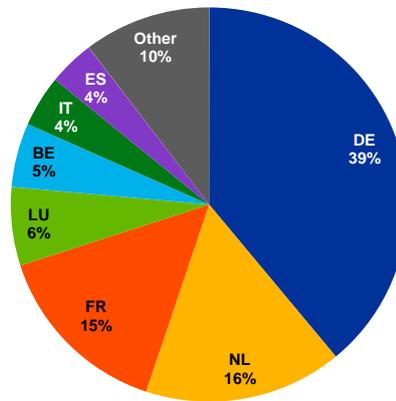
**Chart 27**

Country contribution to TARGET2 volume



**Chart 28**

Country contribution to TARGET2 value



In terms of volume, in 2018, similarly to previous years, the largest contributor to TARGET2 traffic was Germany, which accounted for more than half of the transactions settled in the system. Adding France, Italy, Spain, the Netherlands and Belgium, the share of transactions increases to 88%, which is also on a par with previous years. The shares of the biggest contributors to the TARGET2 volume changed as, in comparison with previous years, significantly lower volumes were recorded in Spain owing to the migration to T2S of the Spanish securities settlement system at the end of 2017. As regards turnover, Germany is the main contributor, followed by the Netherlands, France and Luxembourg. The top four countries by turnover generated three-quarters of the total value settled in TARGET2 in 2018. The concentration of turnover has changed slightly compared with the year before, owing also to the reduced Spanish share, by 2.5 percentage points.

It should be noted that the high concentration of both TARGET2 values and volumes in certain countries is not only the result of the size of particular markets. It can also be attributed to the fact that, since November 2007, the TARGET2 system has allowed the activities of banking groups to be consolidated around a single RTGS account held by the group's head office, thereby increasing the concentration in countries where a large number of these groups are incorporated.

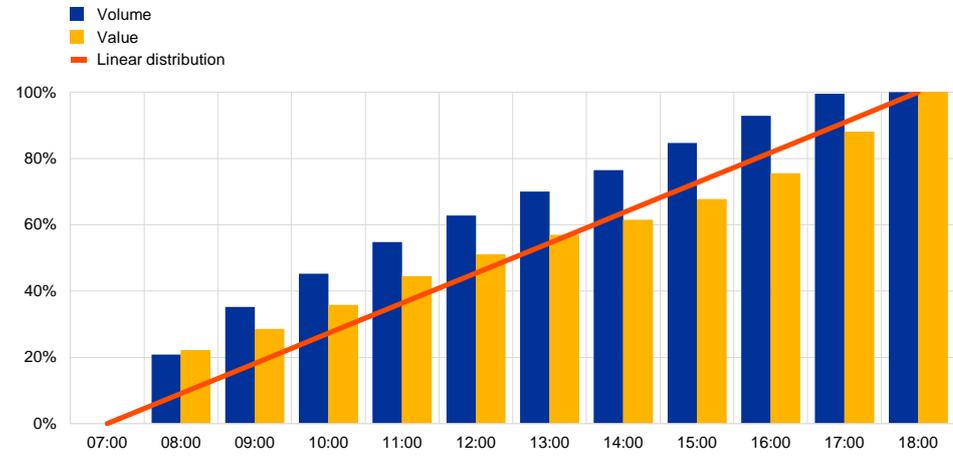
## 1.16 Pattern of intraday flows

Chart 29 shows the intraday distribution of TARGET2 traffic, i.e. the percentage of daily volumes and values processed at different times of the day in 2018. This indicator is an important one for the operator of TARGET2 as it represents the extent to which settlement is evenly spread throughout the day or concentrated at certain peak times. Ideally, the value/volume distribution should be as close as possible to a linear distribution to avoid liquidity and operational risk.

## Chart 29

### Intraday distribution of TARGET2 traffic in 2018

(x-axis: time of the day; y-axis: percentage of daily volumes and values)



In terms of value, the path is typically very close to a linear distribution, indicating an even spread throughout the day, which in turn ensures the smooth settlement of TARGET2 transactions.

In terms of volume, the curve is well above the linear distribution, with around one-quarter of transactions being submitted to the system within one hour after the start of operations – which includes transactions sent during the night by participants and warehouse payments – and almost half within three hours after the start. By one hour before the system closes, almost 100% of the TARGET2 volume has already been processed. A comparison with previous years shows no significant deviations.

## 2 TARGET2 service level and availability

In 2018, as in the preceding year, all payments settled in the payments module of TARGET2 were processed in less than five minutes.

Compared with the period before 2017, the figure improved as regards delivery of the service and processing times of payments, confirming the high performance level of TARGET2's SSP. It should be noted that this excellent performance is very advantageous for the banking community, and in particular for their real-time liquidity management.

Payment processing times are measured for all the payments settled in TARGET2, with the exception of ancillary system settlement transactions using the ASI, payments settled in the first hour of operations (see below on the "morning queue effect") and payments that were not settled because of a lack of funds or a limit breach. In practice, around 30% of all TARGET2 payments fall into these three categories of exceptions, meaning that the statistics on processing times apply to around 70% of the system's traffic.

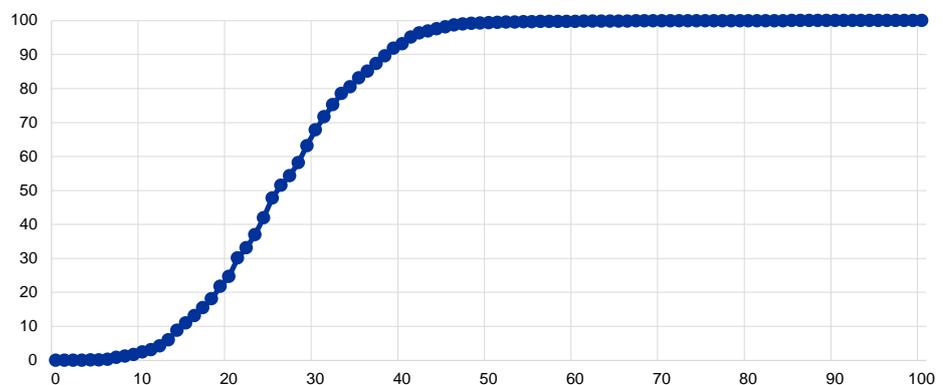
With regard to requests or enquiries, 99.90%<sup>29</sup> were processed in less than one minute and only 0.10% in one to three minutes, thus remaining at levels similar to those of 2017.

Chart 30 helps to better quantify the system's performance by showing the distribution of processing times on the SSP, i.e. the percentage of traffic with a processing time below a certain number of seconds. The reference point taken is the peak day of the year recorded by the SSP, 3 April 2018, when 591,010 payments were settled. The chart shows that, on this day, 50% of the transactions were settled within 26 seconds and 90% within 39 seconds, thereby confirming the system's high performance level.

### Chart 30

#### Processing times on 3 April 2018, excluding first hour

(x-axis: seconds ; y-axis: percentage)



<sup>29</sup> This figure covers the InterAct messages received by the SSP, in both U2A and A2A mode.

A specific phenomenon is worth reporting in the context of TARGET2 performance: the “morning queue effect”. When TARGET2 starts daylight operations at 07:00, a very high number of transactions (about 20% of the daily volume on peak days) are already waiting for settlement, corresponding either to payments submitted by banks on previous days with a future value date (i.e. “warehoused payments”) or to payments released by banks via SWIFT in the hours preceding the opening of the system. On peak days, more than 100,000 transactions may be processed in the first hour, which affects the average settlement time during this period. This huge volume of transactions normally takes around 30 to 45 minutes to be processed. In order to neutralise this effect, the first hour of operations is excluded when the TARGET2 processing times are calculated.

Specifically in the first hour, the use of urgency flags (“urgent” and “highly urgent”) is still highly recommended for payments considered as time-critical (such as CLS pay-ins). Using urgency flags circumvents settlement delays by using different queues (one queue for each type of priority). In addition, attention should be drawn to the possibilities offered in TARGET2 to reserve funds for highly urgent and urgent payments (see Section 1.8 The use of prioritisation).

## 2.1 Technical availability

In the light of TARGET2’s importance for the functioning of the financial system and the knock-on effects that any potential malfunctions could have on other market infrastructures, the Eurosystem pays particular attention to ensuring its smooth operation. This is clearly underlined by the fact that the SSP of TARGET2 achieved 99.98%<sup>30</sup> technical availability over the last reporting period, i.e. slightly lower than in 2017, when the availability of TARGET2 was 100%.

Technical availability is measured on TARGET2 business days during the day trade phase (including end-of-day processing), from Monday to Friday between 07:00 and 18:45 (19:00 on the last day of the minimum reserve period), including extensions required to complete the operational day (e.g. delayed closing owing to a technical problem in TARGET2 or in T2S, which has an effect on TARGET2, or to major problems in ancillary systems settling in TARGET2). The availability measurement does not include systems or networks not directly managed by TARGET2 (in particular, the availability of the SWIFTNet services). Incidents occurring during night-time settlement are not included either.

Technical availability is not intended to measure the impact of partial outages involving TARGET2’s SSP. For example, incidents affecting only the processing of ancillary system transactions without any effect on other payment processing activities cannot be measured within this figure, although they have an overall impact on TARGET2 and are taken into account when assessing the system’s performance. However, such incidents are, where applicable, considered when measuring processing times and, in addition, reported transparently and followed up accordingly.

<sup>30</sup> SSP availability in 2018 was affected by one incident that occurred in November 2018 (see Section 2.2).

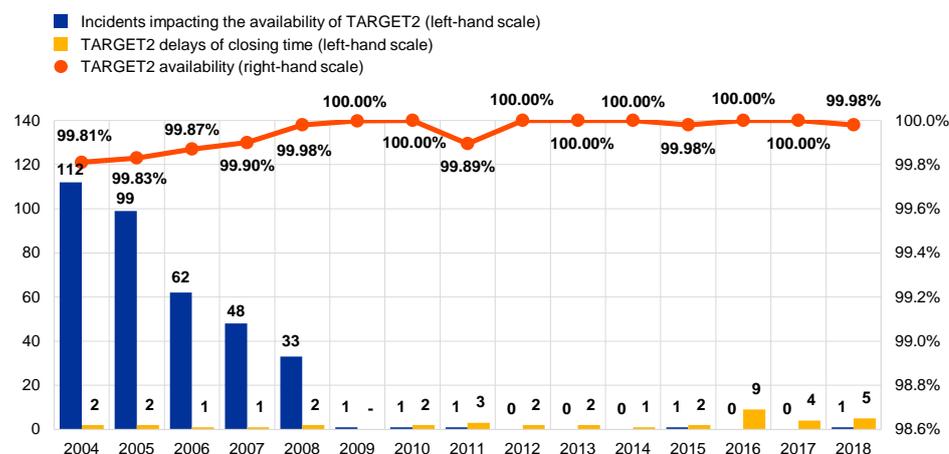
## 2.2 Incidents in TARGET2

The ECB publishes up-to-date information about the availability of TARGET2 via the Market Information Dissemination tool. All incidents relating to TARGET2 are followed up with a detailed incident report and risk management process. The aim of this approach is to learn from these events in order to avoid a reoccurrence of the incidents or incidents of a similar nature.

**Chart 31**

### TARGET2 incidents and delays in closing the system

(left-hand scale: number of incidents/delays; right-hand scale: yearly data in percentages)



In 2018 TARGET2 experienced some issues which, in one case, partly affected transaction processing. Owing to this incident, the overall TARGET2 availability indicator was slightly lower than in the previous year. Caused by a technical failure following the implementation of a new SSP release, the incident occurred on 19 November and impacted settlement processing for around 40 minutes. Two other major incidents, which did not impact the availability of TARGET2 but led to some disturbances in its functioning, occurred in March and October 2018. In both cases the incidents occurred during a night-time phase and affected the processing of ancillary system files. The root causes of these incidents were identified and corrective measures have been or will be implemented in order to prevent any reoccurrences.

In addition to this incident and some other less significant issues affecting TARGET2 operations on a few occasions, the closing of interbank payment cut-off at 18:00 was delayed five times in 2018<sup>31</sup> due to problems related to the repatriation of funds from T2S back to TARGET2 RTGS accounts.

<sup>31</sup> On 27 April, 2 October, 27 November and 11 and 27 December.

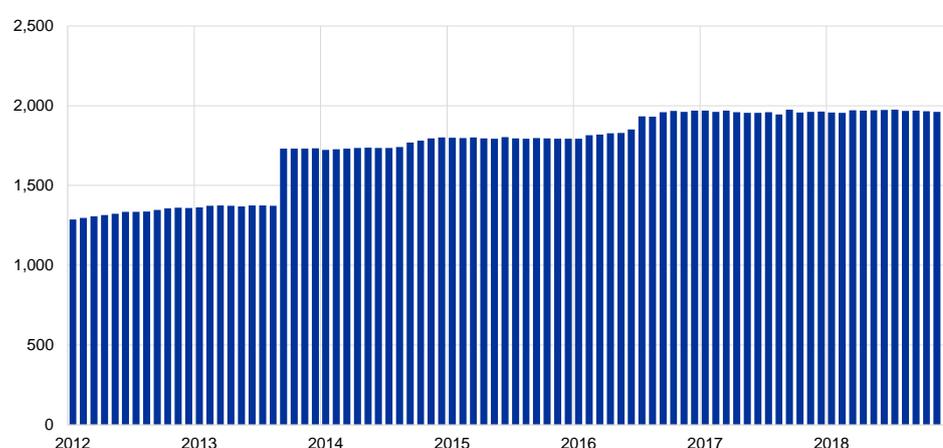
## 3 TARGET2 participants

### 3.1 RTGS accounts

In December 2018 the total number of RTGS accounts active in TARGET2 (encompassing the direct participants, the technical accounts, the ancillary system accounts and the special-purpose accounts) was 1,968, i.e. largely unchanged from the end of 2017.

#### Chart 32

Number of RTGS accounts in TARGET2

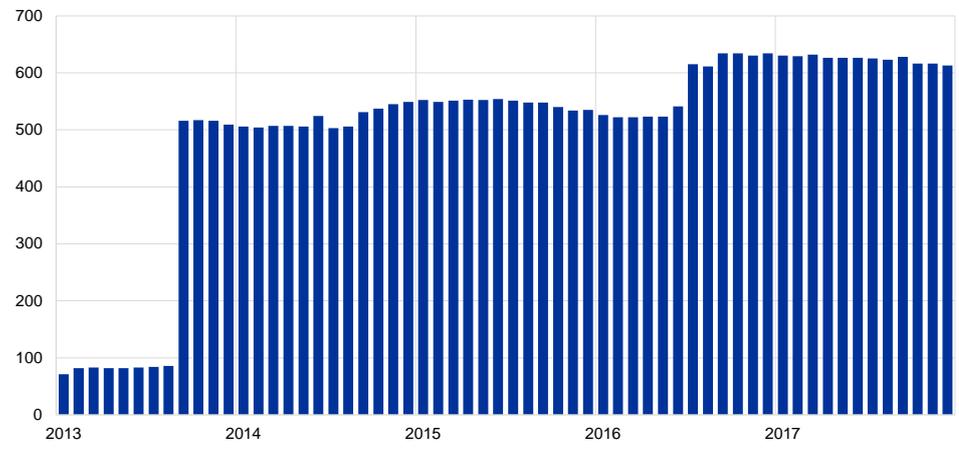


#### Internet-based participation

In November 2010 internet-based participation was introduced to allow small banks to obtain a direct connection to TARGET2 without necessarily being connected to the SWIFT network. The service, which is subject to a monthly fee of €70, is designed mainly for low-volume participants who wish to hold an account directly with their central bank: either an RTGS account<sup>32</sup> or a home accounting module account (provided the respective central bank opted for this module). While the initial number of internet-based participants was relatively modest (68 at the end of 2012), it increased significantly in 2013 (reaching 509 participants at the end of 2013) with the phasing out of the last proprietary home accounts still offering payment settlement services. In December 2018 the overall number of internet-based participants was 594, 3% fewer than at the end of 2017. The largest share of internet-based participants is in Germany, followed by France and Italy.

<sup>32</sup> An RTGS account for an internet-based participant will also incur additional monthly fees for the account itself and a flat rate fee of €0.80 per transaction.

**Chart 33**  
Internet-based participants



## 3.2 Participation types

At the end of December 2018, 1,056<sup>33</sup> direct participants held an account on the SSP of TARGET2 and were registered as such in the TARGET2 directory. Through these direct participants, 659 indirect participants from the EEA were able to settle their transactions in TARGET2, as well as 4,091 correspondents worldwide.

**Table 2**  
Participation types

|   |        |
|---|--------|
| Direct participation  | 1,056  |
| Indirect participation  | 659    |
| Multi-addressee – Credit institution  | 28     |
| Multi-addressee – Branch of direct participant  | 1,279  |
| Addressable BIC – Correspondent (including CB Customers)                                  | 4,091  |
| Addressable BIC – Branch of Direct participant or entity that is part of the same group   | 33,024 |
| Addressable BIC – Branch of Indirect participant or entity that is part of the same group | 1,317  |
| Addressable BIC – Branch of Correspondent or entity that is part of the same group        | 7,827  |

Including the branches of direct and indirect participants, a total of 49,281 BICs around the world (80% of which are located in the EEA) were accessible via TARGET2 at the end of 2018. Compared with the number of reachable BICs at the end of 2018, this figure represents a drop of around 4%, driven mainly by the decrease in the number of addressable BIC holders associated with branches of direct and indirect participants.

<sup>33</sup> This figure represents the number of direct participants with at least one account in TARGET2. Direct participants may have more than one account, which is why the figure is lower than the number of RTGS accounts as reported under Section 3.1.

Participants and institutions addressable via TARGET2 are listed in the TARGET2 directory, which is available to all direct participants for information and routing purposes. In addition to the direct participants that hold an RTGS account for sending payments to and receiving payments from all other direct participants, a number of banks have opted for the opening of special-purpose RTGS accounts, which are not reported as direct participants in the TARGET2 directory. These special-purpose accounts are used, for instance, for the settlement of a specific business, e.g. securities settlement, Eurosystem open market operations, or to fulfil reserve obligations in countries where reserves are computed on RTGS accounts. There were 550 of these accounts, also called “unpublished BICs”, at the end of 2018 (567 in 2017).

### Box 3

#### Implications of Brexit for TARGET2

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The TARGET2 Guideline, which sets the eligibility criteria for accessing the TARGET2 system, provides for the direct connection of supervised credit institutions established in the Union or the EEA, including when they act through a branch. When it comes to credit institutions established outside the EEA, the Guideline makes it possible for them to connect to the system through a branch established in the Union or the EEA, subject to the provision of a country opinion (cf Art 4 and 8 of Annex II).

The prospect of Brexit has prompted British institutions that currently access TARGET2 directly via a euro area NCB (i.e. remote access) to find alternative ways to connect. At the end of 2018, some 39 UK-based participants had direct access to seven national component systems of TARGET2. As part of their preparation for Brexit, these institutions were presented with a number of options with respect to their TARGET2 participation, as follows:

- Use or establish a subsidiary in the EEA from which they can conduct their euro payment business. From a TARGET2 perspective, those credit institutions would be seen as regular banks, established in a euro area country, that hold an account with a euro area NCB.
- Use or establish a branch in the EEA from which they can conduct their euro payment business. The direct participation of such entities would nevertheless require the provision of a conclusive country opinion.
- Terminate their direct participation in TARGET2 and have recourse to the service of another direct participant for sending or receiving euro payments on their behalf (i.e. becoming an addressable BIC holder). In contrast to direct access, any of the direct participant’s customers can become an addressable BIC holder as there are no specific territorial or administrable criteria.

The most significant UK-based participants have meanwhile confirmed that they have taken all necessary measures to maintain their access to TARGET2, which will preserve the smooth functioning of TARGET2 under any Brexit scenario.

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## 3.3 Ancillary systems

At the end of 2018 a total of 85 ancillary systems were settling on the TARGET2 SSP, including 31 retail payment systems, 21 securities settlement systems and 23 clearing houses (including four CCPs) and others. These figures are slightly higher than in 2017, mainly owing to new retail payment systems joining TARGET2 in order to use the new ASI 6 real-time procedure to support the settlement of instant payments (see Box 3 for more details). Additionally it should be noted that, despite the migration of many securities settlement systems to T2S, the number of ancillary systems participating in TARGET2 is relatively stable, due mainly to the fact that the systems that migrated to T2S left a portion of their activities in TARGET2 (e.g. non-securities settlement-related activity, such as processing of corporate actions, issuance services, repo transactions or transactions specific to the local market).

**Table 3**  
ASI settlement model

| ASI settlement model                           | Usage <sup>1</sup> |
|--|--------------------|
| Model 1 – Liquidity transfer                   | 0                  |
| Model 2 – Real-time settlement                 | 19                 |
| Model 3 – Bilateral settlement                 | 14                 |
| Model 4 – Standard multilateral settlement     | 17                 |
| Model 5 – Simultaneous multilateral settlement | 13                 |
| Model 6 – Interfaced                           | 16                 |
| Model 6 – Real-time                            | 8                  |

1) An ancillary system may make use of more than one ASI settlement model.

Out of the 85 ancillary systems settling on the SSP, 58 made use of the ASI, a feature which was developed to facilitate and harmonise the cash settlement of these systems in TARGET2 (the other ancillary systems use the Participant Interface, which was developed mainly for the participants, i.e. financial institutions). The number of times each of the six available ASI models was used at the end of the year is shown in Table 3. As a result of the migration to T2S, model 1 (which supports the integrated model) is no longer used.

### Box 4

#### Dedicated liquidity for ASI settlement procedure 6 real-time

TARGET2 offers participants the possibility of setting aside (“dedicating”) part of their available liquidity in:

1. Dedicated Cash Accounts (DCAs) for settlement in T2S and TIPS (the latter as of end-November 2018);
2. Sub-accounts dedicated to specific ancillary systems (ASI settlement procedure 6 interfaced);
3. Technical accounts managed by ancillary systems (ASI settlement procedure 6 real-time).

This means that the dedicated liquidity cannot be used for other settlement purposes. In TARGET2, the overall available liquidity amounted to a total of €1.8 trillion on average at start-of-day in 2018.

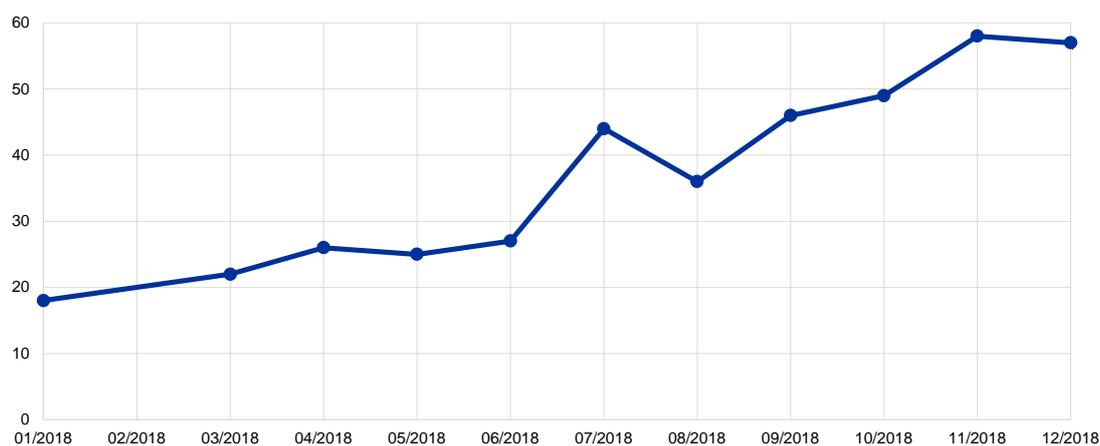
The ASI settlement procedure 6 real-time (hereinafter ASI 6 real-time) was introduced with release 11.0 in November 2017 to support automated clearing houses (ACHs) in processing instant payments. Via this procedure, settlement banks can manage their positions by funding and defunding the technical accounts of the ACHs they participate in. It also provides cross-system settlement capabilities to support interoperability among ACHs.

Chart A shows the monthly evolution of the number of active settlement banks<sup>34</sup> across all ACHs using ASI 6 real-time in TARGET2 in 2018. With six ACHs connected as of end-2018, the number of active settlement banks increased from 18 in January to 57 in December as new ACHs joined the procedure and new settlement banks joined the connected ACHs.

### Chart A

#### Active settlement banks in 2018

(number of settlement agents)



Note: Calculations are at BIC11 level. If one settlement bank participates in more than one ACH, it is counted each time.

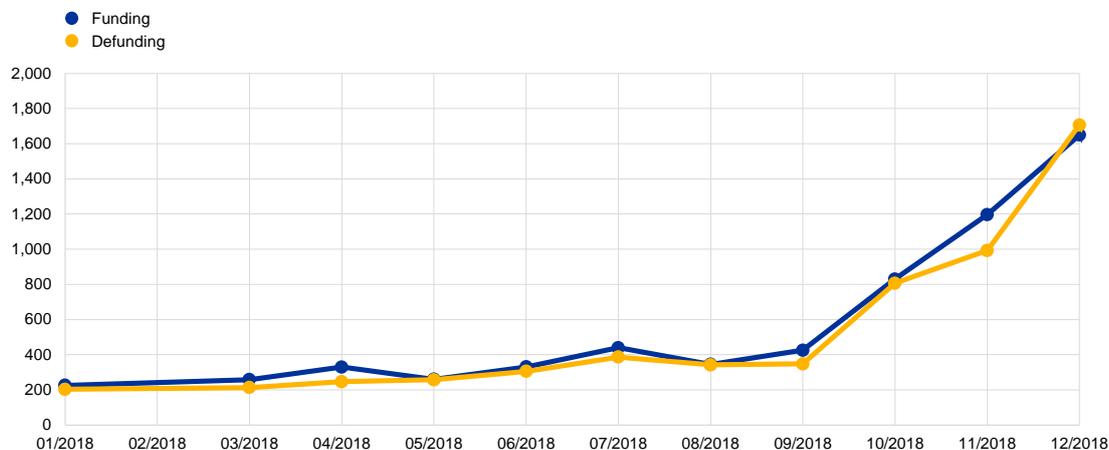
Chart B shows the monthly funding and defunding of ASI 6 real-time in value terms in 2018. The sum of all the liquidity pushed from the accounts of settlement banks to the technical accounts of the ACHs (i.e. the funding transactions) increased from €225.7 million in January to €1.6 billion in December 2018. This is to be compared with the sum of the liquidity brought back to the accounts of settlement banks (i.e. the defunding transactions), which also increased from €203.3 million in January to €1.7 billion in December 2018. Funding and defunding reached a peak in December 2018.

<sup>34</sup> While the settlement members of ACHs may be of different types, in TARGET2 the ASI terminology refers to settlement banks and this terminology is adopted here too.

## Chart B

### Value of traffic in 2018

(EUR million)



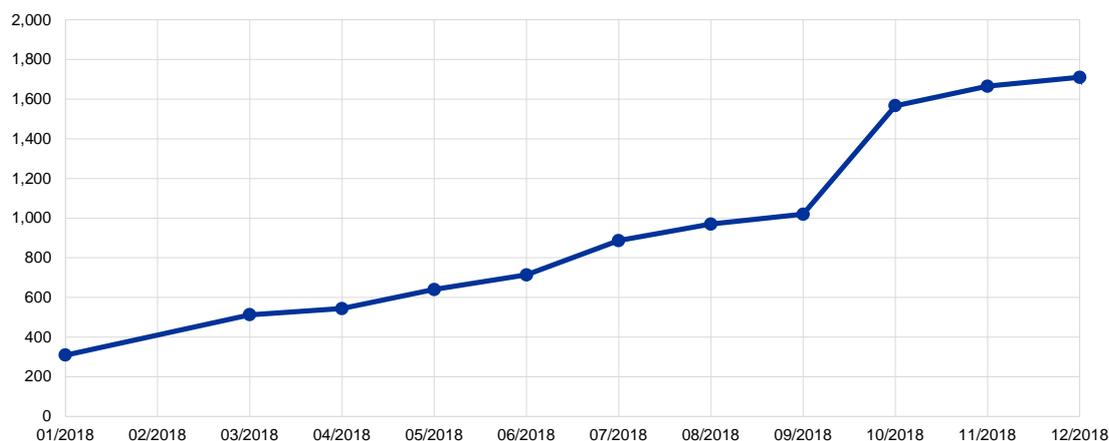
The dynamics of funding and defunding the technical accounts lead to the creation of net positions, which can be calculated on a monthly basis. In particular, when funding was higher than defunding, liquidity accumulated on the technical accounts.

Chart C shows the monthly traffic of ASI 6 real-time in volume terms in 2018. The total volume is calculated as the sum of all funding and defunding transactions. Traffic steadily increased in 2018, with monthly volumes growing from 309 in January to 1,710 in December. The latter figure also represented the peak in the series.

## Chart C

### Volume of traffic in 2018

(number of transactions)



Combined with the values shown in Chart B, the average transfer value fell from €1.4 million in January to €0.7 million in August 2018, whereas from August onward it steadily increased, reaching a peak of €2.0 million in December 2018.

As one of the forms of liquidity dedication available to TARGET2 participants, ASI 6 real-time was introduced to support the processing of instant payments. Overall, the calculated figures for 2018 show an increase in the usage of this settlement procedure, indicating a gradual uptake of instant payments in the market.

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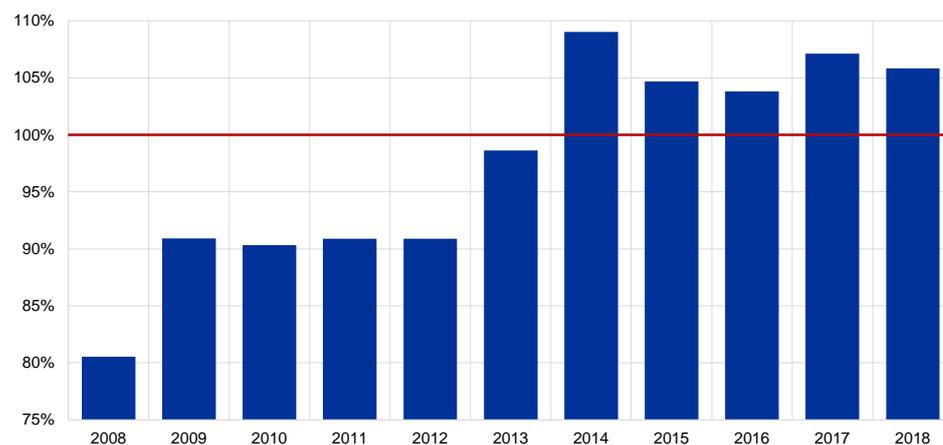
## 4 TARGET2 financial performance

### 4.1 Cost recovery objectives

The objective initially set by the ECB Governing Council in 2007 was that TARGET2 should recover all costs (with the exception of the “public good factor”<sup>35</sup>) over the six-year amortisation period, i.e. between May 2008 and April 2014. This covers its development costs, running costs, overhead costs and capital costs.

The evolution of TARGET2’s cost recovery rate since the finalisation of its migration phase in 2008 is shown in Chart 34 below.

**Chart 34**  
TARGET2 annual cost recovery



\* 2008: only July-December

At the time of TARGET2’s development, a number of assumptions were made regarding the volume of operations when considering cost recovery. It was estimated that in the first year of operations (i.e. from May 2008 to April 2009), TARGET2 would settle a total of 93.05 million transactions and that this figure would then have to increase by an average of 6% per year. While the objective was met in the year the system was launched, the overall economic slowdown and exceptional market conditions in the following years made it impossible to meet the target 6% increase. Since TARGET2’s launch, the system has seen an average annual decrease in billed traffic of 0.9%. This largely explains why cost recovery, for the first few years of operation, was only around 90%.

In July 2012, acknowledging this underperformance, the Eurosystem decided to amend the single pricing scheme of TARGET2 as of January 2013. The fixed periodic

<sup>35</sup> For further considerations on the public good factor please see ECB Working Paper Series Nos 505, 506 and 507 published in July 2005. A special study group analysed various issues relevant for the design of TARGET2. Following the completion of the group’s work, the ECB Working Paper Series issued a selection of published papers.

fee for users was increased, while transaction fees remained unchanged. The new pricing scheme represents an acceptable compromise, with a limited increase in the participants' fees and a reasonable extension of the system's payback period. In 2013 the amended pricing scheme helped to bring cost recovery close to 100%.

In 2014 the majority<sup>36</sup> of the investment costs were amortised, which substantially reduced the costs still to be recovered. This lifted cost recovery to more than 100%. These annual profits are used to offset the losses accumulated over the first years of operation.

While TARGET2 has generated annual profits since 2014, the level of cost recovery has fluctuated considerably on an annual basis. The reasons for this are, first, the SEPA migration end-date resulted in a one-off drop in the total amount of customer payments settled in TARGET2. Second, T2S migration had an effect on TARGET2 from both a cost and a revenue perspective. TARGET2 underwent adaptations in preparation for the launch of T2S, the costs of which started to be recouped from 2015 onwards. These adaptation costs are passed on to system participants in the form of a specific fee.<sup>37</sup> Furthermore, the successful migration of the respective CSDs to T2S from June 2015 onwards reduced the total amount of ancillary system transactions settled in TARGET2.

The total amount of billable traffic in TARGET2 fell by 0.9 million in 2018. However, overall revenues increased to €45.3 million, thanks to the fees for T2S-related services with the completion of the migration to T2S. Overall, the annual cost recovery fell slightly, to 105.8%, in 2018, as compared with 107.1% in 2017.

## 4.2 Financial performance of TARGET2 in 2018

In 2018 the total annual costs to be recovered for the provision of the core services of TARGET2 amounted to €42.8 million. On the revenue side, TARGET2 participants were billed for 86.1 million transactions, which together with the fixed monthly fees generated total revenues of €45.3 million. This resulted in a cost recovery rate of 105.8% and an annual profit of €2.5 million. At the end of 2018, the loss accumulated since the launch of TARGET2 had therefore decreased by the same amount and stood at €10.5 million.

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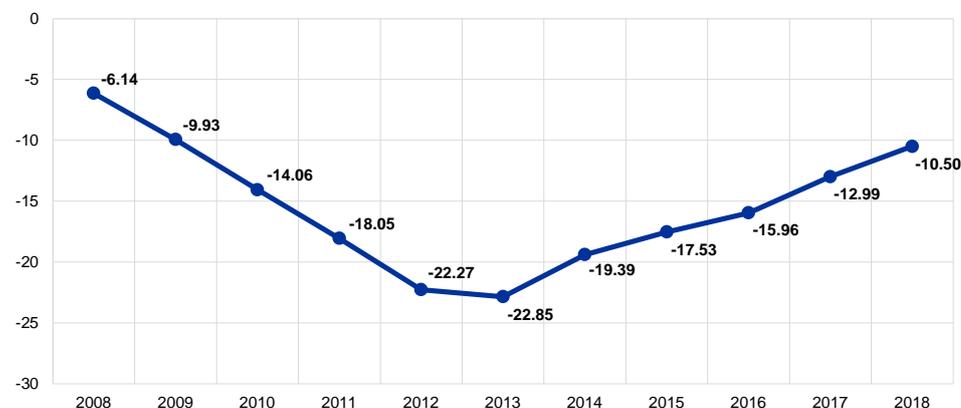
<sup>36</sup> This part corresponds to the initial development costs (i.e. release 1.0). Only the costs corresponding to the development of annual releases that have not yet been fully amortised (i.e. release 2.0 and beyond) were still to be recovered.

<sup>37</sup> In 2015 a new monthly fee was introduced for the DCAs linked to the TARGET2 RTGS accounts and for the use of the value-added services.

**Chart 35**

**Accumulated profit/loss**

(EUR millions)



\* 2008: only July-December.

## 4.3 Analysis of the revenues collected in 2018

Based on 2018 figures, the following observations can be made.

- 94% of the direct participants in the SSP opted for the flat fee option (i.e. option A), while 6% opted for the degressive fee option (i.e. option B).<sup>38</sup> This shows that TARGET2 is capable of attracting both the major market players as well as a large number of small and medium-sized institutions.
- The participants opting for pricing option B generated, in total, around 87% of the billed traffic.<sup>39</sup> As a result of this concentration effect, 29% of all billed transactions were priced at the lowest pricing band, i.e. €0.125. This demonstrates that key participants, particularly multi-country banks, benefited from the attractive degressive fee option offered by TARGET2 and from the competitive group pricing offers.<sup>40</sup>
- Transactions exchanged between credit institutions generate around 90% of TARGET2 volumes, with the remaining 10% attributable to ancillary system transactions.
- 73% of TARGET2 revenues were variable, i.e. came from transaction fees, while fixed subscription fees accounted for 27%.

<sup>38</sup> Option A (i.e. a monthly fee of €150 and a flat transaction fee of €0.80) is intended for small and medium-sized institutions submitting fewer than 8,625 TARGET2 transactions per month. For institutions making greater use of TARGET2, option B (i.e. a monthly fee of €1,875 and a degressive transaction fee of between €0.60 and €0.125) is proposed.

<sup>39</sup> These are accounted for by core pricing participants, central banks using the ASI for "other purposes", ancillary systems and liquidity pooling.

<sup>40</sup> Some specific features of TARGET2 (e.g. liquidity pooling or multi-addressee access) offer the possibility of applying the degressive transaction fee to all payments initiated from accounts belonging to the same group.

## 5 TARGET2 risk management and oversight activities

### 5.1 TARGET2 risk management

Managing information security risks is a key element of TARGET2's governance structure. In order to meet this responsibility, the Eurosystem has established a comprehensive risk management framework comprising, among other things, a fact-finding analytical part, as well as dynamic elements, to ensure that information security risks are identified in a timely manner, continuously monitored and maintained throughout the TARGET2 lifecycle.

In particular, TARGET2's risk management processes are designed to (i) monitor developments to ensure that progress on the implementation of security controls in response to issues resulting from risk assessments is satisfactory; (ii) enable those involved to learn from operational experience and thereby ensure that appropriate measures are taken to prevent an incident from reoccurring; and (iii) proactively identify new threats and vulnerabilities that could emerge from the changing environment in which the TARGET2 system operates and, if needed, initiate deliberations on the implementation of additional security controls to prevent these threats from materialising.

As regards information security and cyber resilience, in 2018 the Governing Council approved three cyber resilience enhancements (CREs) as part of the Eurosystem Action Plan on Cyber Resilience (APCR) established in 2017. These three CREs aim at further enhancing the Eurosystem's capabilities regarding the identification, detection and protection against cyber attacks, particularly in the areas of security services, security testing, data recovery and restart capabilities.

Regarding governance aspects for risk management, following a recommendation from the TARGET2 Overseer, a three-lines of defence model<sup>41</sup> was adopted. As a consequence, a market infrastructure risk coordinator was appointed to coordinate all risks for the TARGET Services (i.e. financial risks, legal risks, information security risks, etc.) vis-à-vis the MIB.

### 5.2 Oversight activities

During 2018, as part of the continuous oversight cycle, the ECB oversight function organised a number of bilateral meetings at different levels between the TARGET2 operator and the ECB as the competent authority, and at ESCB level via the joint PSOWG-WGT2 meeting. These and other meetings have helped to provide the operator with a detailed overview of the overseers' expectations and have enabled the

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<sup>41</sup> IIA's [Three Lines of defence position paper](#).

overseer to effectively monitor the system's risk profile, as well as any recent developments in the system.

As a follow-up to the comprehensive assessment of TARGET2 against the SIPS Regulation, the ECB oversight function discussed and agreed with the operator the remediation plans concerning the implementation of the measures in response to infringements and recommendations and closely monitored the progress made against them. During 2018, the overseer also engaged with the TARGET2 operator on the development of a framework for the comprehensive management of risks in TARGET2, which was one of the objectives arising from the comprehensive assessment of the system against the SIPS Regulation. All infringements except one have been remediated in line with the framework.

A major change assessment on the TIPS service was conducted by the ECB oversight function and finalised before the go-live on 30 November 2018. The assessment was based on the updated self-assessment and supporting documentation provided by the TARGET2 operator. The assessment resulted in several recommendations that will be followed up in 2019 by the ECB oversight function.

Two TARGET2 incidents occurred in 2018 (in March and in October) that were both classified as major by the ECB oversight function since the incidents led to a downtime of more than two hours in the processing of ancillary system files.

Following the publication of the CPMI strategy on endpoint security in wholesale payment systems in May 2018, the ECB oversight function organised several meetings with the TARGET2 operator to discuss a self-assessment prepared by the TARGET2 operator against the seven high-level elements of the strategy and various issues related to the endpoint security aspects that are implemented or planned to be implemented in TARGET2. The ECB oversight function will work closely with the TARGET2 operator in 2019 to identify what improvements can be made to the system to meet the seven elements contained in the strategy.

## **Box 5**

### **Enhanced Contingency Solution – ECONS I**

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In response to the dynamically changing threat landscape and to address new oversight requirements, the Eurosystem agreed in 2016 to upgrade the existing TARGET2 Contingency Module (CM). The new contingency tool, known as the Enhanced Contingency Solution (ECONS I), will be implemented with TARGET2 SSP release 13.0 in November 2019 (see Section 6 below).

ECONS I will allow the Eurosystem to cope with an extended outage of TARGET2 and support the processing of very critical transactions. In comparison with the existing CM, which was designed to handle intraday failures, ECONS I will let TARGET2 cope with incidents lasting more than one day. Moreover, the new tool will be ready for direct use by TARGET2 participants (i.e. not only via their central banks), who will be able to access the contingency component via a graphical user interface.

Initially, the connection to ECONS I will be compulsory for Eurosystem TARGET2 central banks and for TARGET2 participants classified as critical in accordance with the specified criteria as well as for those participants who are involved in the settlement of very critical payments in TARGET2. Other

TARGET2 participants and central banks outside the euro area may connect to ECONS I on a voluntary basis.

Overall, ECONS I is a part of the broader strategy to strengthen the cyber resilience of the Eurosystem market infrastructure. It will be further developed and improved in the context of the ongoing T2-T2S Consolidation project.

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## 6 System evolution

### Release 12.0 – TARGET2 adaptation to TIPS

Release 12.0 was implemented on 19 November 2018, which coincided with the go-live of the SWIFT Standards Release. The release was dedicated largely to the functional adaptations that ensure a smooth interaction with TIPS, as in the case of the adaptations required before T2S went live. The adaptations comprised the management of liquidity transfers between TARGET2 and TIPS as well as the upgrade of the optional Reserve Management and Standing Facilities modules to take account of the remuneration rules applicable to funds retained overnight in TIPS. Furthermore, the TARGET2 ICM screens were enhanced with dedicated liquidity management features that now provide participants with (i) a real-time consolidated monitoring screen encompassing TIPS accounts and (ii) the possibility of pushing/pulling liquidity between their TARGET2 accounts and TIPS accounts.

In addition, TARGET2 release 12.0 also included (i) further upgrades needed for supporting the compatibility with the SWIFT gpi, (ii) adaptations to respond to the change to the ISO 9362 standard related to BICs and (iii) the upgrade of the ISO 20022 message version for all XML messages used in TARGET2, except those related to the interaction with T2S. These are scheduled to be upgraded with the go-live of the TARGET2 release 12.1 on 27 May 2019.

### Release 13.0 – ASI 6 Real-Time enhancements

To further align the level of service offered to TIPS and ASI 6 Real-Time, the Eurosystem has endorsed enhancements to ASI 6 Real-Time. The relevant requirements were collated in a workshop which was organised with the ACHs using or planning to make use of ASI 6 real-time and two change requests are scheduled for the implementation in TARGET2 release 13.0, scheduled for deployment on 18 November 2019.

Additionally, release 13.0 will also include (i) enhancements to the ICM introducing the display of the closing balances on TIPS accounts that can be used for reserve management purposes, (ii) mandatory upgrades related to the migration from SWIFT Browse to SWIFT WebAccess and (iii) enhancements to the TARGET2 Contingency module. The latter is currently available to central banks in case of a severe incident in TARGET2 and will be upgraded in order to strengthen cyber resilience and to enhance the existing TARGET2 business continuity arrangements (Please see Box 4 for more details).

## Release 14.0

Based on the Governing Council's decision to approve the T2/T2S Consolidation project for a go-live in November 2021, the remaining lifetime of TARGET2 will be limited to only one year after the go-live of TARGET2 release 14.0. For that reason, the Eurosystem central banks have decided not to call for additional functional changes in the scope of release 14.0 and have not accepted change requests from TARGET2 participants.

Consequently, it is currently envisaged that the TARGET2 release 14.0 will contain only mandatory changes to the system and potential adaptations to SWIFT (e.g. adaptations to SWIFT Standards Release 2020).

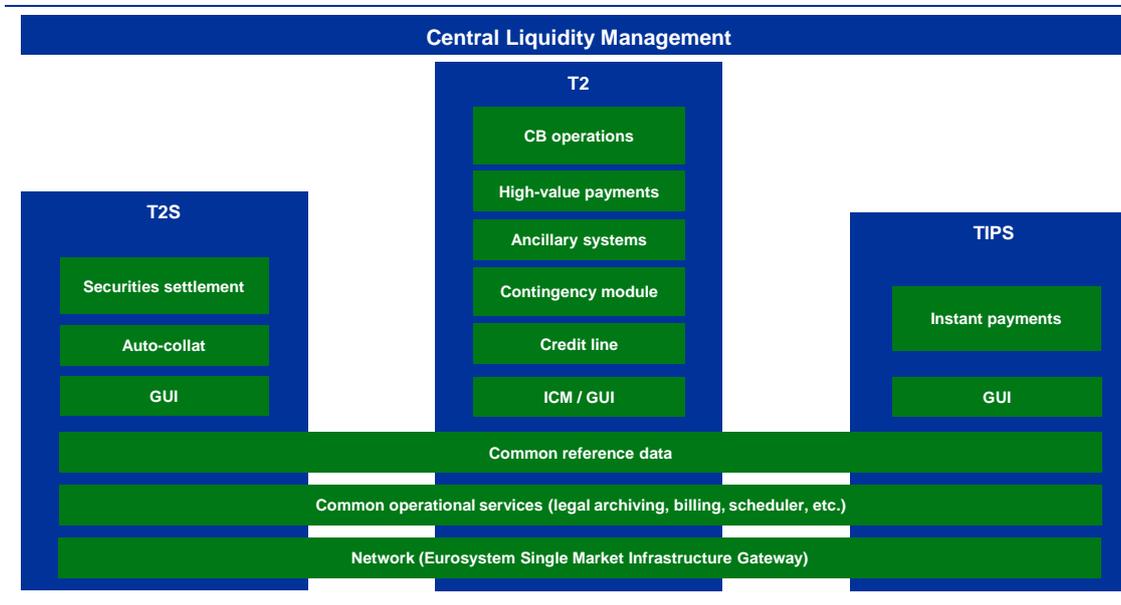
### Box 6

#### T2-T2S Consolidation advances to implementation phase

Approved by the ECB Governing Council in December 2017, the T2-T2S Consolidation project is nearing the end of its functional specification phase. The aim is to meet changing market demands by replacing the current TARGET2 with a new real-time gross settlement (RTGS) system and introducing a centralised tool for liquidity management across all TARGET Services (T2, T2S and TIPS).

#### Figure A

T2-T2S consolidated platform



#### Delivering the user documentation

The past year was critical for ensuring that market participants have all necessary technical details to start their internal assessment in preparation for the big bang migration in November 2021. The most important pieces of user documentation provided by the Eurosystem can be categorised into two groups:

- User Requirements Documents (URD), which elaborate on the user requirements for each component of the consolidation project: central liquidity management (CLM), RTGS and common components.
- User Detailed Functional Specifications (UDFS), which provide details about the functional features, the interaction between the new components and their users, and the catalogue of messages for exchanging information.

As soon as the project was officially approved, the Eurosystem published the first set of URD. They have benefited from more than 2,800 comments, from over 50 institutions, submitted during an earlier market consultation. Over the past year, the URDs were enriched with further details, which resulted in updated versions published in March and November 2018, respectively.

In November 2018, the first version of UDFS was also presented in two separate documents, covering CLM and RTGS. All interested parties were later given the opportunity to comment on an updated UDFS v1.1 during a public consultation between 21 January and 5 April 2019. The feedback collected will be incorporated into a revised version of the documents to be published in the summer of 2019.

#### **Multiple connectivity providers for the Eurosystem Single Market Infrastructure Gateway**

As part of the T2-T2S Consolidation project, the Eurosystem will offer access to all its market infrastructure services via a harmonised interface. The so-called Eurosystem Single Market Infrastructure Gateway (ESMIG) will be the entry point for all TARGET services, all common components and the Eurosystem Collateral Management System (ECMS). Users will be able to connect to ESMIG via different pre-selected network service providers.

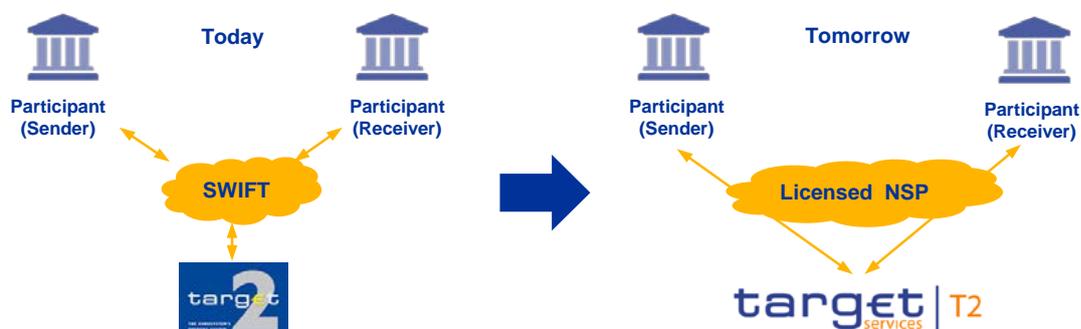
Acting on behalf of the Eurosystem, the Banca d'Italia has launched an open procedure to award up to three concessions for the provision of ESMIG connectivity services. The interested network service providers had the opportunity to submit their applications by 28 March 2019. The Eurosystem is currently evaluating their bids on the basis of the lowest price offered to market participants, provided that the applicant fulfils a minimum set of requirements. Once the concessions are awarded in mid-July 2019, the market participants will be able to initiate negotiations with the selected network service providers.

#### **Ready for a big bang migration**

The T2-T2S Consolidation project will go live in November 2021, following a big bang approach. This means that the current TARGET2 Single Shared Platform will be discontinued simultaneously with the launch of the new T2 service. Transition in stages is not possible because the current SWIFT Fin Y-copy messages used in TARGET2 cannot co-exist with the V-shape messages that will be employed for the new T2 service. The V-shape setup supports the migration of the RTGS services to the ISO 20022 messaging standard. It also provides for network-agnostic connectivity and enhanced information security.

**Figure B**

T2-T2S Consolidation go-live approach



The big bang approach requires that all national central banks and their communities are prepared to migrate on time. Each T2 participant is responsible for ensuring its own readiness and for establishing its own adaptation plan to the new T2 service and the common components.

To support their efforts, however, the Eurosystem will take action to monitor the community's readiness and mitigate possible migration risks. It has already identified [a list of key milestones](#) with indicated deadlines to be considered by the T2 community. If participants face any difficulties in complying with the milestones on time, they should inform their respective national central bank.

Due to the magnitude of change brought by the T2-T2S Consolidation project, the Eurosystem invites T2 participants to prioritise their preparations and ensure they can migrate in a synchronised way with the other national communities.

## Additional data

**Table**

Distribution of payment flows in TARGET2

|              | 2017                    |      |            |      | 2018                    |      |            |      |
|--------------|-------------------------|------|------------|------|-------------------------|------|------------|------|
|              | Value<br>(EUR billions) | %    | Volume     | %    | Value<br>(EUR billions) | %    | Volume     | %    |
| <b>AT</b>    | 4,775                   | 1%   | 1,561,683  | 2%   | 5,377                   | 1%   | 1,696,321  | 2%   |
| <b>BE</b>    | 19,732                  | 5%   | 2,279,908  | 3%   | 22,595                  | 5%   | 2,308,662  | 3%   |
| <b>BG</b>    | 351                     | 0%   | 250,460    | 0%   | 447                     | 0%   | 305,003    | 0%   |
| <b>CY</b>    | 71                      | 0%   | 184,999    | 0%   | 79                      | 0%   | 192,326    | 0%   |
| <b>DE</b>    | 160,959                 | 37%  | 43,998,037 | 49%  | 167,563                 | 39%  | 46,709,185 | 53%  |
| <b>DK</b>    | 4,245                   | 1%   | 162,691    | 0%   | 2,238                   | 1%   | 168,862    | 0%   |
| <b>EE</b>    | 118                     | 0%   | 1,086,397  | 1%   | 79                      | 0%   | 372,754    | 0%   |
| <b>ES</b>    | 26,998                  | 6%   | 10,099,446 | 11%  | 16,088                  | 4%   | 6,074,811  | 7%   |
| <b>EU</b>    | 13,409                  | 3%   | 179,520    | 0%   | 13,569                  | 3%   | 185,031    | 0%   |
| <b>FI</b>    | 12,710                  | 3%   | 419,552    | 0%   | 11,893                  | 3%   | 420,890    | 0%   |
| <b>FR</b>    | 66,856                  | 15%  | 8,171,919  | 9%   | 63,881                  | 15%  | 8,487,848  | 10%  |
| <b>GR</b>    | 1,437                   | 0%   | 688,748    | 1%   | 938                     | 0%   | 711,536    | 1%   |
| <b>HR</b>    | 81                      | 0%   | 86,306     | 0%   | 98                      | 0%   | 94,149     | 0%   |
| <b>IE</b>    | 3,271                   | 1%   | 841,269    | 1%   | 2,988                   | 1%   | 869,223    | 1%   |
| <b>IT</b>    | 17,725                  | 4%   | 8,552,678  | 10%  | 18,104                  | 4%   | 8,354,383  | 9%   |
| <b>LT</b>    | 150                     | 0%   | 67,133     | 0%   | 109                     | 0%   | 67,260     | 0%   |
| <b>LU</b>    | 27,653                  | 6%   | 1,477,642  | 2%   | 32,958                  | 8%   | 1,630,972  | 2%   |
| <b>LV</b>    | 239                     | 0%   | 479,307    | 1%   | 195                     | 0%   | 505,868    | 1%   |
| <b>MT</b>    | 844                     | 0%   | 115,016    | 0%   | 1,052                   | 0%   | 117,007    | 0%   |
| <b>NL</b>    | 68,435                  | 16%  | 5,592,224  | 6%   | 69,435                  | 16%  | 6,140,598  | 7%   |
| <b>PL</b>    | 593                     | 0%   | 883,235    | 1%   | 835                     | 0%   | 948,559    | 1%   |
| <b>PT</b>    | 1,264                   | 0%   | 1,051,957  | 1%   | 1,146                   | 0%   | 1,142,455  | 1%   |
| <b>RO</b>    | 83                      | 0%   | 146,686    | 0%   | 91                      | 0%   | 106,850    | 0%   |
| <b>SI</b>    | 286                     | 0%   | 679,944    | 1%   | 258                     | 0%   | 658,369    | 1%   |
| <b>SK</b>    | 496                     | 0%   | 220,187    | 0%   | 491                     | 0%   | 173,719    | 0%   |
| <b>Total</b> | 432,781                 | 100% | 89,276,944 | 100% | 432,508                 | 100% | 88,442,641 | 100% |

### Conventions used in the tables

“-” data do not exist/data are not applicable

“.” data are not yet available

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