

Cross-Currency Settlement of Instant Payments in a Multi-Currency Clearing and Settlement Mechanism*

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Abstract

Starting from the observed gap, mainly in terms of cost and speed, between domestic and cross-border retail payments in Europe, this paper focuses on the opportunities that a multi-currency technical platform may offer in bridging this gap.

In particular, the ECB, in collaboration with Riksbank and Banca d'Italia (in its role of service provider of market infrastructures for the Eurosystem) started analyzing how TIPS (TARGET Instant Payment Settlement), as a multi-currency platform for the settlement of instant payments in central bank money, could support instant payment transactions across different currencies.

Moving from a general overview of the recent developments in the market and the demand from public authorities to improve the efficiency of cross-border payments, the paper describes a three-layer model for the processing of cross-currency payments in a multi-currency clearing and settlement mechanism. Within this framework, different possible ways to handle the main elements of a cross-currency transaction (i.e. the determination of the applicable exchange rate for a given transaction, the way to apply the agreed exchange rate and the settlement model) are identified and described. A methodology for assessing and comparing the different models identified for the three processing layers is also provided.

Against this background, the paper concludes by providing a number of considerations (of policy, business, technical, operational and legal nature) to be taken into due account in the finalization of the ongoing analysis for the provision of a cross-currency instant payment settlement in TIPS, and its potential applicability in the broader context of cross-border payments between different technical platforms.

1. Introduction

The recent macroeconomics and international trade developments - such as the increase of global e-commerce, the growing role of SMEs in international businesses, increasing migration flows and retail remittances, as well as tourism – are leading to a higher demand for reliable, inexpensive and fast cross-border and cross-currency payments.

While the domestic payments are rather fast, less expensive and standardized, international payments are falling behind, which unveils opportunities for international platform providers [1]. Against this background, fostering cross-border and cross-currency payments is a topic that has recently gained great attention from political leaders, the central bank community and the international standard-setting bodies. Under the Saudi Arabian Presidency, the G20 has made enhanced cross-border payments a priority.

On 13 October 2020, the Financial Stability Board (FSB) published the G20 cross-border payments roadmap for faster, cheaper, more transparent and inclusive cross-border payments [2]. The roadmap contains 19 building blocks with concrete measures and an ambitious time plan for implementation. The timeline is challenging; a considerable support and a strong commitment will be needed from both the private and the public sectors to achieve its goals. One of these building blocks is considering the establishing of multilateral platforms and arrangements for cross-border payments. This is the focus of the present paper.

* The views expressed in this paper are those of the authors and do not necessarily reflect the views of the institutions with which the authors are affiliated.

In Europe, cross-border payments in euro are based on established standards within the context of the Single Euro Payments Area (SEPA). Conversely, cross-currency payments are still to a large extent addressed via correspondent banking and/or international card schemes and are almost entirely based on commercial bank money. A higher degree of credit and liquidity risks is therefore present, since the settlement does not occur in central bank money [3]. Higher costs and risks of the settlement in commercial bank money are also stemming from the long end-to-end processing times, given the lack of instant payments solutions. Inefficiencies in cross-border payments affect also European users when making or receiving payments to/from outside Europe and even between accounts in different EU currencies. In contrast to intra-EU payments, cross-border payments to and from non-EU countries are not subject to the same legal coverage as transactions within the EU, e.g. as regards speed, costs and transparency². The high fragmentation and the absence of harmonized rule is hampering end users, consumers and businesses, in exchanging money with foreign countries, with negative effects on cross-border trade, investments and remittances. The goal of making cross-border payments easier, faster and cheaper has therefore become crucial also for the Eurosystem and European Commission's Retail Payments Strategies, which are complementing each other.

In this respect, the involvement of non-euro area Member States to a bigger extent in the activities of fostering cross-border payments by increasing their efficiency would bring further benefits to the European Union, its business and citizens. In this regard, after the agreement that associated Riksbank's new service RIX-INST with the Eurosystem's TIPS (TARGET Instant Payment Settlement) platform, the ECB, in collaboration with Riksbank and Banca d'Italia (in its role of service provider of market infrastructures for the Eurosystem) started to analyse how TIPS can promote a business solution to support payment cross-currency transactions.

While the current analyses obviously focus on instant payments between the euro and the Swedish krona (and vice versa), the solution should be open for addition of other non-euro EU/EEA currencies.

Such an initiative, bringing innovation further and setting the stage for the forward-looking payments landscape, could be seen as a part of the European and global efforts for enhancing cross-border payments, creating a more efficient international market and strengthening the international role of the euro.

This paper is organized as follows: Chapter 2 and 3 illustrate the context in which the analysis of a cross-currency settlement service for instant payments was started and define the basic terminology used throughout the paper, respectively. Chapter 4 outlines the three processing layers

² PSD2 covering to a certain extent the EU-leg of a cross-border payment.

that were considered in the analysis, while the following Chapter from 5 to 7 describe in detail the different models identified and assessed for each of three processing layers. Based on this general framework, Chapter 8 shows how the different settlement models may be implemented in TIPS, the pan-European instant payment settlement platform provided and operated by the Eurosystem. Chapters from 9 to 11 follow with a number of business, policy, technical, operational and legal considerations on the provision of a cross-currency settlement service for instant payments in TIPS. Finally, Chapter 12 draws some conclusions on the work that has already been done and gives indications on the expected future developments in this area of investigation.

2. Context description

The settlement of final and irrevocable instant payments euro in central bank money is currently offered by TIPS platform. Launched by the Eurosystem in November 2018, TIPS ensures a 24/7/365 service, designed to be multi-currency. The Eurosystem's strategy for TIPS is twofold: on one hand, the Eurosystem is committed to ensure pan-European reachability for instant payments in the euro area; on the other hand, it aims at keeping schemes and workflows of other currencies in TIPS aligned. This aspect, initially seen as an attempt to limit the complexity in TIPS, turned out to be a key advantage of the platform, which can be used "to break the silos" in providing a platform for cross-currency instant payments, beyond the Eurozone.

Also, in the current setup, a Payment Service Provider (PSP) may settle the final leg of a cross-currency instant payment transaction on the TIPS technical platform when the end user is to receive the funds in euro³. The go-live of the Swedish krona on the TIPS technical platform in May 2022 may further facilitate a business model in which a PSP supports instant cross-currency payments between euro and the Swedish krona for its end customers and/or other PSPs by acting as a participant/reachable party both in TIPS and in RIX-INST. In order to increase efficiency, the TIPS technical platform for cross-currency instant payments could be further developed, so as to make it possible to settle the final leg of a cross-currency instant payment and, in particular, for introducing the possibility to settle cross-currency instant payments end-to-end in central bank money across a currency pair available on the platform.

For such purpose, the TIPS technical platform would have to be enriched with technical/functional changes that can be decomposed into different layers, depending on the extent to which the TIPS technical platform is expected to support this type of payment processing. The functionality of each of the three processing layers described in section 4

³ The SWIFT trial on instant cross-border gpi payments through TIPS is an example of this. Please see the 21 May 2019 SWIFT press release [4] and 22 May 2019 ECB press release [5] on gpi payment trials in TIPS.

should be fulfilled before the payment can be processed within the next layer, this from the outside and inwards.

3. Terminology

This section provides a number of definitions that will be used in the remainder of this paper.

A **Multi-Currency Clearing and Settlement Mechanism (CSM)** is a system implementing the processes underlying all payment transactions exchanged between two PSPs in a multi-currency scenario, i.e. a scenario where payments may take place in different currencies even though, for each payment, the debited and the credited accounts are denominated in the same currency.

The two PSPs involved in a payment are named *Originator PSP* (on the debit side) and *Beneficiary PSP* (on the credit side).

A **cross-currency payment** refers to the entire transactions chain which results in the debiting of an account in one currency and the crediting of an account in another currency.

The Originator PSP sends a **cross-currency payment message** to instruct an instant payment in which debited and credited accounts are in different currencies.

The Beneficiary PSP returns a **cross-currency payment confirmation message** to accept a previously received *cross-currency payment message*.

The Multi-Currency CSM sends a **cross-currency settlement confirmation message** to notify the settlement of a previously received *cross-currency payment message*.

A **mono-currency payment** refers to the entire transactions chain which results in the debiting of an account in one currency and the crediting of an account in the same currency.

The Originator PSP sends a **mono-currency payment message** to instruct an instant payment which debits and credits two accounts in the same currency.

The Beneficiary PSP returns a **mono-currency payment confirmation message** to accept a previously received *mono-currency payment message*.

The Multi-Currency CSM sends a **mono-currency settlement confirmation message** to notify the settlement of a previously received *mono-currency payment message*.

The Originator PSP sends a **linked payment message** to instruct a (cross-currency or mono-currency) instant payment that the Multi-Currency CSM may only settle simultaneously with another *linked payment message*.

A **cross-currency technical account** is a Central Bank account that is debited (or credited) each time a *cross-currency payment* credits (or debits) the account of a PSP with the same currency.

For example, the *cross-currency technical account* for euro belongs to the ECB, whereas the *cross-currency technical account* for SEK belong to the Sveriges Riksbank.

Payment versus payment is a settlement mechanism that ensures that the final transfer of a payment in one currency occurs if and only if the final transfer of a payment in another currency takes place.

A **cross-currency PSP** is a PSP holding accounts in multiple currencies in the Multi-Currency CSM. This implies that a *cross-currency PSP* has to be setup as multiple parties in the Multi-Currency CSM, one for each currency. For example, a *cross-currency PSP* settling in euro and SEK has to be setup as two parties, one with an account in euro in the book of a euro Central Bank and one with an account in SEK in the book of the Sveriges Riksbank.

4. Processing layers

The following diagram shows the three nested layers according to which the processing of a cross-currency payment has been modelled and analysed in this paper:

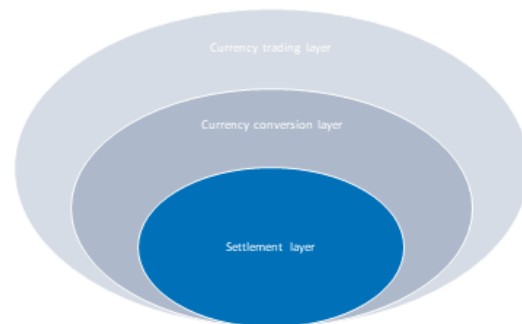


DIAGRAM 1 – PROCESSING LAYERS

The following sub-sections define in detail the three processing layers and their scope.

4.1. Currency trading layer

The Currency trading layer relates to the determination of the currency conversion rate for a given cross-currency payment prior to its settlement in a Multi-Currency CSM technical platform. The currency conversion rate may be defined (i) in a decentralised manner outside of the Multi-Currency CSM technical platform (e.g. PSPs interact bilaterally between each other to define the currency conversion rate); or (ii) in a centralised manner based on a functionality that the Multi-Currency CSM technical platform would provide.

4.2. Currency conversion layer

The Currency conversion layer relates to the way a previously identified currency conversion rate is used during the settlement of a cross-currency payment during its settlement in a Multi-Currency CSM technical platform. The currency conversion rate may be implemented either (i) as a reference data element; (ii) as part of the cross-currency payment message that the Multi-Currency CSM technical platform receives; or (iii) as a combination of the previous two options.

In this layer, different scenarios could be identified for the central bank or a PSP acting as an intermediary between

the Originator PSP and the Beneficiary PSP for the cross-currency payment. The intermediary would *de facto* also bear the FX-risk of the settlement.

4.3. Settlement layer

The Settlement layer concerns the actual transactions/movement of funds on the Multi-Currency CSM technical platform in relation to a cross-currency payment by either (i) debiting an account in one currency and crediting another account in a second currency for end-to-end central bank settlement; or (ii) debiting an account in one currency and another account in the same currency for the final leg of a cross-currency payment.

5. Currency trading models

This section describes two possible currency trading models that may be applied, before the settlement takes place, to determine the value of the exchange rate to be used for the settlement of a given *cross-currency payment*.

5.1. Distributed Currency Trading (DCT) model

In the Distributed Currency Trading (DCT) model, the Originator PSP interacts bilaterally with one or multiple Cross-Currency PSPs, in order to get the exchange rate value each of them apply and select the best available exchange rate to be used for the settlement of a given *cross-currency payment*.

Thereafter, the Originator PSP uses the selected exchange rate for the settlement of the *cross-currency payment*, according to one of the currency conversion models described in the next section.

5.2. Centralized Currency Trading (CCT) model

In the Centralized Currency Trading (CCT) model, the Originator PSP interacts with a Central Exchange Hub (CEH), which stores the exchange rate values applied by the different Cross-Currency PSPs. The CEH returns to the Originator PSP the best available exchange rate, which the Originator PSP uses for the settlement of a given *cross-currency payment*, according to one of the currency conversion models described in the next section.

The existence of a CEH does not preclude the possibility for PSPs to agree on exchange rates outside the CEH and use them for settlement in the Multi-Currency CSM.

6. Currency conversion models

This section describes two possible currency conversion models that may be applied for the processing of *cross-currency payments* in the Multi-Currency CSM.

6.1. Dynamic Exchange Rate (DER) model

The Dynamic Exchange Rate (DER) model calculates the conversion rate to be applied for a given *cross-currency payment* based on an exchange rate dynamically identified for each *cross-currency payment*, before the settlement process takes place.

6.2. Static Exchange Rate (SER) model

The Static Exchange Rate (SER) model calculates the conversion rate to be applied for a given *cross-currency payment* based on an exchange rate statically applied for each *cross-currency payment*, during the settlement process.

This static exchange rate may be defined at system level (and be applied to all *cross-currency payments*) or be defined at PSP level (and be applied to *cross-currency payments* depending on the involved PSPs). The static exchange rate (or rates) may be updated on a daily basis or multiple times during the day.

7. Settlement models

This section describes three possible settlement models that may be applied for the processing and settlement of *cross-currency payments* in the Multi-Currency CSM.

7.1. Single Transaction (ST) model

The Single Transaction (ST) model processes a cross-currency payment with one transaction only, which debits the Originator PSP account and credits (in a different currency) the Beneficiary PSP account:

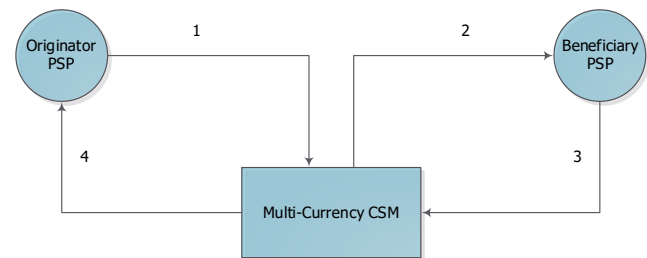


DIAGRAM 2 – SINGLE TRANSACTION MODEL

Within this scenario, the settlement of a given cross-currency payment is processed according to the following steps:

| Step | Description |
|------|---|
| 1 | The Originator PSP sends a <i>cross-currency payment message</i> to the Multi-Currency CSM. |
| 2 | In case of successful validation of the <i>cross-currency payment message</i> received from the Originator PSP, the Multi-Currency CSM reserves the amount to be debited, expressed in the currency of the originator, on the account of the Originator PSP and sends the <i>cross-currency payment message</i> to the Beneficiary PSP. |
| 3 | In case of acceptance of the <i>cross-currency payment message</i> received from the Multi-Currency CSM, the Beneficiary PSP sends back to the CSM a <i>cross-currency payment</i> |

| Step | Description |
|------|--|
| | <i>confirmation message.</i> |
| 4 | <p>In case of successful validation of the <i>cross-currency payment confirmation message</i> received from the Beneficiary PSP, the Multi-Currency CSM settles the <i>cross-currency payment</i> as follows:</p> <ul style="list-style-type: none"> • it debits the Originator PSP account with the amount previously reserved, • it credits the cross-currency technical account of the Central Bank of the Originator PSP with the same amount, • it debits the cross-currency technical account of the Central Bank of the Beneficiary PSP with the amount to be credited to the Beneficiary PSP, expressed in the currency of the beneficiary, • it credits the Beneficiary PSP account with the same amount. <p>Thereafter, the Multi-Currency CSM sends back both to the Originator PSP and to the Beneficiary PSP the related <i>cross-currency settlement confirmation message</i>.</p> |

7.2. Two Transactions (2T) model

The Two Transactions (2T) model processes a cross-currency payment with two transactions, the former between the Originator PSP and a Cross-Currency PSP (in the currency of the originator), the latter between the same Cross-Currency PSP and the Beneficiary PSP (in the currency of the beneficiary):

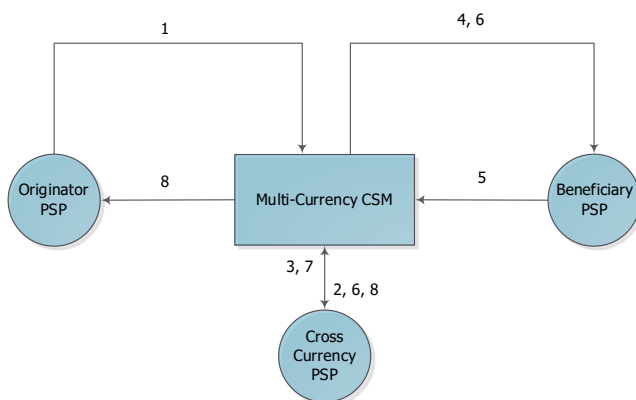


DIAGRAM 3 – TWO TRANSACTIONS MODEL

Within this scenario, the settlement of a given cross-currency payment is processed according to the following steps:

| Step | Description |
|------|--|
| 1 | The Originator PSP sends a <i>cross-currency payment message</i> to the Multi-Currency |

| Step | Description |
|------|--|
| | CSM. |
| 2 | In case of successful validation of the <i>cross-currency payment message</i> received from the Originator PSP, the Multi-Currency CSM reserves the amount to be debited, expressed in the currency of the originator, on the account of the Originator PSP and sends the <i>cross-currency payment message</i> to the Cross-Currency PSP. |
| 3 | In case of acceptance of the <i>cross-currency payment message</i> received from the Multi-Currency CSM, the Cross-Currency PSP sends the corresponding <i>mono-currency payment</i> , expressed in the currency of the beneficiary, to the CSM. |
| 4 | In case of successful validation of the <i>mono-currency payment message</i> received from the Cross-Currency PSP, the Multi-Currency CSM reserves the amount to be debited, expressed in the currency of the beneficiary, on the account of the Cross-Currency PSP and sends the <i>mono-currency payment message</i> to the Beneficiary PSP. |
| 5 | In case of acceptance of the <i>mono-currency payment message</i> received from the Multi-Currency CSM, the Beneficiary PSP sends back to the CSM a <i>mono-currency payment confirmation message</i> . |
| 6 | <p>In case of successful validation of the <i>mono-currency payment confirmation message</i> received from the Beneficiary PSP, the Multi-Currency CSM settles the <i>mono-currency payment</i> as follows:</p> <ul style="list-style-type: none"> • it debits the Cross-Currency PSP account with the amount previously reserved, • it credits the Beneficiary PSP account with the same amount. <p>Thereafter, the Multi-Currency CSM sends back both to the Cross-Currency PSP and to the Beneficiary PSP the related <i>mono-currency settlement confirmation message</i>.</p> |
| 7 | After having received the <i>mono-currency settlement confirmation message</i> from the Multi-Currency CSM, the Cross-Currency PSP sends back to the CSM a <i>cross-currency payment confirmation message</i> . |
| 8 | In case of successful validation of the <i>cross-currency payment confirmation message</i> received from the Cross-Currency PSP, the Multi-Currency CSM settles the <i>cross-currency payment</i> as follows: |

| Step | Description |
|------|---|
| | <ul style="list-style-type: none"> it debits the Originator PSP account with the amount previously reserved, it credits the Cross-Currency PSP account with the same amount. <p>Thereafter, the Multi-Currency CSM sends back both to the Originator PSP and to the Cross-Currency PSP the related <i>cross-currency settlement confirmation message</i>.</p> |

7.3. Linked Transactions (LT) model

Like the 2T model, the Linked Transactions (LT) model processes a cross-currency payment with two transactions, the former between the Originator PSP and a Cross-Currency PSP (in the currency of the originator), the latter between the same Cross-Currency PSP and the Beneficiary PSP (in the currency of the beneficiary). However, differently from the T2 model, with the LT model the Multi-Currency CSM ensures that the two transactions are settled at the same time:

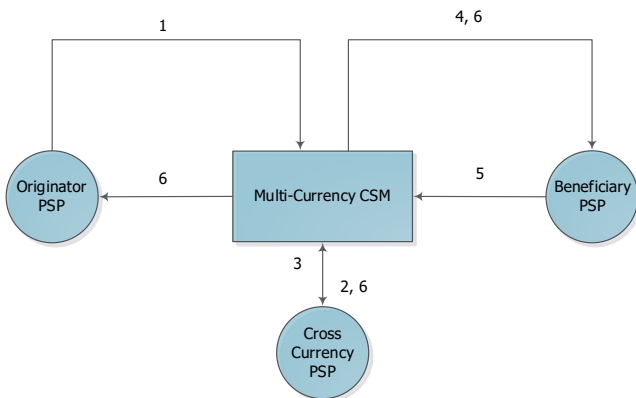


DIAGRAM 4 – LINKED TRANSACTIONS MODEL

Within this scenario, the settlement of a given cross-currency payment is processed according to the following steps:

| Step | Description |
|------|--|
| 1 | The Originator PSP sends a <i>linked cross-currency payment message</i> to the Multi-Currency CSM. |
| 2 | In case of successful validation of the <i>linked cross-currency payment message</i> received from the Originator PSP, the Multi-Currency CSM reserves the amount to be debited, expressed in the currency of the originator, on the account of the Originator PSP and sends the <i>linked cross-currency payment message</i> to the Cross-Currency PSP. |
| 3 | In case of acceptance of the <i>linked cross-currency payment message</i> received from the |

| Step | Description |
|------|---|
| | <p>Multi-Currency CSM, the Cross-Currency PSP sends back to the CSM</p> <ul style="list-style-type: none"> a <i>linked-cross-currency payment confirmation message</i> and the corresponding <i>linked mono-currency payment</i>, expressed in the currency of the beneficiary. |
| 4 | In case of successful validation of the <i>linked mono-currency payment message</i> received from the Cross-Currency PSP, the Multi-Currency CSM reserves the amount to be debited, expressed in the currency of the beneficiary, on the account of the Cross-Currency PSP and sends the <i>linked mono-currency payment message</i> to the Beneficiary PSP. |
| 5 | In case of acceptance of the <i>linked mono-currency payment message</i> received from the Multi-Currency CSM, the Beneficiary PSP sends back to the CSM a <i>linked mono-currency payment confirmation message</i> . |
| 6 | <p>In case of successful validation of the <i>linked mono-currency payment confirmation message</i> received from the Beneficiary PSP (and of the <i>linked cross-currency payment confirmation message</i> received from the Cross-Currency PSP), the Multi-Currency CSM settles the <i>cross-currency payment</i> as follows:</p> <ul style="list-style-type: none"> it debits the Originator PSP account with the amount previously reserved, it credits the Cross-Currency PSP account with the same amount, it debits the Cross-Currency PSP account with the amount previously reserved, it credits the Beneficiary PSP account with the same amount. <p>Thereafter, the Multi-Currency CSM sends back:</p> <ul style="list-style-type: none"> to the Originator PSP the relevant <i>linked cross-currency settlement confirmation message</i> and to the Cross-Currency PSP and to the Beneficiary PSP the relevant <i>linked mono-currency settlement confirmation message</i>. |

8. TIPS: a potential real-life scenario

The theoretical settlement models described in the previous section may find a real-life application by using the

TIPS (TARGET Instant Payment Settlement) technical platform as Multi-Currency CSM. The remainder of this section provides a general overview of TIPS (see 8.1) and, thereafter (see 8.2 to 8.4), a description of the three identified cross-currency settlement models.

8.1. TIPS overview

TIPS [6] was launched by the Eurosystem in November 2018 and offers final and irrevocable settlement of instant payments in central bank money, available every day of the year, 24 hours a day. TIPS is by design a multi-currency platform, and compliant with the EPC SCT Inst scheme for the processing instant payments in euro. The Eurosystem’s strategy for TIPS has been pursued along two lines: on the one hand, ensuring pan-European reachability for instant payments in the euro area, and on the other hand, insisting on the necessity to keep schemes and workflows of other currencies in TIPS aligned. What initially could be seen as an attempt to limit the complexity in TIPS has turned out to be a strong element that could be used “to break the silos” in providing a platform for instant cross-currency payments, beyond the Eurozone.

As of today, TIPS implements two different settlement models:

- *2-Instructing Parties (2IP)*: within this model, the Instructing Parties of the Originator PSP and of the Beneficiary PSP are different and the settlement of an instant payment takes place in two phases. In the first phase (*conditional settlement phase*), TIPS reserves the settlement amount on the account of the Originator PSP; afterwards TIPS forwards the instant payment to the Beneficiary PSP for confirmation. Upon confirmation from the Beneficiary PSP, TIPS settles the instant payment in the second phase (*settlement phase*).
- *Single Instructing Party (SIP)*: within this model, the Originator PSP and the Beneficiary PSP make use of the same Instructing Party and the settlement of an instant payment takes place in one phase. Upon reception in TIPS, the instant payment is settled immediately, without preliminary reservation of funds. This implies the Beneficiary PSP confirmed the acceptance of the instant payment before the Single Instructing Party sends it to TIPS for settlement.

8.2. Single Transaction (ST) model in TIPS

The Single Transaction (ST) model in TIPS may be applied with the 2-IP settlement model and the SIP settlement model.

The following diagram shows a business scenario in which the Originator PSP and the Beneficiary PSP use the 2-IP settlement model.

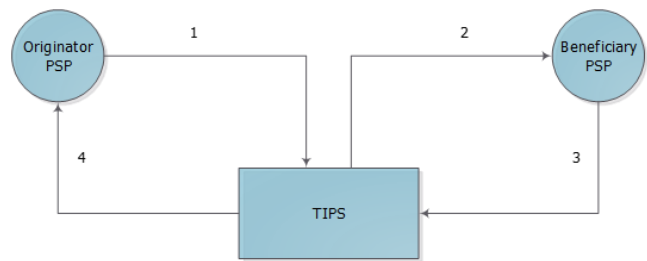


DIAGRAM 5 – SINGLE TRANSACTION MODEL

Within this scenario, the settlement of a given *cross-currency payment* is processed according to the following steps:

| Step | Description |
|------|---|
| 1 | The Originator PSP sends a <i>cross-currency payment message</i> to TIPS. |
| 2 | In case of successful validation of the <i>cross-currency payment message</i> received from the Originator PSP, TIPS reserves the amount to be debited, expressed in the currency of the originator, on the account of the Originator PSP and sends the <i>cross-currency payment message</i> to the Beneficiary PSP. |
| 3 | In case of acceptance of the <i>cross-currency payment message</i> received from TIPS, the Beneficiary PSP sends back to TIPS a <i>cross-currency payment confirmation message</i> . |
| 4 | In case of successful validation of the <i>cross-currency payment confirmation message</i> received from the Beneficiary PSP, TIPS settles the <i>cross-currency payment</i> as follows: <ul style="list-style-type: none"> • it debits the Originator PSP account with the amount previously reserved, • it credits the cross-currency technical account of the Central Bank of the Originator PSP with the same amount, • it debits the cross-currency technical account of the Central Bank of the Beneficiary PSP, expressed in the currency of the beneficiary, • it credits the Beneficiary PSP account with the same amount. Thereafter, TIPS sends back both to the Originator PSP and to the Beneficiary PSP the related <i>cross-currency settlement confirmation message</i> . |

8.3. Two Transactions (2T) model in TIPS

The Two Transactions (2T) model in TIPS may be applied both with the 2-IP settlement model and with the SIP settlement model for both transactions.

The following diagram shows a business scenario in which the Originator PSP uses the 2-IP model, the Beneficiary PSP uses the SIP model and the Cross-Currency PSP uses both models (2-IP for the transaction with the Originator PSP and SIP for the transaction with the Beneficiary PSP):

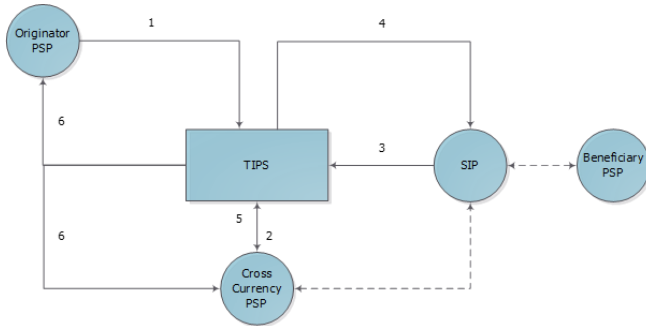


DIAGRAM 6 – TWO TRANSACTIONS MODEL

Within this scenario, the settlement of a given *cross-currency payment* is processed according to the following steps:

| Step | Description |
|------|---|
| 1 | The Originator PSP sends a <i>cross-currency payment message</i> to TIPS. |
| 2 | In case of successful validation of the <i>cross-currency payment message</i> received from the Originator PSP, TIPS reserves the amount to be debited, expressed in the currency of the originator, on the account of the Originator PSP and sends the <i>cross-currency payment message</i> to the Cross-Currency PSP. |
| 3 | In case of acceptance of the <i>cross-currency payment message</i> received from TIPS, the Cross-Currency PSP sends the corresponding <i>mono-currency payment</i> , expressed in the currency of the beneficiary, to its Single Instructing Party, so that it can be exchanged and be confirmed with the Beneficiary PSP. After having confirmed the <i>mono-currency payment</i> received from the Cross-Currency PSP, the Single Instructing Party sends the <i>mono-currency payment message</i> to TIPS. |
| 4 | In case of successful validation of the <i>mono-currency payment message</i> received from the Single Instructing Party, TIPS settles the <i>mono-currency payment</i> as follows: <ul style="list-style-type: none"> it debits the Cross-Currency PSP account with the amount to be credited to the Beneficiary PSP, it credits the Beneficiary PSP account with the same amount. |

| Step | Description |
|------|---|
| | Thereafter, TIPS sends back to the Single Instructing Party the related <i>mono-currency settlement confirmation message</i> . |
| 5 | After having received the <i>mono-currency settlement confirmation message</i> from the Single Instructing Party, the Cross-Currency PSP sends back to TIPS a <i>cross-currency payment confirmation message</i> . |
| 6 | In case of successful validation of the <i>cross-currency payment confirmation message</i> received from the Cross-Currency PSP, TIPS settles the <i>cross-currency payment</i> as follows: <ul style="list-style-type: none"> it debits the Originator PSP account with the amount previously reserved, it credits the Cross-Currency PSP account with the same amount. Thereafter, TIPS sends back both to the Originator PSP and to the Cross-Currency PSP the related <i>cross-currency settlement confirmation message</i> . |

8.4. Linked Transactions (LT) model in TIPS

The Linked Transactions (LT) model in TIPS may be applied both with the 2-IP settlement model and with the SIP settlement model for both transactions.

The following diagram shows a business scenario in which the Originator PSP uses the SIP model, the Beneficiary PSP uses the 2-IP model and the Cross-Currency PSP uses both models (SIP for the transaction with the Originator PSP and 2-IP for the transaction with the Beneficiary PSP):

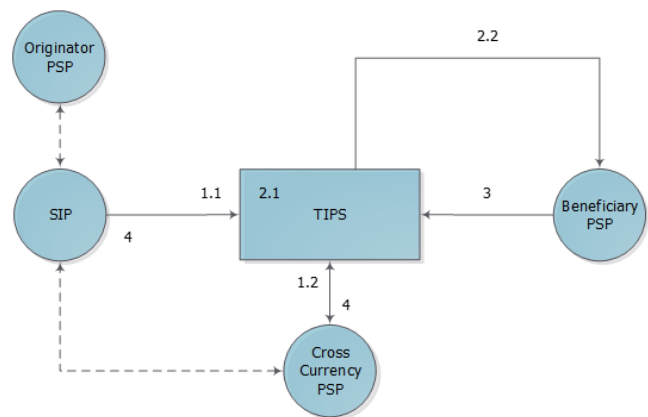


DIAGRAM 7 – LINKED TRANSACTIONS MODEL

Within this scenario, the settlement of a given *cross-currency payment* is processed according to the following steps:

| Step | Description |
|------|--|
| 1.1 | <p>The Originator PSP sends a <i>cross-currency payment</i> to its Single Instructing Party, so that it can be exchanged and confirmed with the Cross-Currency PSP.</p> <p>After having confirmed the <i>cross-currency payment</i> received from the Originator PSP, the Single Instructing Party sends a <i>linked mono-currency payment message</i> (expressed in the currency of the originator) to TIPS.</p> |
| 1.2 | In parallel, the Cross-Currency PSP sends another <i>linked mono-currency payment message</i> (expressed in the currency of the beneficiary) to TIPS. |
| 2.1 | In case of successful validation of the <i>linked mono-currency payment message</i> received from the Single Instructing Party, TIPS reserves the amount to be debited, expressed in the currency of the originator, on the account of the Originator PSP. |
| 2.2 | In case of successful validation of the <i>linked mono-currency payment message</i> received from the Cross-Currency PSP, TIPS reserves the amount to be debited, expressed in the currency of the beneficiary, on the account of the Cross-Currency PSP and sends the <i>linked mono-currency payment message</i> to the Beneficiary PSP. |
| 3 | In case of acceptance of the <i>linked mono-currency payment message</i> received from TIPS, the Beneficiary PSP sends back to TIPS a <i>linked mono-currency payment confirmation message</i> . |
| 4 | <p>In case of successful validation of the <i>linked mono-currency payment confirmation message</i> received from the Beneficiary PSP, TIPS settles the cross-currency payment as follows:</p> <ul style="list-style-type: none"> • it debits the Originator PSP account with the amount previously reserved, • it credits the Cross-Currency PSP account with the same amount, • it debits the Cross-Currency PSP account with the amount previously reserved, • it credits the Beneficiary PSP account with the same amount. <p>Thereafter, TIPS sends back</p> <ul style="list-style-type: none"> • to the Single Instructing Party the relevant <i>linked mono-currency settlement confirmation message</i> and • to the Cross-Currency PSP and to the |

| Step | Description |
|------|--|
| | Beneficiary PSP the relevant <i>linked mono-currency settlement confirmation message</i> . |

9. Business and policy considerations

Typically, cross-currency retail payments are remote payments, involving the national payment systems of at least two jurisdictions, different currencies and specialised processes, including the execution and settlement of foreign exchange transactions.

Recent developments towards digitalisation and globalisation have also affected the area of payments, bringing new actors, new technical solutions and new services. Trade and investment are becoming more and more international, as well as individuals who are working, studying, and travelling cross-border. Following that trend, there is an increasing demand for convenient, reliable and cheap cross-border and cross-currency payments.

The current offerings and developments in international payments are almost entirely based on commercial bank money, with the related risks and costs, especially in view of long end-to-end processing times. Other solutions are based on platforms or similar closed-loop systems, requiring both payer and payee to be customers of the same payment service provider.

The velocity of change with globalisation and digitalisation has also attracted several new global initiatives that look into possibilities to overcome shortcomings in cross-border and cross-currency payments by building new separate payment ecosystems. These initiatives highlight the rapidly rising consumer demand for payment services that work across borders and that are also faster, cheaper and easier to use. These initiatives offer new solutions of which some are still untested and could pose significant risks to the transmission of monetary policy, financial stability as well as the safety and efficiency of payment systems, relying exclusively on non-European arrangements. For example, offering non-central bank digital currencies or payment services settling in commercial bank money.

The combination of dependency on non-European global players and European payments market fragmentation require actions to overcome these policy concerns in order to ensure that Europe is not lagging behind international players offering innovative developments.

The improvement of cross-border payments is issue for global efforts under the aegis of the G20 finance ministers and central bank governors, who tasked the FSB together with the Committee on Payments and Market Infrastructures (CPMI) and other international bodies to develop a roadmap to enhance cross-border payments.

Following the request of the G20, the FSB published, on 9 April 2020, a report [7] stating that faster, cheaper, more transparent and more inclusive cross-border payment services would have widespread benefits for citizens and economies worldwide, supporting economic growth, inter-

national trade, global development and financial inclusion. The second stage report by the CPMI, from 13 July 2020 [8], sets out areas where public sector work could assist in improving cross-border payments systems or removing unnecessary barriers.

In October 2020, the G20 endorsed a roadmap presented by the FSB, setting an ambitious but achievable set of goals and milestones designed to allow for flexibility and adaptation, while ensuring that the safeguards in terms of secure processing and legal compliance are observed. The roadmap consists of five focus areas, encompassing a variety of approaches and time horizons in order to achieve practical improvements. These focus areas are further detailed in 19 different building blocks listing activities to promote cross-border payments. One of these building blocks is focusing on exploring the potential that new multilateral cross-border payment platforms and arrangements could potentially offer to improve cross-border payments.

Individual actions are now being initiated and taken forward by the most suitable expert bodies, in accordance with their mandates, with the FSB providing coordination and reporting annually on progress to the G20 and the public. The involvement of the private sector, sharing their insights and practical expertise, as well as delivering change, will be key to support the practical implementation of the roadmap.

Promoting cross-border payments is also high on the agenda of the European Union. The European Commission is highlighting the importance of both cross-border settlement and payments in its new Capital Markets Union action plan [9], and its Retail Payments Strategy [10], both published on 24 September 2020.

The Capital Markets Union action plan emphasises the need for the EU to develop its own critical market infrastructure and services. Well developed markets are a necessary condition for the EU's financial and economic autonomy, an issue, which goes hand-in-hand with the promotion of a stronger international role for the euro. Enhancing cross-border provision of settlement services in the EU is accordingly one of the action points aiming to reduce obstacles that impede the free flow of capital in the EU.

In its Retail Payments Strategy, the Commission is emphasising the importance of extending the availability of cross-border infrastructures from euro to other EU currencies to ensure pan-European instant payments. The Commission furthermore emphasises the potential for innovation brought forward by the agreement between the Riksbank and the Eurosystem allowing settlement of instant payments in the first non-euro currency (Swedish krona) in TIPS, which, according to the Commission, will pave the way for solutions that facilitate cross-currency instant payments.

Along these lines, settlement services offered by the Eurosystem; TARGET2, T2S and TIPS are providing a joint platform for settlement of payment and securities transactions not only for transactions in euro but also other curren-

cies, thanks to their built-in multicurrency functionality, with a potential for further development.

Also among market actors, activities to further develop cross-border and cross-currency payments are underway, e.g. the Nordic banks⁴, which are currently involved in a project to increase the efficiency in payment processing and clearing, by merging Swedish, Danish and Finnish clearing activities into one institution, called P27 [12]. The aim is to establish a pan-Nordic payment infrastructure for domestic and cross-border payments in the Nordic currencies and the Euro. The platform will initially allow payments to flow instantly between people and businesses within the countries of Denmark, Finland, and Sweden, but will be designed to be expandable allowing for payments across the rest of the Nordics as well.

On top of such investments initiated by the banking community, a cross-currency settlement service where payments are settled with a PvP settlement in a timeframe of a few seconds, might contribute to further support market activities. In addition, it could also ease the small and medium-sized banks concerns if they would be able to provide "real" instant payments without opening accounts with all Nordic central banks.

A cross-currency service as the one suggested might also provide the processing rails for the European Payment Initiative (EPI) if this was broadened to cover also non-euro currencies, including cross-currency payments. The EPI is a project launched by 16 major European banks from Belgium, France, Germany, the Netherlands and Spain with the ambition to create a pan-European payment solution based on the SEPA Credit Transfer Instant scheme. The EPI will focus initially on payments in euro but has invited also banks and other service providers from non-euro area countries to join the initiative and may consider to broaden the currency scope if supported by the respective banking communities.

Enhancing the efficiency of cross-currency payments has the potential to bring increased competition and related benefits for end users. In this respect, a cross-currency solution, leveraging on the multi-currency function and instant settlement in TIPS, can offer the banking industry an alternative to already existing payment solutions. Such a solution would enable market participants to limit their investments cost, to have a trusted provider and a reliable, secure and cost-efficient service, in central bank money. The availability of a cross-currency solution based on TIPS for non-euro countries could furthermore generate market demand from new markets, hereby strengthening the international role of the euro.

Banks already operating in the cross-border and cross-currency payments market would be benefited as well from a cross-currency instant solution. First, settlement in central bank money with immediate finality is safer – lowering

⁴ Danske Bank, Handelsbanken, Nordea, OP Financial Group, SEB and Swedbank

settlement risk - more efficient – and immediately available. Second, payments based on instant settlement would bring costs down since less manual interventions in the payment lifecycle would be needed. Third, harmonised processes can facilitate expansion for existing actors, as well as reduce market barriers to entry for new actors, which in turn might increase competition leading to a more efficient and less fragmented market, including improved services and prices for end-users.

Furthermore, straight through processing abilities for the payment industry can increase efficiency and entail cost reductions, by making manual interventions redundant. This should also make the system safer and more robust. For end-users, real time payments should be experienced as more efficient and reliable and should increase possibilities for the development of new services. This, in the end, would benefit both existing and new customers.

A cross-currency solution based on a European safe and efficient market infrastructure could furthermore contribute to enhance European influence and governance in payments, as well as providing EU market actors with an infrastructure for cross-currency payments in several currencies under EU-legislation on which further innovation could be developed. This would allow new services that address the high end-user needs and support financial inclusion, cross-border trade and travel.

10. Technical and operational considerations

This section describes the methodology proposed to assess and compare the different models identified for the three processing layers defined in 4.

In order to reduce the complexity of the analysis, the methodology is based on a phased approach considering the three processing layers one by one, before analysing them in combination. More in detail:

- **Phase 1:** the analysis focuses on single layers in sequence, i.e. the settlement layer, followed by the currency conversion layer and finally on the currency trading layer.
- **Phase 2:** the analysis reviews the results obtained out of Phase 1, by considering all the layers holistically, so to ensure all the relevant service requirements are identified and specified.
- **Phase 3:** the service requirements detailed in the previous phase are validated and possibly enriched and adjusted by taking into account any possible policy and legal input (see also 9 and 11).
- **Phase 4:** a gap analysis identifies all the differences between the *as-is* scenario (the current TIPS) and the *to-be* scenario (TIPS providing a cross-currency settlement service).

Within Phase 1, the methodology assesses and compares all the models identified for a given layer from a *functional*, *operational* and *technical* perspective, with the following objectives:

- *functional* perspective: to define the exhaustive list of features the cross-currency settlement service in TIPS shall provide;
- *operational* perspective, to identify the set of operational requirements for the cross-currency settlement service;
- *technical* perspective, to assess the actual feasibility of the functional features and operational requirements and to highlight the main cost drivers for the implementation of the cross-currency settlement service.

While performing this type of analysis, the methodology follows a modular approach in defining the solution to be implemented, i.e. it identifies all the features to be implemented and distinguish them between the core ones to be implemented anyway as part of a potential first release of the cross-currency settlement service in TIPS, and others that may follow at a later stage, within the scope of future releases.

Once the functional, operational and technical has been performed, Phase 1 goes on by assessing and comparing each model of each processing layer in terms of *Service Value*, which is based on the following dimensions:

- *Business Value*, i.e. the value offered to the users stemming from the set of developed functionalities for the given model;
- *Operability*, i.e. the operational robustness of the model, including not only the TIPS platform but also the other actors' viewpoint;
- *Reachability*, in order to assess whether the selection of one model may imply differences in the potential/effective reachability of the cross-currency settlement service actors;
- *Interoperability*, i.e. assess each model in the light of the potential interaction with other instant payment technical platforms;
- *Returned Value*, i.e. the value obtained by the Eurosystem as Service Provider by implementing a given model (e.g. its potential applicability for other purposes).
- *Settlement Risk*, aiming to assess the likelihood of settlement fails related to a given model.

The *Service Value* of a given model stems from a combination (e.g. weighted average) of the scores the same model obtained for each of the above listed dimensions of analysis.

Within Phase 2, the methodology combines the optimal models selected for the three processing layers and assesses them again, in order to validate them holistically, in the context of a fully-fledged solution for the provision of a cross-currency settlement service in TIPS. At this stage, it may happen that new findings may trigger Phase 1 again for

one or more than one processing layer, which may lead to select a different model for the concerned layer(s).

The main purpose of Phase 3, is to cross-check and validate the models selected for the different processing layers also from a policy perspective and a legal standpoint, which may lead again to the need for reassessing the optimal model for one or more than one processing layer, thereby triggering again Phase 1 and Phase 2, so to find a sound fully-fledged solution also in policy and legal terms.

Finally, once a given fully-fledged solution has undergone successfully the first three phases, Phase 4 identifies the detailed list of changes and enhancements that TIPS requires in order to implement said fully-fledged solution for the provision of a cross-currency settlement.

11. Legal considerations

Legal considerations are an integral part of any comprehensive analysis on the feasibility, and eventual implementation, of a cross-currency instant payment functionality. The purpose of this Section is to touch briefly on the main legal elements of relevance to the proposed cross-currency functionality (this being a matter of great complexity, a thorough and in-depth inquiry would be necessary yet it exceeds the remit of this paper).

The main assumption of the case here presented is that Central Banks would set up the cross-currency instant payment solution and provide the related service). In this respect, an analysis on whether such service would fall within the mandate of the providing Central Banks is warranted. Within the context of European Union law, the primary objective of the European System of Central Banks (ESCB) is to maintain price stability. In addition to this primary objective, the Treaty assigns certain basic tasks to the ESCB, one of which is to promote the smooth operation of payment systems (Article 127(2) TFEU). The Statute of the ESCB and the ECB elaborates further, in this respect, by stating that, '[T]he ECB and the national central banks may provide facilities⁵ ... to ensure efficient and sound clearing and payment services within the Union and with other countries [emphasis added]' (Article 22 of the Statute). Neither the Treaty nor the Statute distinguish between wholesale and retail payments⁶, nor between payments in specific currencies, whether those of the Eurozone/EU Member States

⁵ The notion of the provision of 'facilities' is fairly broad, and it is not limited to the provision of payment systems.

⁶ EU law contains no definition of 'retail payments.' Regulation (EU) No 260/2012 of the European Parliament and of the Council of 14 March 2012 establishing technical and business requirements for credit transfers and direct debits in euro (the 'SEPA Regulation') rather defines a 'retail payment system' as 'a payment system the main purpose of which is to process, clear or settle credit transfers or direct debits, which are generally bundled together for transmission and are primarily of small amount and low priority, and that is not a large-value payment system'.

or those of third countries, meaning that all types of payments (wholesale as well as retail, irrespective of the currency of their denomination), payment systems, payment instruments (credit transfer, direct debit or card payment) and payment arrangements may fall within the scope of the Eurosystem's mandate. It follows that there is nothing in either the letter or the spirit of the primary EU law, as the latter relates to Eurosystem's tasks in the field of payment systems, that would, a priori, preclude the legality of the inclusion of a cross-currency settlement functionality in TIPS,⁷ not least because the latter is, by design, a multi-currency platform. As such, while TIPS was construed with the primary aim to offer settlement in instant payments in euro, the technical implementation of TIPS is currency agnostic in its design, meaning that TIPS could support settlement in non-euro central bank money as well.⁸

Moreover, this functionality appears to be fully in line with the role that the ESCB has to play, where necessary and appropriate, as catalyst in the introduction of a new payment technology, as well as with the achievement of the European Capital Markets Union, by fostering market cohesion through the promotion of a pan-European instant payment solution.⁹

A further element of the legal analysis is to assess the risks that might be associated with the envisaged cross-currency instant payment service. In this regard, it bears noting that TIPS, though inherently a retail payment system, has been established within the legal perimeter of TARGET2, which is a Systemically Important Payment System (SIPS), with the meaning of the SIPS Regulation. [13] The latter implements into directly applicable law the Principles for Financial Market Infrastructures (PFMIs). [14] In its oversight practice, the ECB has treated TIPS as a SIPS and, also, as a "system", with the meaning of the Settlement Finality Directive (SFD).¹⁰ As a result, the proposed cross-currency instant settlement solution would need to be assessed against the SIPS Regulation (for instance, in terms, of its Legal Soundness, Governance, Money Settlement, Operational Risk, Efficiency and Effectiveness). While a comprehensive analysis of TIPS against the SIPS Regulation would exceed the objective of this paper, it bears noting that this assessment cannot be performed *in abstracto*, and that both the risks identified and their mitigation need to be based on a detailed technical solution, which, at present, represents work in progress.

⁷ This is despite the fact that the link between the mandate of the Eurosystem and the provision of a cross-currency settlement service through TIPS would, arguably, be stronger where one of the two currencies involved in a cross-currency payment would be the euro.

⁸ See TARGET Instant Payment Settlement User Requirements (Scope of the Service) [11].

⁹ See *Ibid.*, (1.1 Background).

¹⁰ See definition of "system" laid down in Article 2(a) of the SFD.

However, even within the limits of the present considerations, the importance of Principle 9 ('Money settlements') of the PFMI cannot be overlooked. According to it, "an FMI should conduct its money settlements in central bank money where practical and available. If central bank money is not used, an FMI should minimise and strictly control the credit and liquidity risk arising from the use of commercial bank money". In this context, it should be recalled that the settlement foreseen by both TIPS and RIX-Inst is conducted in central bank money, and this entails that such settlement gives rise to no credit and liquidity risk. This aspect is independent on the technical solution, since settlement in central bank money is part and parcel of the functioning of the two services that are going to be interconnected. While TIPS will support, as of November 2021, also the internal settlement of instant payments offered by Automated Clearing Houses in commercial bank money (by hosting their technical accounts on the platform), it would under all circumstances ensure that cross-currency transactions would be reflected, on a gross basis, in the positions in central bank money [15].

Last but not least, an element that is fundamental from a legal point of view in connection with the provision of cross-currency settlement in two services, which are part of two different 'SFD-designated systems' (TARGET2 and RIX) with separate legal perimeters, is the finality of payment transactions. In this regard, the SFD sets out three different moments that play a crucial role in the enforcement of finality rules in an 'SFD-designated system': the moment of entry (SF I), the moment of irrevocability (SF II), and the moment of finality of transfer orders (SF III). In case of interoperability among services of different systems (as between TIPS and RIX-INST), coordination is warranted as to clarify which rules apply to the moment of entry and irrevocability of payment transfer orders. In other words, contractual arrangements need to be put in place to guarantee that there are common rules for the different moments of settlement finality, defined by the interoperable systems, in order to avoid, insofar as possible, the risk of legal uncertainty.¹¹ A separation of a cross-currency transaction into two transactions, each of them only valid in one service (connected by means of a PvP mechanism), would most probably facilitate this task, considering that the double conditional settlement would be enforced via technical design. However, once again, this stresses the importance of legally assessing the concrete technical solution once this has been devised.

12. Conclusions

The multi-currency features of TIPS have the potential of enhancing efficiency by reducing the number of connections for cross-currency payments, as well as providing instant settlement in central bank money. In other words they can work as building blocks of a larger network, that would

otherwise be technically much more challenging. At the same time they serve the policy needs of the involved central banks, by referring to the pivotal role of central bank money. So, in this respect, the aim of the joint Eurosystem and Riksbank project is not to provide yet another market infrastructure: it ultimately aims at filling a gap currently existing in the market and providing a more sound and efficient payment system for the benefit of society, at the same time promoting also a deeper level of cooperation among central banks in Europe. A cross-currency solution that hinges on TIPS might also contribute to strengthening the international role of the euro and could contribute to the attractiveness of TIPS for non-EU currencies.

Once the optimal solution for the three processing layers described in this paper has been found and a potential cross-currency settlement service in TIPS has been outlined, the following step of the analysis would be to investigate, in line with building block 13 and 17 of the G20 global roadmap for enhancing cross-border payments (concerning the interlinking of payment systems), possible options for the cross-currency settlement of instant payments between two distinct instant payment systems.

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