T2S CROSS-BORDER MARKET PRACTICES SUB-GROUP (XMAP)

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FINAL

EVALUATION OF
T2S OPTIONAL MATCHING FIELDS

Executive summary

The Cross-Border Market Practices Sub-Group (XMAP) has conducted an analysis on optional matching fields with objectives to analyse of impact of T2S market practice on (a) maximisation of settlement matching rates and (b) minimisation of cross-matching.

The analysis consists of an introduction of different concepts related to matching and a theoretical analysis on how the matching rate and cross-matching are impacted by different combinations of Matching Fields. In the analysis the three T2S Optional Matching Fields -Common Trade Reference, Client of CSD Participant, Securities Account, have been evaluated against three criteria of uniqueness, standardisation and availability. Further, impact of changing the Optional Matching Fields into mandatory, optional with a default value or additional has been assessed.

Based on the fact that the use of Optional Matching Fields would not prevent cross-matching and the fact that making mandatory fields that are not available in all cases creates an operational burden, the XMAP acknowledges that the most appropriate change would be to define the Optional Matching Fields as additional. However, the XMAP considers that with no experience on the usage of the matching fields in T2S there is not sufficient information available to propose a change that would help achieving the objective to reduce cross-matching without affecting matching efficiency. In this situation, the XMAP also recognises the need to set best practice on the use of the Optional Matching Fields to in order to avoid the risk of diverging practices across markets joining T2S on if and how these fields are used. For that purpose, the XMAP recommends that:

- in case any party in the instruction chain provides content for one or several of the three optional matching fields, this information should not be suppressed by one of the next parties in the chain.

- when used, optional matching fields should be filled in with standardised manner

  o Common trade reference is either bilaterally agreed or provided by a central infrastructure (e.g. trading platform or central counterparty).

  o Client of CSD Participant is populated by a BIC (when the client is eligible for a BIC).

- o Securities Account of the Delivering / Receiving Party is always populated by the T2S Securities Account.

To facilitate conducting an analysis on the usage and impact of optional matching fields after launch of T2S, the XMAP recommends that work should be launched to define appropriate metrics to measure the matching rates, including the cross-matching rate. These metrics should be available on time in order to allow assessing the usage of the optional matching fields and their impact on successful matching and cross-matching rates by comparing these rates prior and after the migration to T2S.

Contents

1. Objective and Scope

The objective of this paper is to analyse the feasibility to define a single T2S market practice for the use of T2S optional matching fields with the aim of achieving the dual objectives of (a) maximisation of matching[1] rates, i.e. to increase matching efficiency and (b) minimisation of cross-matching.

In order to achieve this objective, this paper includes:

- analysis of the factors influencing matching efficiency and cross matching (see definitions in section 2.1);

- the establishment of the evaluation criteria for matching fields;

- the evaluation of each T2S optional matching field against the evaluation criteria

2. Matching Rates versus Cross Matching Rates

To achieve the HSG dual objective of (a) maximisation of matching rates and (b) minimisation of cross-matching, there is a need to adopt a holistic approach and balance the objectives; questions remain on the criticality and significance of matching rate vis-à-vis cross matching rate.

Higher matching rates do not directly correlate to higher settlement rates, but since matching is a pre-requisite for settlement of securities transactions, increase of matching rates can initially be considered as a primary focus compared to decrease of cross matching rates. However, matching rates can be expected to increase with time, as users gain better understanding of these market practices in cross-border context. Furthermore, it is to be reminded that in a case of 100% settlement rate, cross matching has no effect and to be detected need to have at least one instruction involved in the cross matching which fails to settle.

On the other hand, cross matching is perceived as a lower priority issue as long as matching rates and settlement rates are maximised. In fact instances of cross matching are infrequent and difficult to identify. Also, there are no standard approaches for identifying cross matching issues and most cases are detected post settlement, which makes the resolution of these cases critical and difficult. However, since cross matching issues are caused by inefficiency of matching criteria used rather than the lack of experience in market practices, the focus of single T2S market practice for the use of T2S optional matching fields should be to build an effective tool for reducing cross matching rates and maintain (if not improve) the same level of existing matching rates.

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[1] References to matching in this note refer to matching settlement instructions

3. Theoretical Analysis of Matching Fields

3.1 Definitions

This section includes the definitions of some relevant terms frequently used when matching efficiency is discussed. The objective would be to eliminate any ambiguity on the scope and usage of these terms in the context of T2S optional matching field evaluation.

- *Matching* – According to the ECB glossary,[2] matching is the process used for comparing the trade or settlement details provided by parties in order to ensure that they agree on the terms of the transaction.

- *Matching Field* – represents an attribute of the settlement instruction that forms the basis for comparing two settlement instructions to identify counterparty's matching instruction.

- *Matching Rate (MR):* represents the ratio of **all matched** instructions to the overall instructions requiring matching.

- *Matching Fail Rate (MFR)* – represents the ratio of settlement instructions that do not match, despite both counterparties having sent their respective instructions, because there is a discrepancy in the matching criteria used, to the overall instructions requiring matching.[3] In analytical terms, *MR + MFR = 1*.

- *Successful Matching Rate (SMR)* – represents the ratio of instructions that are **matched correctly** to the overall instructions requiring matching.

- *Cross Matching Rate (CMR)* – This term represents the ratio between the number of instructions **incorrectly** matched (i.e. matching of instructions between non-transacting counterparties or between incorrect final beneficiaries) and the number of overall instructions requiring matching.. Cross matching can be the effect of the usage of non-discriminatory criteria (matching fields) during the settlement instruction generation process. In analytical terms, *SMR + CMR = MR*.

- *Early Matching Rate* – represents the number of instructions already matched correctly before the intended settlement date. This includes settlement instructions matched on or shortly after the trade date (T and T+1), as well as one day prior to the intended settlement date (ISD – 1). There is no unanimously accepted deadline for defining when matching can be defined as early matching.

- *Settlement Rate* – represents the ratio of the settled instructions to all validated settlement instructions. The settlement efficiency can be measured based either on the value or on the volume of these instructions.

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[2] Reference-http://www.ecb.europa.eu/home/glossary/html/glossm.en.html, accessed on 23 October 2013

[3] Matching can also fail if the counterparty does not send the required settlement instruction. However this scenario is not the focus of this note.

3.2 Principles of Matching Settlement Instructions

From a purely theoretical perspective, the two objectives of *SMR* maximisation and *CMR* minimisation are conflicting in nature.

Using the number of matching fields as the reference for comparison, the following statements can be made:

- Decreasing the number of matching fields will result in an increase in matching rates (MR) and vice versa. This is primarily due to the fact that a smaller number of matching fields may result in potentially greater number of settlement instructions satisfying the matching fields, thereby increasing the probability of matching occurrences. This effectively means that MR is inversely proportional to the number of matching fields.

- Decreasing the number of matching fields will result in an increase in cross matching rates (CMR) and vice versa. This is primarily due to the fact that a smaller number of matching fields may result in potentially greater number of settlement instructions satisfying the matching fields, thereby increasing the probability of cross matching occurrences. This effectively means that CMR is inversely proportional to the number of matching fields.

The following graphical representation clarifies the relationships between each of these variables and the number of matching fields (Figure 1). The numbers used are purely indicative.

Figure 1: Relationship between *SMR*, *CMR* and *MFR*, with respect to the number of matching fields
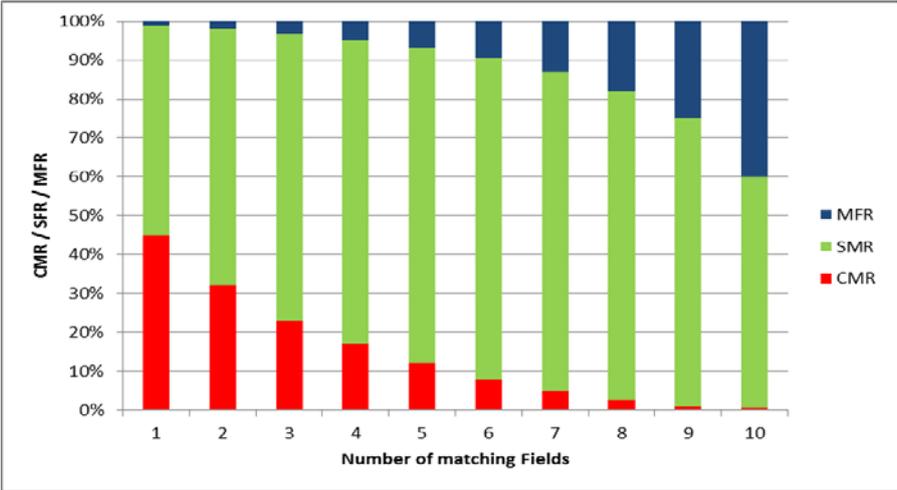
**Table 1: Relationship between *SMR*, *CMR* and *MFR*, with respect to the number of matching fields**

NoMF	SMR	CMR	MR = SMR+CMR	MFR	Total Inxs
1	54	45	99	1	100
2	66	32	98	2	100
3	73.7	23	96.7	3.3	100
4	78	17	95	5	100
5	81	12	93	7	100
6	82.5	8	90.5	9.5	100
7	82	5	87	13	100
8	79.5	2.5	82	18	100
9	74	1	75	25	100
10	59.5	0.5	60	40	100

In this simplistic model the following statements can be made:

- a decrease in the number of matching fields will result in a higher overall matching rate, but also cross matching will become more likely (*CMR* will potentially increase);

- an increase in the number of matching fields will potentially reduce the overall matching rate, and also successful matching will become harder (*SMR* will potentially decline);

- in graphical terms, the challenge will be to increase the number of matching fields up to the point where the green-coloured area (*SMR*) is maximized, i.e. where the benefits in the reduction of cross-matching are no longer offset by a decline in the overall matching rate. In Figure 1 above this point is reached at 6 matching fields, corresponding to the highest successful matching rate;

- the practical challenge will be to selectively add matching fields that contain the risk of cross matching while allowing better chances of successful matching ; this will depend on the qualitative nature of each matching field,.

In practice, any combination of matching fields will result in a given MR and CMR which can be represented on the two-axis graph as a single point (Figure 2).

**Figure 2: Matching Rate and Cross Matching Rate**
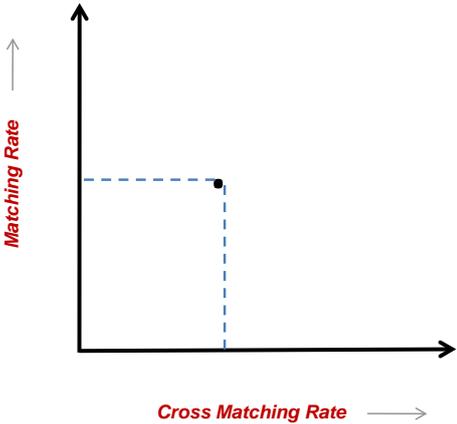
With an objective to increase the MR, a decrease in the number of matching fields will push this point to move in the upward direction and result in an increase in the CMR. Figure 3 depicts the relationship between the y axis (MR) and x axis (CMR) due to the decrease in the number of matching fields. A steeper line (curve A in green) is preferred because for every unit increase in MR, the increase in CMR is minimal (compared to grey curve B). A steeper line is achievable if MR is more sensitive than the CMR to the removed matching field (i.e. if it is possible to remove a matching field that is affecting the MR more than it affects the CMR).

Figure 3: Impact of Decrease in Matching Fields on Matching Rate and Cross Matching Rate
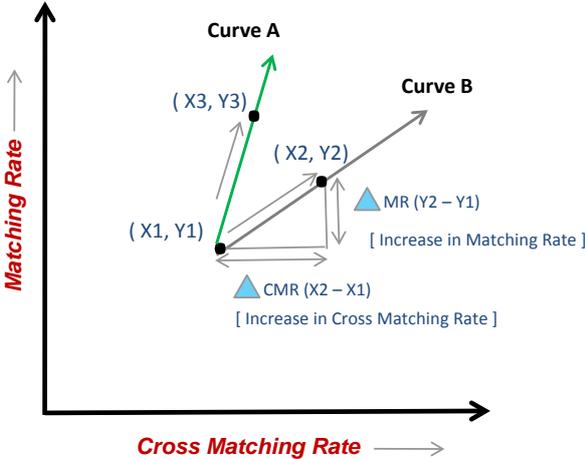
However, with an opposite objective, i.e. to reduce the CMR, an increase in the number of matching fields will push this point to move in the downward direction and result in a decrease in the MR, too. Figure 4 depicts the relationship between the y axis (MR) and the x axis (CMR) due to the increase in the number of matching fields. A flatter line (curve A in green) is preferred to a steeper one because for every unit decrease in MR, the decrease in CMR is maximised (compared to curve B). A flatter line is achievable if CMR is more sensitive than the MR to the added matching field (i.e. if it is possible to add a matching field that is affecting the CMR more than it affects the MR).

Figure 4: Impact of Increase in Matching Fields on Matching Rate and Cross Matching Rate
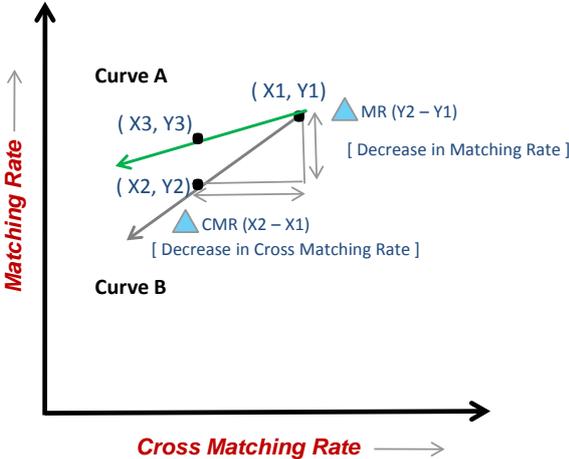
Based on this analysis and in order to predict the impact ("quality") of specific matching fields on *MR*, and respectively on *SMR* and *CMR*, it is very important to define criteria to evaluate the matching fields and assess their influence on *MR*, *SMR* and *CMR*. However, considering that such impact analysis can only be made in qualitative terms (since any ex-post real-life or statistical measures would require very complex and impractical simulations), it is difficult to move this purely theoretical analysis into practically measurable scenarios at this stage.

3.3 Matching Fields Evaluation Criteria

In order to assess the quality of the matching fields, i.e. to measure how they contribute to the two objectives of maximising matching efficiency (maximising *SMR*) and minimising cross-matching, we need to define the relevant evaluation criteria.

While cross matching is primarily the result of the use of non-discriminating matching fields, the matching fails can be attributed to the mismatch of counterparty instruction details due to incorrect or missing data (i.e. the information required for filling in the matching fields). This can be the result of the use of non-standardised data or data that cannot be readily available to the counterparty as matching fields. Based on these factors, the *Matching Fields Evaluation Criteria (see Table 1)* can been defined below.

Table 1: Description of Matching Fields Evaluation Criteria

Evaluation Criteria	Description
Uniqueness	The data for filling the matching field is discriminating enough to differentiate instructions and uniquely identify the counterparty instruction.
Standardisation	The data for filling the matching field is used in a standardised and harmonised format by the counterparties.
Availability	The data for filling the matching field can be readily available to the counterparties at the time of settlement instruction input

4.   Evaluation of T2S Optional Matching Fields

From the T2S perspective, since the number of mandatory matching fields is endorsed by the T2S community (at least for the first release of T2S), the quality of T2S optional matching fields becomes critical to ensure that for a given level of *MR*, the *SMR* value is maximized and the *CMR* value is minimised. Hence, the evaluation of the current T2S optional matching fields is important before analysing and defining any potential T2S market practice on the usage of T2S optional matching fields.

4.1   T2S Optional Matching Fields – Overview

Currently, the T2S matching fields list encompasses different types of fields, namely *mandatory* and *non-mandatory* matching fields.[4] Non-mandatory types are further differentiated into *additional* and *optional* matching fields.

Usage of additional matching fields is not mandatory but their values have to match when one of the counterparties provides a value for them in its instruction. Consequently, once an additional matching field is filled in by a party, the counterparty should also fill it, since a filled-in field cannot match to blank.

For optional matching fields, a filled-in field may match with a field with no value (unlike the additional matching fields), but when both T2S Parties provide a value, the values have to match. The optional matching fields in T2S are listed below:

- Common Trade Reference
- Client of CSD Participant (Delivering Party / Receiving Party)
- Securities Account (Delivering Party / Receiving Party)

Figure 2: T2S Optional matching fields *(Source: UDFS1.2.1 – Section 1.6.1.2.3 Matching process)*

NON MANDATORY MATCHING FIELDS PER TRANSACTION TYPE
TABLE 112 – OPTIONAL MATCHING FIELDS AND EXAMPLE

e.g. Matching of Optional Fields:

DVP/DWP	FOP		SETTLEMENT INSTRUCTION 1		SETTLEMENT INSTRUCTION 2
Common Trade Reference	→	25689	MATCH	25689
Client of delivering CSD participant	→	BANKCCLLMAR	NO MATCH	BARCGB210ZS
Client of receiving CSD participant	→	BSCHESMMXXX	MATCH	(blank)
Securities account of the delivering party	→	12514	MATCH	12514
Securities account of the receiving party	→	56541	NO MATCH	89852

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[4] *UDFS1.2.1 – Section 1.6.1.2.3 Matching process*

Due to the nature of the T2S Optional Matching Fields and the fact that a non-blank value can match with blank value, in the absence of market practice, these matching fields have a very limited effect on the matching rate or cross-matching rate, as matching can still occur irrespective of the way they are filled in. In order to influence the different matching rates (MR, MFR, SMR and CMR), it would be more meaningful to either change the nature of these matching fields or to establish a common market practice for usage of these fields.

4.2 Redefinition of T2S Optional Matching Fields – Key Concepts

In order to influence the different matching rates (MR, MFR, SMR and CMR), the options with regard the T2S Optional Matching Fields are the following:

- Option 1: Conversion from 'Optional Matching Fields' to 'Mandatory Matching Fields'

According to this option, a T2S Optional Matching Field will be defined as Mandatory Matching Field in T2S. As a consequence, this option will make it mandatory for the users to input the values for the optional matching field in the settlement instruction for all the business scenarios and across all markets irrespective of the availability and relevance of the data. For example, the matching field 'Common Trade Reference' (CTR) is a unique identifier of transaction between two counterparties and serves as an appropriate matching criterion to filter counterparty instructions and match relevant counterparty instructions. However, the relevance and availability of the data for this matching field is limited to specific business scenarios such as stock exchange transactions cleared by CCP. Similarly the data for the matching field 'Client of CSD Participant' may not be available in case no client of the CSD Participant is involved in the transaction. This option will force the users to input fictitious values for the matching fields in cases where the matching field does not make business sense. As a result, this option creates operational burden and inefficiencies.

- Option 2: Conversion from 'Optional Matching Fields' to 'Optional Matching Fields with Default'

According to this option, the T2S Optional Matching Fields will be used by the T2S market in a way that makes these fields mandatory in all business scenarios. Both the parties to a transaction will have to provide either a specific value for these fields, in case they are available and relevant for the specific business scenario, or a predefined default values, in case the field is not relevant. This option will have the advantage of avoiding the current issue of possible matching with blank of the T2S Optional Matching Field and will result in reducing the likelihood of cross-matching. However, in practice, this option creates the same negative effects as Option 1 because it forces the users to input the values for the optional matching fields in the settlement instruction for all the business scenarios and across all markets irrespective of the relevance of the matching field.

- Option 3: Conversion from 'Optional Matching Fields' to 'Additional Matching Fields'

According to this option, the T2S Optional Matching Fields will be used by the T2S market as Additional Matching Fields. This means once the matching field is filled in by one party, the

counterparty should also fill it, since a filled-in field cannot match to blank. This option allows the flexible usage of a matching field according to the business context and does not create the burden of managing fake or fictitious values when the fields are not relevant.

Based on this analysis, the most appropriate action would be to define the optional matching field as additional matching field or to avoid using these fields as matching criteria. The question remains to identify the fields that have to be made additional and those that can be removed from the matching criteria based on how they are expected to influence the matching rate.

4.3   Evaluation of T2S Optional Matching Fields

Based on the criteria defined in section 3.3, the below table presents the analysis conducted for the evaluation of each T2S optional matching field and conclude on the suitability of the matching field usage for minimising *CMR* and maximising *SMR* and the overall *MR*.

Table 2: Analysis of T2S optional matching fields against evaluation criteria

Evaluation Criteria	T2S Optional Matching Fields		
	Common Trade Reference	**Client of the CSD Participant**	**Securities Account**
Uniqueness	Yes	Partial	Partial
Standardisation	No	Partial	Yes
Availability	Partial	Yes[5]	Yes

- Common Trade Reference

    o Common Trade Reference is a unique identifier (generated either automatically or manually) of a transaction between two transacting counterparties and included in the counterpartys' settlement instructions. Use of this unique identifier as a matching field avoids cross matching with other settlement instructions between the same transacting counterparties.

    There is no EU wide industry standard agreed and endorsed by market participants for common trade reference (no standardisation). The format varies across markets and each institution may have developed a distinct codification for common trade reference based on the processing needs of the market and/or the financial instrument. Common trade reference is not readily available for all business scenarios (i.e. transaction types) and varies due to different sources of settlement transactions (exchange/CCP based or OTC / bilaterally input) and diversified market specific practices. This matching field is discriminating enough (i.e. fulfils the uniqueness criterion) to

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[5] For both 'Client of CSD Participant' and 'T2S securities account' as matching fields, it has been assumed that the counterparties will make this information available to each other.

identify the counterparty's correct instruction for matching and serves as a good tool for CMR minimisation. However, due to no standardisation and partial availability of this data for some transaction types only, the negative impact on *SMR* (i.e. decrease in *SMR*) may be significant.

- Client of CSD Participant

    o The identifier of the client of CSD participant helps to uniquely identify the counterparty settlement instruction in case multiple settlement instructions from different clients under the same CSD participant exist in the system. However, in case of multiple identical settlement transactions between two clients of the same CSD participant, the use of this matching field does not prevent cross matching.

    o T2S community has agreed to use BIC as a standard tool for T2S party identification. The XMAP is of the opinion that the use of BIC is crucial in a cross-border context in order achieve standardisation and avoid matching issue. Therefore, it is important that BIC are requested and used in the details of the T2S settlement instructions whenever an entity is eligible for a BIC. The client of a CSD participant can be categorised as either retail or institutional clients (includes non-financial institutions). Since the retail clients as well as non-financial institutions are unlikely to have BIC(s), alternate formats have to be used for their codification compared to other institutional clients that have a BIC. The use of different codification formats for different categories of clients of CSD participants prevents the adoption of a single standard.

    o Irrespective of the format of codification, this matching field is readily available (i.e. CSD participants will always know who their clients are) and can be included in the settlement instruction provided it is made available to the counterparties.

The inclusion of this matching field does not prevent cross matching totally, because it does not support the unique identification of counterparty's instruction in all business scenarios. Although the data for this matching field is readily available for all categories of client of CSD participants, the lack of harmonisation across client categories may result in incorrect data input and an increase of matching fails.

- Securities Account of the Delivering / Receiving Party

    o The securities account identifier helps to uniquely identify instructions originating from a specific securities account of a CSD participant (i.e. T2S Party). However, the avoidance of cross matching depends upon the CSD account structure and segregation of holdings at the level of T2S Party. In omnibus account structure, there may exist multiple settlement instructions on the same account with similar settlement details. In such scenarios, this matching field does not serve as good filter criteria for preventing cross matching.

- o The T2S securities account identifier is a standard format for securities accounts across all CSD participants

- o The T2S securities account identifier of the counterparty can be specified during the input of a settlement instruction provided transacting counterparties make this information available to each other.

The presence of standard formats for identification of securities accounts and relative ease of availability of information with the counterparties will support *SMR* maximisation. However, the shortcomings in uniqueness may not prevent cross matching.

4.4 Conclusion

Based on the evaluation of options to change the optional matching fields into mandatory, additional or optional with default value, the most appropriate action would be to define the optional matching field as additional matching field or to avoid using these fields as matching criteria. However, the evaluation of the current T2S optional matching fields based on qualitative criteria yields that none of the individual fields or their combination can be used suitably to define a single T2S market practice to achieve the objective of reducing cross matching while not affecting matching efficiency.

In addition, in the absence of a thorough analysis to assess the impact of the matching field in the T2S environment on the matching and cross matching rates, it is difficult to ascertain whether some or all the optional matching fields should be made additional because the changes may introduce operational burden and inefficiencies.

To establish a common understanding of key matching concepts in the T2S community, there is a need for defining the metrics and methodology for calculation of cross matching. Such metrics will facilitate the assessment of the magnitude of cross matching issue.

The T2S community can adopt a long term view to monitor the evolution of the T2S markets practices in the T2S environment and assess at a later stage the actual usage of the T2S optional matching fields based on the T2S "production" experience. In concrete terms the XMAP recommendation is to launch the work on this perimeter with the aim to have the key concepts defined and available before T2S goes live. To be able to have data comparable to post-T2S go-live period statistics on the matching field usage will be required also from the pre-T2S period.

In the meantime, market developments may move in the direction of achieving standardisation of certain matching fields.

For example:

- Market trends may lead to the definition of a universal identifier (e.g. the LEI or other) that could be used as standard format for representing clients of CSD participants and overcome the current shortcomings of the "Client of CSD Participant" as matching field.

- Account structure and segregation of holdings may undergo changes due to regulatory initiatives or other market needs and overcome the current shortcomings of the Securities Account of the Delivering / Receiving Party as matching field.

Such market developments will help in assessing the need and identification of the appropriate matching field(s) to achieve the objectives of matching rate maximisation and cross matching rate minimisation in T2S.

There is obviously a risk that different markets would adopt different practices on how the fields are used. This may make harmonisation of the fields more problematic in the future. This may result in additional burden on the side of the market participants to adapt to the non-harmonised market practices post-T2S. On the other hand, forcing the market to adopt and implement certain settlement practices without experiencing the T2S platform can result in unforeseen complexities and process inefficiencies.

In the meanwhile, In order to avoid that the current situation results in an inefficient matching process, the XMAP recommends adopting a principle that:

- in case any party in the instruction chain provides content for one or several of the three optional matching fields, this information should not be suppressed by one of the next parties in the chain.

- optional matching fields are filled in with standardised manner

    o Common trade reference is either bilaterally agreed or provided by a central infrastructure (e.g. trading platform or central counterparty).

    o Client of CSD Participant is populated by a BIC.

    o Securities Account of the Delivering / Receiving Party is populated by a T2S Securities Account identifier.