



## *CMI in Focus: Pre-matching and Matching Processes*

Matching is the process that compares the instructions which are provided by the counterparties for settlement, and forms part of the 'clearing' process (i.e. the administrative processes between trade execution and settlement). This ensures that the terms of the transaction are correct before the instructions are sent for settlement. As a result, efficient matching is an essential step to mitigate liquidity risk as it reduces the risk of failed trades. The matching process is typically automated for on-exchange trades where the instructions are entered in the trading system that links to the CSD settlement system; however, the process is usually more complicated for OTC trades where bilateral input at the CSD level is required.

### *General Description*

Matching is the process of comparing settlement details in order to ensure that they meet the terms of the transaction. Usually an electronic system will automatically allocate the details of volume and price with the corresponding orders. Matching can be single-sided (i.e. one counterparty enters the instruction, the other affirms it) or dual-sided (i.e. both counterparties enter instructions which should be virtually identical).

There are two general groups of transactions which require matching in different ways; 'market-side' (i.e. on-exchange) transactions where matching is conducted between buyers and sellers (i.e. brokers) within the stock exchange), while OTC transactions, including 'client-side' settlements, where matching is conducted between brokers and custodians, or even by brokers, custodians and the underlying investors.

### *Market-side*

For market-side transactions, matching between brokers is done automatically at the stock exchange and fed down to the CSD. The buyers and sellers enter their bids and offers into the exchange system, the exchange system (or a market maker if it's a quote-driven system) will search for a counteroffer / counterbid, and then will allocate the closest buyer and seller together according to the conditions of the trade. The exchange system sends all the matched transactions to the CSD.

The CPSS-IOSCO recommendations for Financial Market Intermediaries (FMIs) repeated the 1989 G30 recommendations on matching for on-market and client –side transactions stating that "Confirmation of trades between direct market participants should occur as soon as possible after trade execution, but no later than trade date (T+0). Where confirmation of trades by indirect market participants (such as institutional investors) is required, it should occur as soon as possible after trade execution, preferably on T+0, but no later than T+1".



In this respect, trade confirmation systems have increasingly become automated as most markets already have in place systems for the automatic comparison of trades between direct market participants. In many markets, the use of electronic trading systems obviates the need for direct market participants to match the terms of the trade, achieving Straight Through Processing (STP). Automated matching systems are also being proposed and implemented for trade confirmation between direct market participants and indirect market participants and for the matching of settlement instructions. Automation improves processing times by eliminating the requirement to send information back and forth manually between parties and by avoiding the errors inherent in manual processing.

## Client-side

Client-side matching is normally done outside of the stock exchange. The client has to deliver securities to the broker, if it is a sell transaction or the cash to the broker if it is a buy transaction. As part of this settlement process, it is important to match the details of what the client has to deliver to the broker, against what the broker actually transacted on the stock exchange. Clients' settlement instruction details can be matched to brokers' contract notes to ensure that the transaction was executed correctly. Brokers get an order confirmation from the stock exchange, and send a copy of the confirmation to the sub-custodian, who will match it against the instruction that their client has sent.

Some markets do not have client-side matching. This leads to problems such as brokers executing transactions differently from the client's instruction, normally for their own benefit; hence it is a very important control mechanism.

Electronic matching is usual practice, for on-exchange trades as virtually all exchanges use electronic trading systems now. In case of OTC transactions, however, there is normally no inherent electronic trading system in the middle but some depositories have developed electronic matching engines for client-side matching, e.g. in Japan, Spain and Norway via 'Central Matching Utilities' (CMU) which are discussed later.

## Pre-Matching

In many markets, when two instructions match in a system, the transaction becomes irrevocable which enforces a legal commitment on the counterparties to attempt to settle the transaction (which they may not be ready for). The other issue is that if the two instructions do not match, it will be generally be regarded as a failed transaction, and depending on market rules, the counterparties may be liable for fines or other punitive action.

The solution for these issues is pre-matching, essentially where the counterparties to the transactions conduct a dummy run of the matching. This will result in a high degree of certainty that the details are going to match when input into the settlement system. Pre-matching can be done electronically (e.g. using 'Hold and Release')

functionality in the matching system) via a CMU, but is still often done manually by telephone or fax leading to operational risk exposures.

## Central Matching Utility

Unlike the manual client-side matching and pre-matching models, where trade verification is bilateral by fax/telephone, in a risky and time-consuming process, electronic central matching allows investment managers and broker/dealers to input the data independently and separately into a CMU, where the information is then centrally validated and matched.

CMUs can be structured within the CSD, the CCP or via third party solutions (e.g. Omgeo), to automate trade allocation, confirmation and matching/affirmation of settlement instructions which form part of the 'clearing' process.

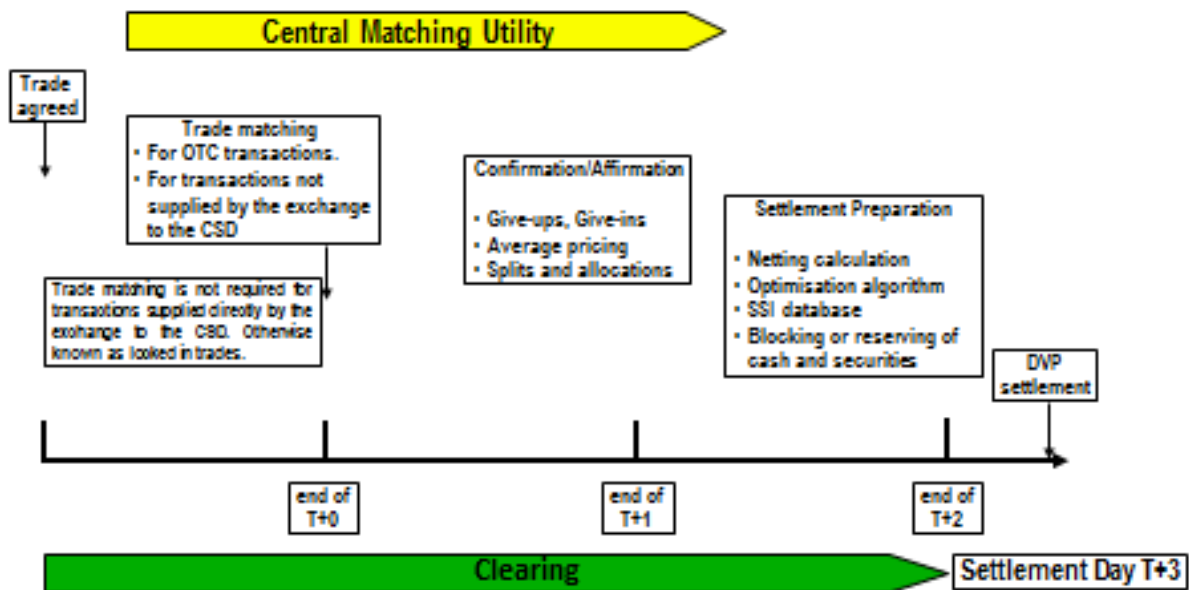


Figure 1: Components of Clearing Process

This process is complicated, particularly where there are many participants and substantial cross-border flows from different time zones, and final settlement can only be straightforward if all elements of the clearing process

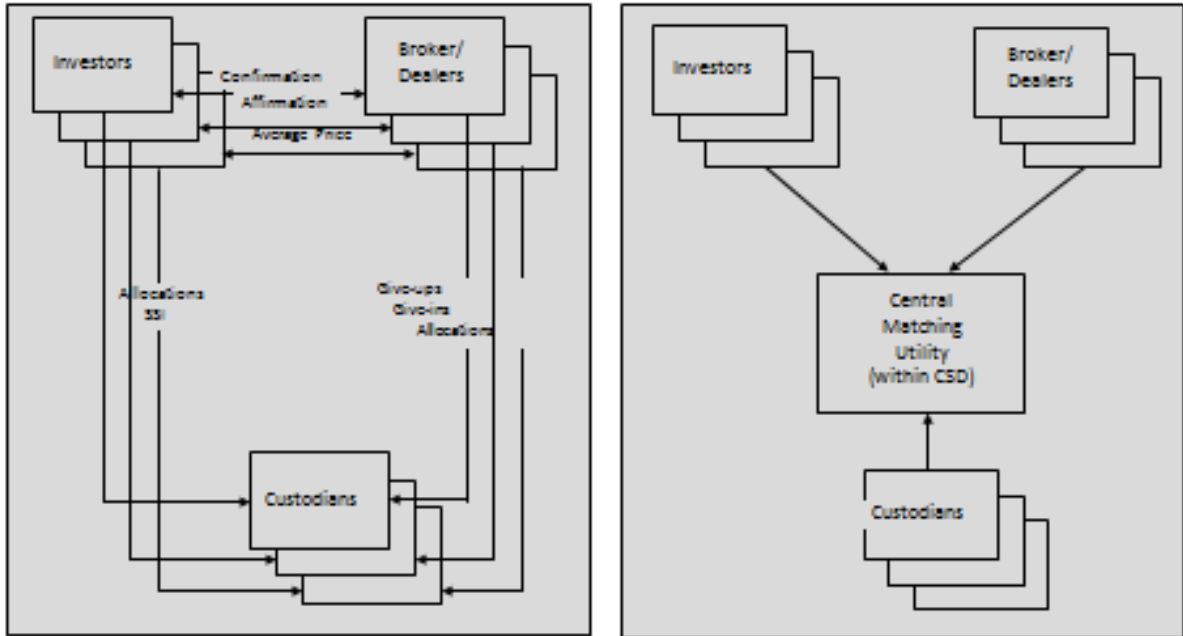


Figure 2: Central Matching: Single Point of Access

The above diagram shows the model for communication flows within this part of the clearing process with the traditional bilateral communication model on the left, and the CMU model on the right. Without a CMU, each investor needs to maintain a link with every broker they use and every custodian. Similarly each broker needs to maintain a link with every investor and custodian. This requires multiple bespoke links. With a CMU, each investor, broker and custodian maintains only one standard link into the CMU, which provides all the confirmation, affirmation and matching functions centrally for the whole market. With a SWIFT link, the CMU can also capture cross-border transaction details directly from foreign entities.

## Best Market Practice

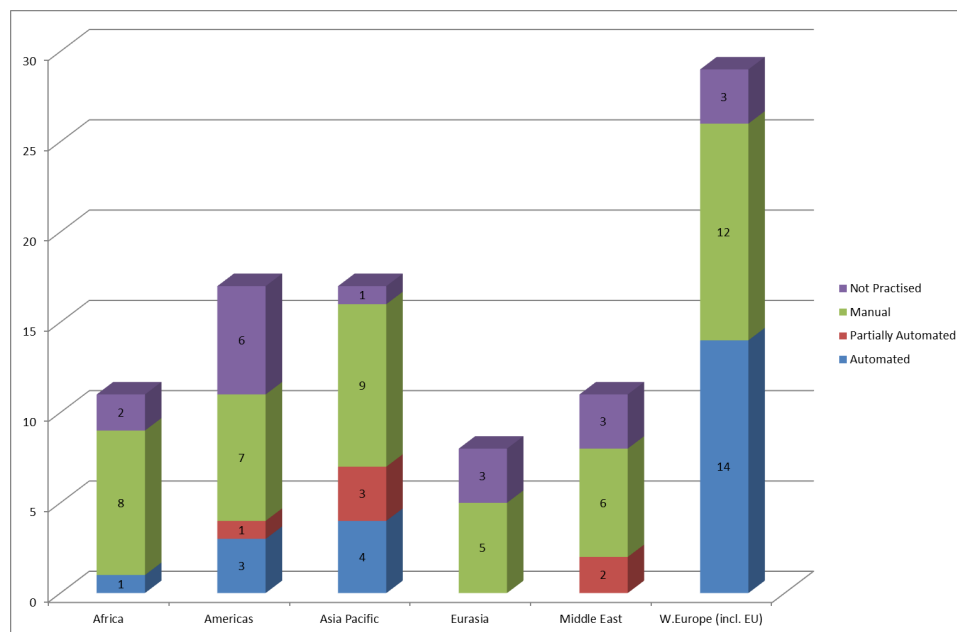
Central matching and pre-matching are both important functions to reduce the liquidity risk exposure posed by failed trades, and the operational risk exposures from manual processes and communication flows. With dual-sided matching models, a ‘tolerance limit’ is often used whereby the cash value of the transaction may differ slightly between the two instructions and still be accepted. Tolerance limits have been introduced in most developed markets. In Europe, the trend is around 15-25 euros (or 10 pounds in the UK), whereas it’s 25 dollars in the USA.

To improve the whole matching process, one of the best tools has been the “Hold and Release” mechanism as it includes both pre-matching and matching in the same process. This allows a counterparty to keep the instruction ‘on hold’ within the matching component of the settlement flow until all conditions for settlement have been met, then ‘release’ it for settlement with certainty that it should not be rejected.

Other processes that have improved matching include the bilateral cancellations of instructions, which requires both parties’ agreement to cancel a trade after matching, and the ability for instructions to remain in the system for several business days (20 is the European Standard) after the intended settlement date without the need for counterparties to re-instruct.

## Example of Matching Arrangements

### Pre-matching



*Figure 3: Pre-matching Arrangements per Region*

The above chart shows that current pre-matching arrangements throughout the world are far from best market practice. Out of the 93 markets surveyed, only 22 have a fully automated pre-matching system, and manual pre-matching is still the norm.

In Europe, around half of the markets have automated pre-matching, which is typically provided by the CSDs. Just 3 markets do not use pre-matching arrangements and directly match their transactions at the CSD (Estonia Iceland and Portugal). There are plans to automate the process in the near future in other markets such as Italy and the Czech Republic.

In the Americas, only 3 markets have an automated process (Canada, Chile and the USA) and the process is partially automated in Mexico (i.e. option to match either via the CSD system or over the phone). In Chile and the USA, the market also uses a third party specialist, Omgeo. The rest of the region uses a manual process or even no pre-matching at all, although this is typically in smaller markets in Central America.

The arrangements in Asia-Pacific are also mainly manual with 9 markets out of 17 with no automated solution. Pre-matching is not practised only in Taiwan or in China for A-shares (but pre-matching is available for B-shares). 4 markets provide automated pre-matching: Hong-Kong, Singapore, Korea and Malaysia (although not available for turnaround trades), and 3 markets offer automated as well as manual arrangements: Australia (i.e. manual for fixed income), Japan and China B-shares.

In the other regions, the process is largely manual apart from South Africa where it's automated and Turkey and Israel where an automated process is available but market participants also use the phone.

## Europe

In Europe, the European CSD Association (ECSDA), in cooperation with the European Securities Forum, published best market practice standards in October 2006 in order to harmonise and standardise the matching process in the region. This was deemed necessary to reduce costs and risks, particularly for cross-border transactions, as each market had different procedures, systems, timings, matching fields etc.

ECSDA introduced 17 standards for equities and fixed income instruments which require bilateral input within the CSD. At this stage, the European CSDs are about 80% compliant with the standards and 5 CSDs are now fully compliant: Estonian CSD, VP in Denmark, SIX SIS in Switzerland, Interbolsa in Portugal and Euroclear UK and Ireland.



## *Conclusion*

As much as securities lending or credit facilities, pre-matching and matching have been and continue to be a key part of the settlement process that needs significant attention to reduce risk and enhance settlement efficiency. In the last few years, many regulators have been focused on achieving high settlement rates, which directly rely on efficient matching and a high STP rate. More automation has been introduced in the markets and the most developed markets have concentrated on trying to match trades as early as possible to ensure smooth settlement and detect errors that may lead to fails as early as possible.

Nevertheless, manual processing is still present in many markets, particularly in the pre-matching area, and there is substantial room for improvement through automation, which would significantly reduce costs and risks. The 'Hold and Release' mechanisms have become a crucial risk mitigant in Europe as it favours early matching and clearly separates the matching process from the availability of cash and securities, but elsewhere there has not been such widespread adoption of this process. As was detailed in January's CMI in Focus, the drive towards shorter settlement cycles is gaining momentum, and the automation of key steps in the pre-settlement/clearing process is essential if this is going to be achieved.



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