

EPTF Report – Annex 3

Detailed analysis of the European Post Trade Landscape

15th May 2017

Disclaimer

This document is a document prepared by the informal expert group “EPTF” set up by the European Commission and it does not prejudge the final policy choices and decisions that the European Commission may take.

The views reflected in this Report are the views of the experts. They do not constitute the views of the Commission or its services, nor any indication as to the approach that the European Commission may take in the future.

Annex 3: Detailed analysis of the European Post Trade Landscape

1. Introduction

Annex 3: Detailed analysis of the European Post Trade Landscape

1. Introduction

This Annex provides a detailed analysis of the European Post Trade Landscape, intended as an overview of all major aspects of the various activities normally included under the broad spectrum of post trade activities and services.

The descriptions in this Annex are provided as reference material in order to facilitate a common understanding of the actors, objectives, roles, responsibilities, services and recent developments in relation to each of the activities herein described.

Significant effort has been made by EPTF members to provide correct and factual information in this Annex. All this information is deemed, to the best of current knowledge, to be correct and valid. However, this is not intended to be an exhaustive and fully comprehensive description of all relevant aspects of post-trade services in Europe.

Given its nature as a reference document about the post trade services industry, the EPTF Report Annex 3 is published as a separate, stand-alone document. The EPTF Report can be found at the following link:

http://ec.europa.eu/info/files/170515-eptf-report_en

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2. Scope and definitions

The Capital Markets Union (CMU) Action Plan¹, provides the focus for the European Post-Trade Forum's (EPTF) work: “..... [in order] to support more efficient and resilient post-trading systems and collateral markets, the Commission will undertake a broader review on progress in removing Giovanni barriers to cross-border clearing and settlement, following the implementation of recent legislation and market infrastructure developments”². As stated in the EPTF “call for applications” and as broadly agreed by private and public entities alike, “efficient and resilient post-trade infrastructures are key elements of well-functioning capital markets and important for facilitating cross-border investment in the EU”³.

The scope of the EPTF work is therefore focused on financial instruments post-trade but it also covers liquidity tools (collateral, ...).

The work covers market infrastructures and systems, processes and services, actors and markets within the broader domain defined by these two key concepts. As clearly mandated in the CMU Action Plan, the work should focus on the review of the known, as well as the potentially upcoming, barriers to cross-border clearing and settlement, including collateral management markets/services. This work should be conducted within the context of recent regulatory, market and technological developments in EU and potentially globally.

Post-trade is primarily about processing of financial instruments after trading. Given the complexity of modern and highly interlinked financial services, defining “post-trade” has in itself been a highly elusive task. Questions arise, depending on commentators’ standpoint, as to which processes, actors and financial instruments should be covered under the term. As a starting point and at high level, it is broadly accepted that *post-trade processes comprise the services that are performed subsequent to the execution of a trade on a financial instrument*.

Post-trade is not however a standalone process. Assuming that post-trade encompasses the services and processes required to complete a transaction, the question arises as to how these processes are connected to and interlinked within the whole transaction chain. There is a broad agreement that due to the increased sophistication of modern financial market arrangements, it is important that any post-trade analysis should seek to identify the broader continuum within which a post-trade process, e.g. clearing or settlement, takes place. As a consequence, issues related to issuance, trading, asset servicing and collateral management could have a material effect on how post-trade functions and barriers are identified, analysed and potentially resolved.

¹ Published on 30.09.2015,

http://ec.europa.eu/finance/capital-markets-union/docs/building-cmu-action-plan_en.pdf

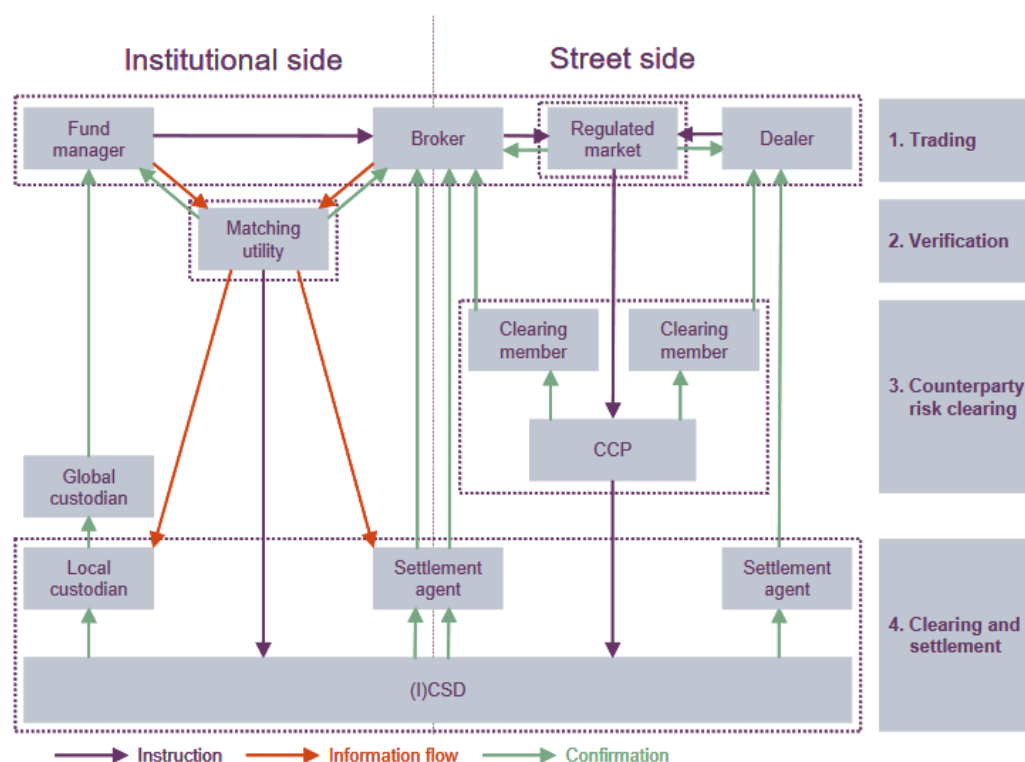
² http://ec.europa.eu/finance/financial-markets/clearing/eptf/index_en.htm

³ http://ec.europa.eu/finance/financial-markets/docs/clearing/eptf/151116-call-for-application_en.pdf

Annex 3: European Post Trade Landscape

2. Scope and definitions

Figure 1: Post-trade Services Ecosystem and Activity Flows



Source: OXERA report 2011 – Monitoring prices, costs and volumes of trading and post-trading services⁴.

All financial instruments processed by post-trade infrastructures should be in scope. A non-exhaustive and high-level categorisation of such instruments would cover *equities* (including units in investment funds), *debt instruments* (e.g. bonds, money market), *entitlements* (e.g. subscription rights, warrants) *certificates* (e.g. index, interest rates and currency)⁵ and derivatives.

Derivative contracts are particularly relevant and important for post trade infrastructures.

First, a derivative that has account-held securities as underlying may result in a security delivery within the standard CSD settlement environment. Second, and by far more importantly, the clearing of derivatives (OTC and on Exchange) whether OTC or via CCPs, may entail challenges for the safety and efficiency of EU market infrastructures. As a result of the role played by uncleared OTC derivatives during the financial crisis that erupted in 2008 and the ability for central counterparties (CCPs) to contain systemic risk and prevent contagion in the cleared space⁶, on 25th September 2009, the G20 Leaders agreed on a set of measures to improve the functioning of the OTC derivatives markets, amongst which by increasing the amounts of clearing of standardised OTC derivative contracts through CCPs⁷.

⁴ <http://www.oxera.com/Oxera/media/Oxera/downloads/reports/Oxera-report-on-trading-and-post-trading-May-2011.pdf?ext=.pdf>

⁵ These categories would cover most of the instruments included in the classification of financial instruments (CFI) code (ISO 10962:2015) and MiFID.

⁶ 'Ensuring efficient, safe and sound derivatives markets', European Commission staff working paper, COM(2009) 332 final

⁷ <http://www.g20.utoronto.ca/2009/2009communique0925.html>

A major distinction is between securities and derivatives. *In rem* rights apply to securities as the investor (shareholder or bondholder) holds them usually (when the securities are safekept by another person than the owner) in custody recorded in securities accounts, whilst derivatives are contracts; the operational differences are also important.

Because of the differences between the post-trading process for securities and derivatives, the following sections of this document analyse how post-trading works in each of these markets, noting the relevant differences within the products including in each of them. This document therefore aims at identifying all relevant characteristics (issuance, market structure, etc.) which may impact the efficiency and safety of clearing, settlement and collateral management. Within these functions, the relevant actors (i.e. service providers and users) as well as are covered. In addition, current trends and future challenges are presented with the ultimate aim of substantiating the remaining and upcoming barriers to truly integrated financial services within the EU.

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2. Scope and definitions

3. Securities markets

3.1. Issuance

3.1.1. Description

Issuance is the first step in the lifecycle of a security, creating also relevance for post-trading. The two fundamental actors are the issuer, who is issuing the security in order to raise money by selling the security, and the investor, who is buying the security.

This section looks at the mechanics of the issuance process; it discusses the trading process (i.e. how the issuer sells the new security to investors) to the extent that the mechanics of the issuance process impact the trading process.

The mechanisms of the issuance process have three primary aspects, namely the legal creation of the security, the set-up of the administrative links between the issuer and the investor, and the settlement of the initial sale of the new security.

The actual issuance and holding procedures, as well as the type of services offered by different entities in the issuance process to issuers, vary considerably from country to country, depending on issuer preference, market practice and regulation.

This section focuses on publicly-traded European securities issued by European issuers; it does not specifically cover the issuance process for privately-traded securities; nor, apart from a mention of depositary receipts, does it cover issuance processes for non-European securities.

3.1.1.1. Creation of security (legal aspects)

The first step in the creation of a security is the corporate decision by the issuer to create the securities. For equity securities, this may mean a decision taken by an extra-ordinary meeting of shareholders to increase the company's capital.

A security⁸ is the incorporeal relation between an issuer and an investor; the relation involves a contract, which assigns rights and obligations to both parties (issuer and investor).

The creation of a security is subject to applicable corporate, commercial or other civil law of a Member State of the European Union, and thus may involve specific legal formalities.

The issuance is a distinct process from the creation. The issuance of securities with respect to securities trading on trading venues refers to the entry of the securities into a Central Securities Depository (CSD), thus making them available for distribution, holding / safekeeping, and onward transfer by intermediaries.

With the entry into force of the CSD Regulation (CSDR)⁹, the issuance of securities to be traded on trading venues can take place in any EU domiciled CSD, regardless of whether that CSD is domiciled in another Member State to the issuer. However, even if a security is issued in another Member State, the corporate or similar law of the Member State under which the securities are constituted shall continue to apply.

As securities are issued in CSDs and credited to securities accounts, contractual relations appear in addition to the contract between the issuer and the investor. These are mainly (i) the custody

⁸ The term "security" is understood in the context of the classification of financial instruments (CFI) code (ISO 10962-2015) and MIFID.

⁹ Regulation (EU) No 909/2014 of the European Parliament and of the Council of 23 July 2014 on improving securities settlement in the European Union and on central securities depositories ('CSDR').

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relationship between the investor and the custodian, (ii) between custodians as securities are often sub-maintained in a custody chain, and (iii) between the investor and its securities as that right in rem is most efficient in protecting the investor against the insolvency of an intermediary.

3.1.2. Types of securities

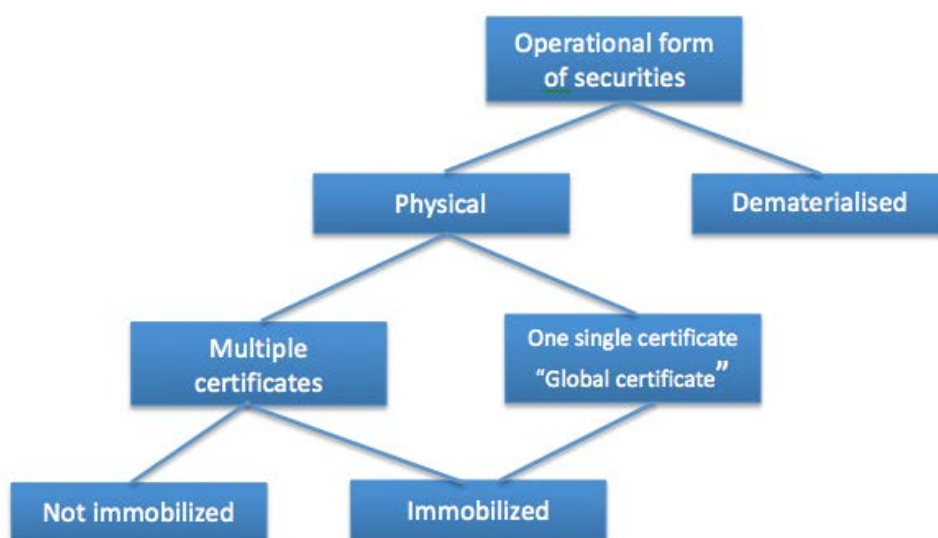
For the purposes of this document securities are financial instruments¹⁰ that can be credited to securities accounts (a securities account is an account in which movements in book-entry securities are booked).

The main types of securities include:

- Equities
- Government bonds
- Corporate bonds
- International bonds; such bonds, which are also frequently termed Eurobonds, are distinct from standard corporate bonds or government debt instruments as they are issued and deposited in the two International Central Securities Depositories
- Money market instruments
- Investment funds
- Depository receipts (DRs)
- Warrants (and other types of derivative financial instruments that have been issued in the legal form of a security)

3.1.2.1. Operational form of securities

Figure 2: Operational form of securities



Source: Paul Bodart.

From an operational perspective, securities can be issued in either physical or dematerialised form. In practice and today, this distinction has hardly any practical impact as most physical (or:

¹⁰ As per the classification of the (CFI) code (ISO 10962:2015) and MiFID.

certificated) securities are held in vaults and then created as entries into securities account, normally at CSD level (so-called “immobilisation”). As a result, throughout the chain of intermediaries, securities are held, materialised and transferred through credits and debits to securities accounts.

Physical securities are securities that have a physical reality, and that are physically safe-kept by the CSD or by an agent of the CSD. There is accordingly the physical possibility that the securities be moved, and be, for example, withdrawn from the safekeeping of the CSD or of its agent.

However, most physical securities do not move during their lifetime, or move only under special circumstances. Many “immobilised” physical securities are issued in the form of a single “global” certificate, rather than in the form of multiple individual certificates, so that there is indeed a physical impossibility to move part of a securities issuance. Transactions in such securities are transferred by debit and credit in securities accounts without the physical securities being moved.

Dematerialised securities are securities that are evidenced in book-entry form on the records of a CSD (i.e. on the issuance and investor accounts of that CSD), and that do not have a physical form. In recent years, several European countries have mandated that some categories of securities no longer be issued in physical form, but rather be issued in dematerialised form. CSDR acknowledges this development, as it prescribes that from 1 January 2023 all new publicly-traded securities, and from 1 January 2025 all publicly-traded securities, be deposited at CSDs in immobilised or dematerialised form, and be represented in book-entry form.

3.1.2.2. Legal form of securities

Independent from their operational form, securities also have a legal form.

The most common legal forms of securities are bearer securities and registered securities.

Historical background

Historically, bearer securities were physical securities for which the mere possession of the physical certificate was the evidence of ownership, while registered securities were securities for which ownership was recorded in a register, so that a change of ownership required changes to entries in the register. In many cases, the form of bearer securities has been used for tradable securities, while the form of registered securities has been used for non-tradable securities, and in particular for shares of small companies.

One key distinction between bearer and registered securities is the degree to which the issuer can know the identity of the investor. After issuance of a bearer security, the security may be sold by the investor, and transferred to a third party, without the knowledge of the issuer. By contrast, and in the event of the sale of a registered security to a third party, the issuer may well learn the identity of the third party through the new entries in the register.

Historically, this distinction has affected both the terms of the relation between the issuer and investor that is materialised in the security, and the specific legal context in which the security is issued. For example, it is possible that for a registered security the issuer has rights to refuse registration of the name of some third parties in the register, while a similar right for an issuer of bearer shares would be impracticable or impossible.

Over time, the distinction between bearer and registered securities has become less sharp, especially for publicly traded securities.

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Settlement of trades in registered securities has always been more complex than settlement of trades in bearer securities. With the broadening of financial markets, and mainly in the United Kingdom there has been a trend for registered shares to be registered in the names of intermediaries (“nominees”), in order to facilitate the settlement process. This has created an obstacle for issuers to know the identities of their investors. As explained above, in all other jurisdictions, the concept of bearer securities achieved the same purpose. These evolutions took place at the end of the 19th century. Throughout the entire 20th century, this has never been an obstacle to increasing volumes and internationalisation of trading.

The process of immobilisation and of dematerialisation of physical securities has also resulted in reducing the distinction between bearer and registered securities, as once securities are deposited in a CSD settlement takes place very largely in book-entry form on securities accounts.

In general, the process of recording securities in a book-entry form by means of dematerialisation or immobilisation (i.e. the replacement of physical certificates by book-entry records at a CSD) has not changed the legal form (bearer or registered) of the securities except for some jurisdiction whereby a specific regime has been created for dematerialised securities (e.g. Italy, UK).

A fundamental characteristic of publicly-traded securities is that they are negotiable instruments, i.e. that the party who initially bought the security from the issuer can resell the security, and transfer it, to a third party without the need of a prior approval by the issuer, and that the third party has the same rights against the issuer as the original buyer.

From a traditional legal perspective, registered securities are not fully transferable, as the issuer needs to be notified of each transfer of shares, or the issuer need to give its approval for the transfer to be effective against the issuer and third parties, as the case may be.

However, as the volumes increased, 2 evolutions took place.

In some jurisdictions, mainly the United Kingdom, nominees held the registered securities in street name. A current beneficial owner of the security could transfer the security by a transfer in the accounts in the books of the nominee. This process is simpler than the change in the issuer’s register.

In other jurisdictions, negotiability was achieved by the introduction of the concept of bearer securities. Bearer securities are anonymous, thus the corporate form of “Anonymous Company” in several legal systems, including Belgium, France, Netherlands and others.

However, today, both bearer and registered securities are held in securities accounts and the differences between bearer and registered types have diminished:

- Because of the credit to securities accounts, the actual beneficial owner of a bearer security is known to its custodian bank, to tax authorities and often to the sub-custodian;
- Because of nominees, the actual beneficial owner is not naturally known to the issuer.

Registered securities

The defining operational characteristic of registered securities is that there is a register, in which the names of the holders of the securities are recorded. The register is maintained by a registrar, which may be the issuer, or an agent of the issuer; a CSD, or a custodian acting as registrar, as the case may be.

As the issuer, or an agent of the issuer, maintains the register, the issuer has access to information contained on the register.

A defining legal characteristic of registered securities is that the issuer has the right to know the identities of its investors.

However, as some jurisdictions never admitted the concept of bearer securities, the name on the register is often the name of an agent of the investor (a “nominee”), and not the name of the underlying end investor. Therefore, issuers are often faced with the operational reality that they are unaware of the identity of many of their investors, and there may be operational difficulties in collecting this information, even though many jurisdictions give the issuer the legal right to know the identities of the investor (called 'beneficial owner' of the securities).

Another important operational consideration is the question of whether the core settlement system of the CSD acts as the register (which may not be the case in some jurisdictions); if this is not the case, and if there is a separate register, then there will need to be an operational process to update the register following the settlement of a securities transaction at a CSD.

Additional information on current registration practices is available in a report entitled “Registration of Securities Holders” that was published by ECSDA on 19 July 2016¹¹.

Bearer securities

Before the creation of CSDs, bearer securities existed only in physical form, and the legal evidence of ownership of a bearer security was physical possession of the security. Accordingly, there was no mechanism, and no right, for the issuer to know – following a sale on a secondary market – the identity of the new holder of the security.

As explained above, traditional “bearer” securities have 2 characteristics: 1. The investor can bear them as they are printed in certificated form, 2. They are not recorded on a register and as a result, they are anonymous to the issuer. In some jurisdictions there is no shareholder identification process for bearer securities; other jurisdictions have allowed for bearer securities’ holders to be identified.

The current situation is best understood not by sticking to traditional legal concepts and forms but by considering the risk and economical aspects: who bears issuer risk? Can the shareholder be identified? Who has the right to instruct the custodian, namely in the case of corporate actions? Who has voting rights in a General Meeting?

Like publicly-traded registered and dematerialised securities, publicly-traded bearer securities are now almost fully deposited in CSDs, so that there are now great similarities in the way investors hold all types of securities, as all securities are now largely held in book-entry form on securities accounts.

One consequence of these developments has been a convergence in operational processes and legal rights for all types of securities.

For example, with relation to the operational processing of dividends and interest payments, the term “record date”, which originally related only to registered securities, is now used for all types of securities, and now relates to the date when the records of the CSD and custodians are consulted, and no longer to the date when the records of the registrar are consulted; with relation to the legal rights of issuer, several jurisdictions have extended rights of issuers to know the identity of the holders of their securities from just registered securities, to other types of securities, including

¹¹ The report is available at:

http://ecsd.eu/wp-content/uploads/2016_07_19_ECSDA_Registration_Report.pdf

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bearer securities. Cross-border efficiency of the shareholder identification process is achieved by allowing issuers to suspend dividend payment and voting rights in relation to unidentified shares.

3.1.3. Roles of different parties

Issuer

The issuer is the entity that initiates the creation of securities and issue securities with the intention of allowing holding and transfer to and among investors in order to raise money. The security typically is either an ownership interest in the issuer (equity or variant) or a liability of the issuer (debt and complex instruments such as convertibles).

Investor

The investor is the person or entity that purchases a security, and has directly (if the investor bought the security in the primary market) or indirectly (if the investor bought the security in the secondary market) provided money to the issuer, and acquired the rights associated with the security.

As the securities that investors have bought are deposited at CSDs, and as in most jurisdictions investors do not hold accounts directly at the CSD, many investors hold their securities through agents (i.e. custodians). In order to distinguish between the investor and intermediaries in the custody chain acting on behalf of the investor, the investor is sometimes termed the end investor or beneficial owner.

Importantly, the investor is the person that bears issuer risk, also referred to as credit risk, i.e. the risk that the share loses market value or that the debt default.

CSD

A CSD performs a series of key critical functions linked to the initial issuance and further distribution of securities on behalf of an issuer. Regulation (EU) No 909/2014 of the European Parliament and of the Council on improving securities settlement in the EU and on central securities depositories” (i.e. the CSDR), provides a granular definition of a CSD based on the services it provides; i.e. a CSD is a legal person that operates a SSS and provides at least one of the following two core services: notary service and/or central maintenance service including settlement and safekeeping services (Article 2 CSDR). Ancillary services of ICSDs include “banking”-type services such as providing cash accounts used by the issuer or lead manager, other members of a syndicate and other CSD participants acting on behalf of the investor. The client of a CSD are frequently termed as “participant”.

Issuance and distribution via CSDs include domestic, foreign and international new issues of global and domestic financial instruments.

Of the key critical functions that a CSD is required to fulfil, the so-called “notary function”¹² involves the initial recording of the existence of a security and equally importantly the confirmation of the total issued amount of a given instrument and the confirmation by an issuer CSD that the total amount of securities held by all participants in the CSD equals the total amount of securities issued (which is usually recorded in an “issuance account” at the CSD). These tasks may be accomplished

¹² Which is completely different from the role a “usual” notary may have to play in the creation and issuance of a security, as it may be necessary for a notary to certify or stamp certain legal documents in order for an issuance to be valid.

in conjunction with the issuer or lead manager, the designated legal counsel for the issuance and any other specialist entity involved with producing founding documents.

As value-added or enhanced services CSDs can also assist lead managers, lawyers and issuing agents by supporting them in issuing more complex securities (such as asset-backed securities, convertibles, securities with rights or derivatives attached). CSDs can also provide additional information on operational procedures and the applicable documentation in the offering memorandum, prospectus and agency agreement. A comprehensive review of issuer services (covered elsewhere in this document) has been produced by ECSDA¹³.

It should be noted that a CSD could become a participant/client to another CSD usually through the opening of one or more securities accounts. The CSD who is the participant/client of another CSD is referred to as an "investor CSD" The other CSD is referred to as an "issuer CSD" as it has received the issuance from the issuer (informally termed as "issuer CSD"). Investor CSD participants can hold, via the CSD link arrangement, securities issued in the issuer CSD. In such a case, the investor CSD acts as an intermediary in the custody chain between its own participants and the issuer CSD.

Registrar

The registrar is an entity that manages the register of a company's shares. It can be the company itself, or a service provider. The role, definition and responsibilities or liabilities of registrar may change from a country to another depending on the local legal framework. Please refer also to the subsection above (3.1.3.) on "registered securities").

Issuer Agent

The Issuer Agent is the intermediary that can act between the issuer and the issuer CSD. The Issuer Agent ("IA") has a contractual relationship with the issuer.

IAs usually provides both issuance services (i.e. the services needed by an issuer at point of issuance) and issuer services (i.e. the services needed by an issuer during the life of a security). There is a strong connection between both sets of services, and the term issuer services may in some cases be used to cover both sets of services.

IAs are in most cases banks, and also typically act as custodian / investor agent for securities issued in that CSD. In particular for issuance services, the IA may need to be a bank, as it may need to process some of the cash flows involved in the issuance process.

The IA manages and processes the issuer accounts in the CSD book (by managing all technical processes and accountancy effect to apply rights according to entitled position in the book of the CSD). It can manage as well the listing of the securities to the stock exchange.

In the event of corporate actions, the IA may be in charge of announcing the corporate actions to the market place via the issuer CSD and the Stock Exchange of the listed securities, and manages the centralization of this operation on behalf of the issuer. See 3.7.1 for more information on issuer services and on issuer agents.

Custodian / Investor agent

Custodian is an entity, usually a bank, that safe-keeps and administers securities or other assets for its customers and that may provide various other services, including clearing and settlement, cash management, foreign exchange transactions, securities lending and collateral management.

Custodians are agents of investors. Their primary function is to hold and safe-keep assets on behalf of investors.

¹³ Available at: http://ecsda.eu/wp-content/uploads/2014/07/2013_10_ECSDA_IS_Report.pdf

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Custodians are extremely widely used as they allow the cross border holding of securities; they also allow an investor to hold in one account securities that have been issued in several CSDs. It must also be stressed that only in a minority of cases, investors access CSDs directly.

Therefore, custodians are part of the very structure of capital markets and holding structures commonly used today.

An investor that invests in publicly-traded securities that are deposited in a CSD needs to have the ability to hold those securities, and thus needs either the ability to hold a securities account directly at a CSD (in a minority of jurisdictions where this is allowed or even legally required), or the ability to hold a securities account at an intermediary, such as a custodian, that in turn holds a securities account at a CSD.

Investors use custodians to access CSDs for two basic reasons. One is that the investor may not have the ability to open a direct account at the CSD due to legal or economic restrictions. Namely, holding securities through custodians allows considerable economies of scale. A second is that many investors invest in many different securities deposited in many different CSDs. From the perspective of costs and of operational risk, it may be advantageous to an investor to maintain a single relationship with a single custodian, rather than to maintain multiple relationships with diverse CSDs located in many different countries this structure is often referred to as “global custody”).

As in many cases, there is more than one intermediary or custodian in the custody chain (for example a global custodian and a sub-custodian) between the end investor and the issuer CSD, the term “last intermediary” is used to refer to the custodian that provides a securities account to the end investor.

It should also be noted that most often, a “custody chain” of intermediaries between the issuer and the end investor are composed of 4 intermediaries, which are:

Figure 3: Description of the custody chain



Source: EBF.

Transfer Agent

A transfer agent is an entity that acts as a registrar for shares or units in an investment fund.

Trustee

Trustees exist in English law only. They are usually required to administer a debt issue sold to the public for which their appointment is customary. The appointed trustee is usually vested with the legal right and authority to act for the benefit of all debt security holders, in particular, but not limited to, when the issuer defaults. Given substantial duties to perform by the indenture of the debt security, the trustee not only protects the interests of the security holders, but it also performs essential services for the issuer, such as managing the collateral backing a debt securities, collecting the proceeds of underlying loans for asset backed securities, and supporting collateral debt obligation vehicles.

Paying Agent

The PA is an intermediary between the issuer and the issuer CSD and financial intermediaries. The Paying Agent (“PA”) has a contractual relationship with the issuer.

It can process payments via the CSD (called in some countries “direct payment”) that pays down to its participants which pays down to their clients (etc.), or via bank transfer to designated banks (called in some countries “classical payment”).

In the event of a corporate event, the PA may be in charge of announcing it to the market place and managing the centralization of the operation on behalf of the issuer.

In many cases, the PA is also the Issuer Agent, and thus may be termed an Issuer and Paying Agent (“IPA”).

Withholding Agent

As during the life of a security there will typically be income to be distributed to the investors, the issuer may need to appoint a withholding agent; such an agent is responsible for withholding the appropriate tax from income payment proceeds and ensuring that it is paid and reported appropriately to the tax authority in the issuer’s domicile. This is a service often provided by custodians.

National Numbering Agency

A national numbering agency (NNA) plays an ever more responsible role in the issuance process by fulfilling a number of key tasks including:

- Collect registration data including issuer information, type of instrument, its terms, and countries where it will be traded
- Assign an International Securities Identification Number (ISIN) and a Classification of Financial Instruments (CFI) code to the new instrument
- Gather additional financial identifiers from other sources to enrich the identification of the instrument
- Contribute identifiers, data and updates to the global database maintained by the Association of National Numbering Agencies (ANNA) Service Bureau
- Validate registration data and maintain its accuracy over time
- Provide ISINs and CFIs to users on request
- Serve as Substitute Numbering Agencies, assigning ISINs and CFIs for nations that do not yet have National Numbering Agencies

With the further development of common international standards such as the Legal Entity Identifier (LEI) and the Unique Product Identifier (UPI), these standards will be increasingly used by NNAs.

The National Numbering Agencies can be regarded as designated institutions and are divisions of larger entities, such as central banks, central securities depositories, data vendors, regulators and stock exchanges. Each of these agencies has been appointed by their national financial regulators to take on this role.

CSD agents / Common depository

In some specific situations and for certain instrument types, a CSD may require an agent to safe-keep securities that are deposited in the CSD. In some cases this may be for outsourcing of certain services such as the operation and maintenance of vaults for immobilised physical securities or global notes for example.

The two European ICSDs (Euroclear and Clearstream) provide a framework for the issuance of so called international securities including “Eurobonds”. International securities that are primarily

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deposited and settled with Clearstream Banking S.A. and Euroclear Bank are generally issued in the form of a Global Note. Such Global Notes can be exchanged later for definitive Certificates, or can remain as a permanent representation of the securities until final maturity. Common depositories are appointed jointly by Clearstream Banking S.A. and Euroclear Bank to act as their representative for the closing of the issuance process and to provide safe custody and servicing for international securities issued in Classical Global Note (CGN) form.

Issuers of international debt securities to be deposited and settled with Clearstream Banking S.A. and Euroclear Bank can also opt for a New Global Note (NGN). Under an NGN, the Issue Outstanding Amount (IOA), which is the record of the total amount of securities that have been issued, is determined by the records of Clearstream Banking S.A. and Euroclear Bank rather than by physical annotation on the Global Note itself. Common Safekeepers, for such NGNs, are appointed jointly by Clearstream Banking S.A. and Euroclear Bank.

Lead Manager

A lead manager is a financial institution that acts on behalf of an issuer of securities, and that manages in the primary market the sale and distribution of the new securities.

As for an important issuance there may be several financial institutions that are involved in sale and distribution of the new securities, with one institution, the “lead manager”, taking on a role of coordination.

Underwriter

An underwriter takes on risk related to a securities issuance from an issuer; the underwriter typically guarantees that a given amount of securities will be sold at, or above, a specific price.

Typically, the lead manager of an issuance also takes on the role of underwriter. If the lead manager fails to sell the entirety of the guaranteed amount of securities, then the underwriter will purchase the remaining securities from the issuer.

3.1.4. Security issuance processes

3.1.4.1. Set-up of issuer to investor link

The issuance of a security involves a set of administrative processes that have the objectives of (i) allowing the investor to hold the security in a safe and secure manner, and (ii) creating a communication mechanism between issuer and investor (so as to facilitate the processing of corporate events during the lifecycle of the security).

Central securities depositories play a critical role in the set-up of the issuer to investor link as CSD receive issuances from issuers and hold their participants’ custody accounts.

It is standard practice that a publicly traded security be issued and thereby deposited in its entirety at a CSD, so that the CSD safe-keeps all units of a particular security on behalf of investors. As a result, the CSD acts, in most cases, as the point of contact between the issuer, and the investor, or an agent acting on behalf of the issuer, or an agent acting on behalf of the investor.

3.1.4.2. Settlement of primary market transactions

CSDs operate securities settlement systems (SSSs), as defined by the Settlement Finality Directive¹⁴, and their overall conduct and operations are further structured under obligations imposed by the CSD Regulation. In a cross-border scenario, the SSS of the CSD in which a security is issued together with the SSS of an investor CSD that has an account with the issuer CSD, allows for the settlement of the primary market transactions whereby the issuer receives the cash proceeds from the sale of the new securities, and the investor receives the securities. The settlement of transactions between participants of issuer and investor CSDs will be facilitated in a near future¹⁵, as many European CSDs¹⁶ will have outsourced their “settlement” function to the Eurosystem’s TARGET2-Securities platform.

3.1.4.3. Generic Securities Issuance Processes

a) Provision of legal and other documentation to CSD

All securities are formally issued under a specific, applicable law, which is the law applicable to the relation issuer – investor such as the law of the country where the issuer is domiciled (*lex societatis*) in the case of share issuance and the chosen law (*lex contractus*) in the case of debt issuance.

For a security to be publicly tradeable, there is a requirement pursuant to Article 3(1) CSDR for the security to be issued, or made eligible, in a book-entry form within a CSD.

In many cases, for a security to be issued, or made eligible within a CSD, there is a requirement for legal and other documents (such as, for example, a prospectus) to be supplied to the CSD.

b) Set-up of details of a (new) security in securities database of the CSD

The operational process whereby a security is made eligible within a CSD will include the setting-up of the new security in the securities database of the CSD. Among the information stored in the securities database will be the ISIN (International Securities Identification Number), which is an internationally recognised code that uniquely identifies a particular security. ISINs are issued in accordance with the international standard ISO 6166, which determines that for equity securities the first two characters of the ISIN identify the country where the issuer of securities is legally registered or in which it has legal domicile.

c) Creation or update of an issuance account

The operational process of setting-up a new security in a CSD will include the creation either of an issuance account for that security, or of an equivalent technical mechanism for ensuring that for a specific ISIN there is a control on the total number of securities held within that CSD.

An issuance account at a CSD is a technical securities account that records for a given security (i.e. a given ISIN) the total number of securities issued within that CSD. Issuance accounts at a CSD are distinct from investor or participant accounts, which record the amounts of securities held by different investors and confer ownership.

It should be stressed that the law applicable to the credit of the securities to the securities accounts is typically the law of the country where the securities account is maintained.

¹⁴ Directive 98/26/EC of the European Parliament and of the Council of 19 May 1998 on settlement finality in payment and securities settlement systems.

¹⁵ <https://www.ecb.europa.eu/paym/t2s/progplan/html/index.en.html>

¹⁶ Particularly all Euro-zone CSDs

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It is a mandatory requirement¹⁷ that at any moment in time and for any individual security within a CSD the total amount of issued securities equal the total amount of securities held on investor accounts. This is referred to as the “integrity of the issuance”. Protecting the integrity of securities issuances in this way, i.e. making sure that the number of securities issued is, at all times, equal to the total number of securities in circulation (i.e. booked in investors’ accounts) is a critical function performed by CSDs towards the issuer and it is a function that is performed by each custodian in the custody chain by mean of reconciliation of accounts. Failing that reconciliation and lacking integrity, loss or inflation of securities could occur, i.e. the situation where a given investor has less securities than he thinks he has, or the case where the total sum of all securities held in the investors’ accounts is greater than the number of securities originally issued by the issuer of that particular security.

One technical method of meeting this requirement is for a CSD to use a system of double-entry bookkeeping, whereby issuance accounts record negative amounts, while investor accounts record positive amounts. Under such a system, the total balances (on issuance account and on all investor accounts) for any individual ISIN within a CSD should always be equal to zero.

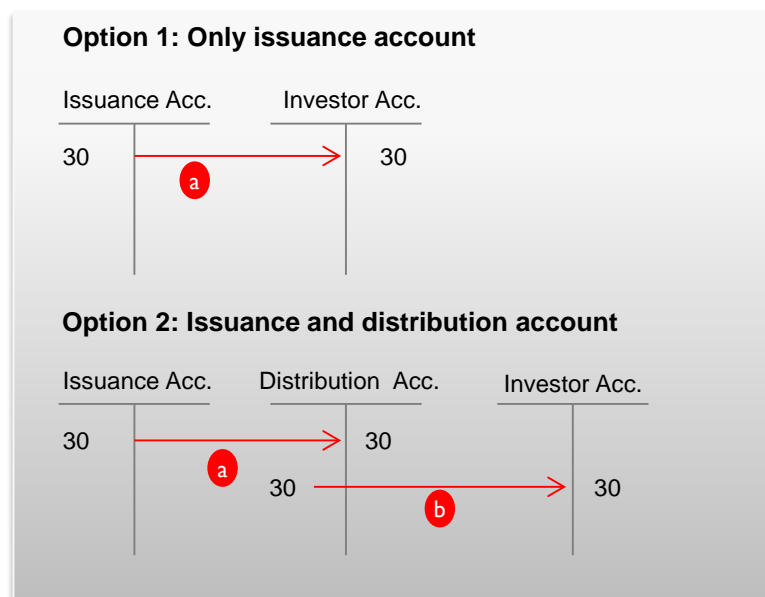
d) Generic distribution process of a security at a CSD

There are two generic options for the distribution process.

One option is whereby the settlement of the primary market transactions takes place directly on the issuance account.

A second option is whereby securities are first of all transferred (typically free of payment) from the issuance account to a “distribution” account, and then the (against payment) settlement of the primary market transaction takes place between the distribution account and the account of the investor. From a functional perspective, a “distribution” account is the same as an investor account, but is typically used only for the distribution of new issues of securities.

Figure 4: Overview of Generic distribution Process



Source: Report of the Task Force on Adaptation to Cross-CSD Settlement in T2S (TFAX), ECB, November 2012.

¹⁷ See Article 37 of Regulation (EU) No 909/2014.

Distribution accounts are used for a variety of reasons. One possible reason for using a distribution account is if the issuance account (opened in the name of the issuer) is not linked to any cash account on the settlement platform of the CSD, so that against payment settlement is not possible; another reason is if the issuer has used a lead manager, or other agent, to manage the distribution process, so that the distribution account will be an account opened in the name of the lead manager or underwriter.

e) Features of generic issuance process

Ideally, an issuance process will be characterised by a high degree of automation, a high degree of settlement efficiency, and a low amount of risk.

Risk in the issuance process can be viewed from two perspectives. From a pure post-trade and administrative perspective, there is risk in manual, un-automated procedures, and in processes that involve transfers of money and securities that do not take place in a “delivery-versus-payment” (DVP) context.

From a trading perspective, there is additional risk in the issuance process if the mechanics of the issuance process mean that there are delays in the setting of a secondary market for the new issue, which would not allow primary market participants to lay off quickly the risks that they have taken in the primary market. This trading perspective is particularly relevant for underwriters and for investors in the primary market, but there is also a knock-on impact on issuers (as issuers pay underwriting fees). However this issue would be mitigated by the entry into force of CSD -R article 3 (2) whereby securities traded on the market shall be recorded in a CSD no later than the intended settlement date.

3.1.4.4. Specific issuance processes

Certain categories of securities may have particular issuance practices that create particular problems or risks. Particular problems can occur if, for example, there are important issuance processes that take place outside the CSD, and in a non-DVP environment.

a) Equities

Equity issuance practices are diverse, and are heavily dependent on the national law of the issuer as the *lex societatis* applies.

Some of the practices that may cause risk in the issuance process include:

- Domestic corporate law may require that primary shares are pre-funded before shares can be issued. The entities that will participate in the primary issuance will need to evidence that they have enough funds to pay for their part in the primary issuance, before the actual process takes place.
- Domestic requirements to create shares and their interpretation varies (timing, amount of prefunding, local intermediation);
- An independent third party (such as the local Commercial Register) is sometimes required to confirm shares have been pre-funded;
- Central Securities Depositories may require physical share certificates to be deposited a day or more prior to commencement of trading.

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Many of these practices have their origin in an environment, in which all securities were issued in paper form, and CSDs had limited settlement capabilities; they are often driven by a concern to minimise risk at one particular point in the process, namely the actual legal creation of a security.

To efficiently manage risk, investors require the ability to trade shares immediately after allocation. Ideally, and as in the description of the generic settlement process, settlement of primary market transactions would take place delivery versus payment (DVP). However, to create shares in many European jurisdictions, pre-funding is required to varying degrees, so that investors and underwriters can face credit and market exposure.

These technical requirements and practices could decrease an underwriter's willingness or ability to underwrite a primary share issuance for an issuer especially in a stressed environment.

These technical requirements and practices vary from jurisdiction to jurisdiction causing an uncertain landscape, for example:

- The amount of credit and market exposure can vary from nominal to full market value of the new shares;
- The amount of the exposure born by a market participant also varies from issuer to underwriter to investor; and
- The amount of time a market participant must bear this exposure varies from intra-day to a few days.

b) Government bonds

Government bonds are typically issued in the national CSD, and primary market settlement takes place on the accounts of banks that are appointed by the national debt management agency as primary dealers. Primary dealers are used to facilitate the distribution process, and typically are under an obligation to act as a market maker in the secondary market.

c) Corporate bonds

An important specificity with respect to corporate bond issuance is the role of the trustee. One current trend that is driven by regulation is for increased responsibilities with respect to reporting and calculation obligations that are placed on agents and trustees.

Another specificity relates to restrictions, imposed directly or indirectly by regulation, as to which categories of investor are entitled to purchase a corporate bond. A common restriction, which derives indirectly from an exemption under the Prospectus Directive, is for issuers to require that all investors in a bond purchase a minimum of EUR 100 000 in that bond. In some CSDs, this restriction is enforced by the usage of a technical tool that limits bond settlement amounts to a minimum of EUR 100 000 (i.e. at point of issuance, and in its securities database, the CSD sets a Minimum Settlement Unit of EUR 100 000). While in some jurisdictions this is a possibility to simplify the process, in many others this is an example of a restriction on trading that is enforced at the settlement level, and that has the potential to cause problems for the diversity of the settlement activity that takes place in a CSD.

d) International bond (often termed Eurobonds¹⁸)

¹⁸ The word Eurobonds refers to bonds usually denominated in a currency different to the country of the borrower/issuer, issued in bearer form (which meant that it could be held anonymously), placed outside the

International/Eurobond issuances are specific for several reasons, including the existence of two separate, interoperable ICSDs (Clearstream Banking S.A. and Euroclear Bank), and the role of common depositories or common safekeepers who may perform a series of agency functions. Eurobonds are often issued as part of a “programme of issuance” initiated by the issuer which may be (but not necessarily restricted to) a corporate, financial institutions, government entity or supranational organisation. Eurobonds may be issued in any one of the around forty-five currencies in which the ICSDs offer against payment settlement.

Any issuer that wants its (international) debt to qualify as eligible Collateral for Eurosystem monetary policy and intraday credit operations has been required, as of 1 January 2007 to issue the debt using the new New Global Note (NGN) form¹⁹. This structure is available in conjunction with the Classical Global Note (CGN) form for other securities. The differences between the two forms are as follows:

Table A: Overview – Classical global notes/ new global notes

	CGN	NGN
Security type	International Securities	International Debt Securities
Legal form	Global Bearer or Registered Global Bearer	Global Bearer
Safekeeping location	Common Depository	Common Safekeeper (Bank or ICSDs)
Asset Servicing entity	Common Depository	Common Service Provider
Legal record keeper	ICSDs	ICSDs
Date of introduction	1986	June 30 th 2006
ECB eligibility	Yes, if issued before 30 th June 2006	Yes, if deposited with ICSD common Safekeeper

Source: EPTF member.

There are two main methodologies employed for the settlement of new Eurobond issuances, namely syndicated and non-syndicated issuance.

➤ **Syndicated Issuance**

Syndicated issues are bond issues which are underwritten by a syndicate of investment banks and whereby the issuance is facilitated by a single lead manager (“LM”) through its new issue syndication account with either Clearstream Banking Luxembourg or Euroclear Bank (the “ICSDs”).

borrower/issuer country, syndicated by an international consortium of banks, and listed on a European exchange. This should not be confused with the notion referring to Eurobonds as suggested government bonds issued in Euros jointly by the 19 Eurozone countries.

¹⁹ See ECB press release dated 13 June 2006 which can be accessed at:

<https://www.ecb.europa.eu/press/pr/date/2006/html/pr060613.en.html>

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This account is specifically developed for such closings and allows the ICSDs to monitor activity in terms of the release of cash from this account to the issuer on the basis of cash coming in from secondary trades either from the LM or the other banks in the syndicate.

The common depository (“CD”) or common service provider (“CSP”) (in certain cases where the new issue would qualify as ECB eligible collateral), appointed by the ICSDs (see above), plays a critical role in administering the closing process in terms of the payment of the new issue subscription funds to the issuer and the simultaneous release of the bonds to the LM.

In approximately 95% of all new issuance events the Common Depository is also the Paying Agent, which provides for a more seamless closing process as well as for the on going servicing of the issue. Where the function is split, and a separate Paying Agent is appointed, there is an additional series of cash payments that need to be released between the members of the syndicate and the issuer.

The various stages in the process can be described as follows:

To start the process, the LM or its counsel will provide the draft terms and conditions (normally an initial draft of the Offering circular) to both ICSDs in order to determine that their basis eligibility criteria have been met and so that an ISIN can be allocated by one of the ICSDs. This is important in identifying the security and can be used in any “grey market” trading.

The Lead Manager is required to send an allotment list prior to closing so that the ICSDs can set up the monitoring process as outlined above and normally the LM’s counsel will draft the Closing Memorandum which will detail all the steps required for closing including all the required payment and settlement instruction as well as all the Condition Precedent (“CP”) requirements to be provided by the issuer and the LM (s).

The CPs would normally encompass all the legal opinions, accounting statements etc. as well as execution of all the documentation including the agreement amongst the managers as well as the documents constituting the issue itself such as a Trust Deed or Fiscal Agency agreement and any ancillary documentation depending on the deal structure (plain vanilla or structured).

The new issue would normally be listed on a recognised stock exchange and evidence of listing would represent an important CP. ICSD would issue the securities identifier or ISIN in its role as numbering agent for the International market.

In terms of the closing value date - normally held on the actual day if a same day currency such as euro, US dollar or pound sterling, or on the prior business day for overnight currencies (such as Japanese yen, Chinese renminbi, HK/Singapore/Australian dollar) - the following need to occur.

- The common depository, or common safekeeper for a security that is eligible as Eurosystem collateral, to be in receipt of the executed and authenticated global note immediately upon the confirmation received from the controlling lawyer that all CPs have been received and the closing can be completed.
- The CD or the CSP has received complete and authenticated payment instructions in order to be able to initiate the payment to the issuer.
- The CD or the CSP has received an Irrevocable Commitment to Pay from the appropriate ICSD.
- The CD or the CSP will then provide the “green light” to the appropriate ICSD by release of a SWIFT message to release the bonds, which action will trigger the payment by the ICSD in terms of the commitment to pay and the common depository will simultaneously release the payment to the Issuer.

The closing is then complete.

➤ Non-Syndicated Issuance

The process for non-syndicated issuance is simpler.

In this case the Issuing & Paying Agent, appointed by the Issuer under the terms of an Issuing & Paying Agency Agreement, will settle each trade with an appointed dealer directly through its dedicated New issue Account and the trading account of the dealer with the appropriate ICSD.

The trades could either be Medium Term Notes or Commercial Paper / Certificates of Deposit on this basis.

Each trade is initiated by the provision of an initial term sheet to be followed by a Final Terms or Pricing Supplement which sets out the full terms and conditions of each issue in conjunction with basic terms and conditions which are set out in a Base prospectus or Information memorandum. ICSD would issue the securities identifier or ISIN in its role as numbering agent for the International market.

The ISIN allocation will either be effected through the European Pre-Issuance Messaging system (EPIM), which is an automated system loaded by the dealer, by a code pre-allocation basis, or through a manual direct application from one of the ICSDs.

Again in the vast majority of cases the IPA will also be the CD or the CSP.

In the majority of cases the Issuing & Paying Agent will be holding a Template Master Global Note to enable a new note to be replicated from the Master to represent each new issuance and the Final Terms/Pricing Supplement (normally only for MTNs) is then attached to the global note.

In terms of the actual closing mechanics, the new note will be created and credited to the IPA's securities account, and instructions will be generated for the transfer to the account of the dealer against payment by the dealer, and the trade will normally be pre-matched.

Trades normally settle in the overnight batch so that in relation to same day currencies, the IPA can see his account has been credited and then pay the Issuer under normally standing instructions.

For overnight currencies the IPA will have to ensure that from a credit perspective he can issue instructions to pay the issuer prior to seeing the funds in his account.

It should be noted that many MTN new issuances are effected on a free of payment basis (particularly where the Issuer and Dealer are of the same "family", which may be the case for the major investment banks). In these cases the IPA merely "dumps" the paper into the dealer's trading account and any payment is effected separately.

A number of syndicated trades can also be handled on a free of payment basis ('FOP').

➤ European Pre-Issuance Messaging system (EPIM)

Clearstream Banking, Euroclear Bank and Depository Trust and Clearing Corporation (DTCC) have launched a joint initiative product designed to increase the speed and efficiency of ISIN and common code allocation for selected money market instruments. Launched in 2002, the EPIM platform is an automated, secure system that uses standard messaging formats and a standard messaging protocol to disseminate issuance information between the relevant Primary Market participants.

e) Asset backed securities (ABS) and Structured financing

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Asset backed securities are debt securities supported/backed by almost any kind of assets (mortgage loans, car loans, student loans, credit card payments) which have a predictable payment stream coming from the assets. The capital redemption of the debt securities is linked to the planned income stream. The assets are owned by the issuer of the debt securities and, usually, placed with a trustee.

For example, a mortgage-backed security (MBS) is a bond backed by an undivided interest in a pool of mortgage loans. Payments from the underlying mortgages are used first to pay interest and then to make principal payments on the bond. As a result the face value of the mortgage bond is reduced overtime.

Structured financing securities are debt securities supported/backed by a portfolio of assets (debt securities, loans). The capital redemption of the structured finance securities is linked to the payment stream of the assets. The assets are owned by the issuer of the debt securities and, usually, placed with a trustee. The organisation of the whole structure may be layered in different tranche with different risk profile and related return.

The primary issuance process of an asset backed securities or a structured finance securities does not differ from the issuance of a more standard debt securities. What is critical is the proper initial set-up of all the parties that will play a role in the servicing of the security during its tenure.

f) Investment funds

Investment fund issuances are specific, both because for many funds it is possible for shares or units in the fund to be issued or redeemed at any point in the life of the fund, and because subscriptions or redemptions in a fund may not settle at a CSD.

There are currently two ways to process subscription/redemption for funds one called “Transfer Agent Model” and the other “CSD model”. (Please see the separate “Investment Fund” section for more information.

g) Depositary Receipts (DR)

Depositary receipts are securities that are issued in one country, and that represent a holding in securities issued in another country. The purpose of their issue is to facilitate investment in the underlying securities by investors located in the country of the issuance of the DR. Typically, DRs are traded in the currency of the country of issuance of the DR, and the trading and post-trade process uses the standard market infrastructure and post-trade process, of that country.

Depositary receipt issuance is specific, both because depositary receipts can be created or cancelled at any point in the life of a depositary receipt programme, and because of the specific role of the issuer of depositary receipts. The DR is created when an investor contacts a broker to make an investment in a company with a DR program in that market. The broker can either purchase DRs in the secondary market or create DRs by purchasing the company’s shares in the local stock market and then delivering them to the depositary’s local custody bank.

The custodian bank instructs the depositary bank to issue the DRs and deliver them to the initiating broker, who then delivers the DRs to the investor.

Following receipt of the shares by a locally appointed custodian, the depositary bank causes the equivalent issuance of DRs (via agents) into the central securities depositary or to a directly registered DR Holder if so instructed.

For sponsored DR programs (i.e. where the depository bank has a contractual relationship with the issuer), the issuance of DRs is governed under a standard form deposit agreement (under usually New York or English law).

Issuance of DRs for Pre-release

In the case of pre-release, the depository bank issues DRs to a broker entity in advance of the receipt of shares but following the receipt of cash collateral (typically in USD) and satisfactory undertakings from such broker entity.

The issuance process for pre-release is typically governed under a standard form pre-release agreement.

h) Money market instruments

Money market instruments have as characteristics that they are highly standardised instruments, and that the primary market transaction is between an issuer and only one investor, or only a very small number of investors. This allows for a rapid, and highly efficient, issuance process. In some CSDs, it is possible for money market instrument to be issued and settled on a same-day basis.

3.1.5. Competition

From a competition perspective, it is helpful to divide issuance services into three basic categories.

3.1.5.1. Provision of the CSD notary service

An issuer of a security needs to choose a CSD that will provide the notary service for that security (i.e. that will act as issuer CSD for that security). Issuers and issuer agents may take into account several different considerations in the choice of a CSD. The decision will be driven by three basic considerations, namely legal and fiscal requirements, service level of an individual CSD, and the ability to access investors (including the ability to be traded on a particular trading venue).

In general, these considerations strongly determine the choice of the CSD. In almost all cases, equity issuance takes place in the domestic equity CSD of the country of the issuer.

Most European corporate bond issuance (including issuance of international bonds) takes place in the ICSDs. If the ICSDs are used, then the structure of a common depository/common safekeeper means that ICSDs jointly function as if there were a single issuer CSD with respect to the provision of the notary function. However, there is also corporate bond issuance in some of the national domestic CSDs. In some cases, a national domestic CSD may in effect function as a common depository; this would occur when the domestic CSD provides the notary function, while most settlement volume takes place in the ICSDs.

In general, most government bond issuance takes place in national domestic CSDs. However, some public authorities also issue in the ICSDs.

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3.1.5.2. Provision of CSD ancillary services related to issuance

Beyond the core services listed in CSD Regulation (CSDR), a CSD may also provide non-banking-type ancillary services (i.e. securities lending, collateral management etc.)²⁰ And banking-type ancillary services (listed in Section C of the Annex of CSDR).

Some of these services (e.g. shareholders' registration, corporate actions, general meetings and fiscal agent) may also be provided by a CSD participant acting as an issuer agent. As a result, there may be a degree of competition between CSDs and issuer agents for the provision of some of these services.

The degree in overlap of service provision will in general be greater for non-banking-type ancillary services than for banking-type-ancillary services, as CSDs are subject to tight regulation with respect to the provision of banking services. In particular, many CSDs may in practice be unable to provide many of the specific issuance services that require the issuer agent to process cash flows.

3.1.5.3. Provision of other issuer services

The market for the provision of issuer agent services is largely segmented by CSD in which the securities are issued. One reason is that issuer agent services are commonly provided as part of package with other corporate financing services. Another reason is that issuance processes in any individual CSD are still heavily influenced by national legal and fiscal requirements, and by specific processing requirements of that CSD. See section 3.7.2 for more details.

3.1.6. Future Trends

3.1.6.1. Impact of TARGET2-Securities (T2S)

As CSDs are migrating on to the common T2S platform in several waves from June 2015 to September 2017, it is expected that the impacts of T2S on issuance practices will only take gradual effect. For more information on T2S, please refer to section 3.5 on "Settlement".

T2S holds the prospect that an issuer that issues in any CSD on T2S will more easily be able to attract investors. There are several reasons why this may be the case. One technical reason is that the T2S platform facilitates CSD to CSD settlement links, and thus creates the possibility that investors that can settle transactions in one CSD on T2S can use this CSD to settle transactions in securities deposited in other CSDs on T2S. A more general reason is that the T2S project fosters a high degree of harmonisation in market practices across all CSDs on T2S primarily with relation to settlement but also potentially to asset servicing; this has the general effect of facilitating access for all types of investors to all CSDs on T2S.

One consequence is that issuance in a CSD on T2S, rather than in a CSD that is not on T2S, may become more attractive, so that there may be a trend for issuers to shift some issuances from CSDs outside of T2S, or from private placement regimes, to CSDs on T2S.

If such a trend occurs, it is more likely to concern corporate bonds, including international bonds/Eurobonds, than equities or government bonds for the reasons set out in section 3.1.3.1 above.

More information on the T2S platform and on its impact is available in section 3.5.2.4 below.

²⁰ listed in Section B of the Annex of CSDR.

3.1.6.2. Impact of CSD Regulation

CSD Regulation (CSDR) places a set of wide-ranging requirements on CSDs, and is expected to have a significant impact on CSDs, on their internal operation, and on the market for the provision of CSD services.

One notable aspect of CSDR is that in Article 48 it gives issuers the explicit right to use a CSD located in another country. This will tend to increase the frequency of cross-border issuance of securities, if issuers demand therefore exists.

CSDR will also require CSDs to implement more stringent controls on acceptance of issuers and the planned issuance, and it will place more severe restrictions on CSDs with respect to the provision of banking-type ancillary services.

3.1.6.3. Impact of New Technologies

Currently, considerable attention is being paid to the possibility of new technologies, and in particularly Distributed Ledger Technology (DLT), radically changing the issuance process.

There is, as of now, little certainty as to the real prospects of DLT in the issuance process. However, if DLT does have a significant impact, then it is expected the impact will initially be concentrated more on the issuance of non-publicly traded securities, as CSDR does not allow for securities traded on trading venues to be issued anywhere else than in a CSD. However in the longer run, CSD may consider in the future using DLT as a tool to facilitate to enhance their issuance services

Another important consideration, amongst other considerations, is how, in a potential unrestricted DLT environment, the notary function within the issuance process would be maintained.

3.2. Trading

3.2.1. Description

Trading or trade execution, is the pre-condition of post-trading and therefore defines the flow into the post-trade ecosystem. There are a wide variety of trading and execution practices using different market models and execution types. The focus of this document is on post-trade, and therefore rather than describe the intricacies of trade execution, it is more applicable to consider “trading” as a source of flow, which is the origin of contract formation between a buyer and a seller.

In this context it is possible to distinguish:

a) on-exchange (on book or off book) trading:

This would be executed under the rules of a regulated market, Multilateral Trading Facility (“MTF”)²¹, Systematic Internaliser (“SI”)²² or upcoming Organised Trading facility (“OTF”)²³, as

²¹ Multilateral Trading facility is defined in MiFID II as a multilateral system, operated by an investment firm or a market operator, which brings together multiple third-party buying and selling interests in financial instruments – in the system and in accordance with non-discretionary rules.

²² Systematic Internaliser is defined in MiFID II as an investment firm which, on an organised, frequent systematic and substantial basis, deals on own account when executing client orders outside a regulated market, an MTF or an OTF without operating a multilateral system.

²³ Organised trading facility is defined in MiFID II as a multilateral system which is not a regulated market or an MTF and in which multiple third-party buying and selling interests in bonds, structured finance products, emission allowances or derivatives are able to interact in the system in a way that results in a contract.

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defined in Art. 4 of MiFID II²⁴. It is important to note that trades executed on exchange are either “on-book”, i.e. matched on the electronic order handling mechanism of the exchange or struck “off-book”, bilaterally or through negotiation and then reported (generally by the sell-side) to the exchange resulting in an exchange reported trade. It is generally considered that these venues, regardless of market model (such as auction, bilateral negotiation or Central Order Book) will be an electronic process resulting, upon trade execution, in an instruction for post-trade processing. The instruction depends greatly on the instrument type and asset class as well as other post-trade price and/ or size reporting characteristics.

b) off exchange or Over The Counter (“OTC”) trading:

This, executed away from the exchange/ trading venue, could be either bilateral, negotiated, ad hoc by nature, or systematic (regulated by MiFID II/MiFIR where the definition of 'systematic internaliser' is fulfilled and hence the model of an unregulated Broker Crossing Network (“BCN” would have to be abandoned) or intermediated by a broker (either voice or electronic). In case of the former, they could either be on an electronic price matching platform or voice.

In both cases (on exchange and off exchange) the underlying instruments should be classified according to MiFID categories of financial instruments²⁵, such as transferable securities, money market instruments, Units in Collective Undertakings, derivatives – whether financial or commodity derivatives and which may be physically settled or cash settled.

Trading involves order management functionality for timely and efficient execution; **Trade Management** activity allows for straight-through processing and timely allocations.

Figure 5: Standard Securities transaction process



Source: Bloomberg²⁶.

This process is largely consistent whether the trade is carried out on exchange or off exchange, although much of the off exchange flow is less automated.

The trading infrastructure directly influences the post trading processes (which in turn influence the “next trade”). All trading venues have clear rules in place to ensure that the timely finalisation of the transactions executed under their systems (Art. 47 MiFID II).

With reference to the settlement process, this is impacted by the implementation of the CSD-R i.e. Art. 5 that imposes that all transactions executed on a trading venues need to be settled within 2 days).

²⁴ Directive 2014/65/EC of the European Parliament and of the Council of 15 May 2014 on markets in financial instruments (MiFID II).

²⁵ Namely, those financial instruments which are listed in Section C of Annex I of Directive 2014/65/EU of the European Parliament and of the Council of 15 May 2014 on markets in financial instruments (MIFID II)

²⁶ <http://www.bloomberg.com/professional/blog/how-mifid-ii-will-impact-the-anatomy-of-the-investment-process-trade-life-cycle/>

Having in mind the clearing processes, the incoming MiFID II, that will make central the STP process, must be highlighted. Please see the specific section on future trend.

STP provides for automation and certainty of clearing of the trades executed in a trading venue. In this case, the CCP typically steps into two legally binding agreements with the counterparties immediately upon the trade execution, providing straight-through processing and certainty of clearing through legal construct. In case STP is not granted pre-trade checks at the level of the trading venue shall be provided; in this case all trades would have to be allocated to the clearing broker before their execution, i.e. a post-trade allocation that provides clients with more flexibility to execute their trades would no longer be possible. This particularly affects give-up agreements (see paragraph 3.4.1.1) between clients, executing brokers and clearing brokers which are common market practice. An allocation of trades to the clearing broker prior to their execution would incur substantial costs on the part of clearing brokers and, ultimately, their clients, while providing no additional benefit with respect to pre-trade clearing certainty.

3.2.2. Market Structure

Via MiFID I competition for the previously national organised exchanges was introduced by the new trading framework²⁷.

Since 2007 and the publication of MiFID I, the European trading market structure has changed fundamentally:

- European Bluechips can be traded on different venues; or
- less liquid equities are mainly traded on the regulated market where they are listed.

The assessment by the European Commission on market shares in context of the MiFID Review came to the following results:

On-Exchange vs. OTC Trading (2011)²⁸:

- Equities
 - Predominantly traded on numerous RMs and MTFs
 - 62% traded on trading venues
 - 38% OTC
- Fixed Income (mostly government debt)
 - Predominantly traded OTC
 - 5% on exchange
 - 95% OTC

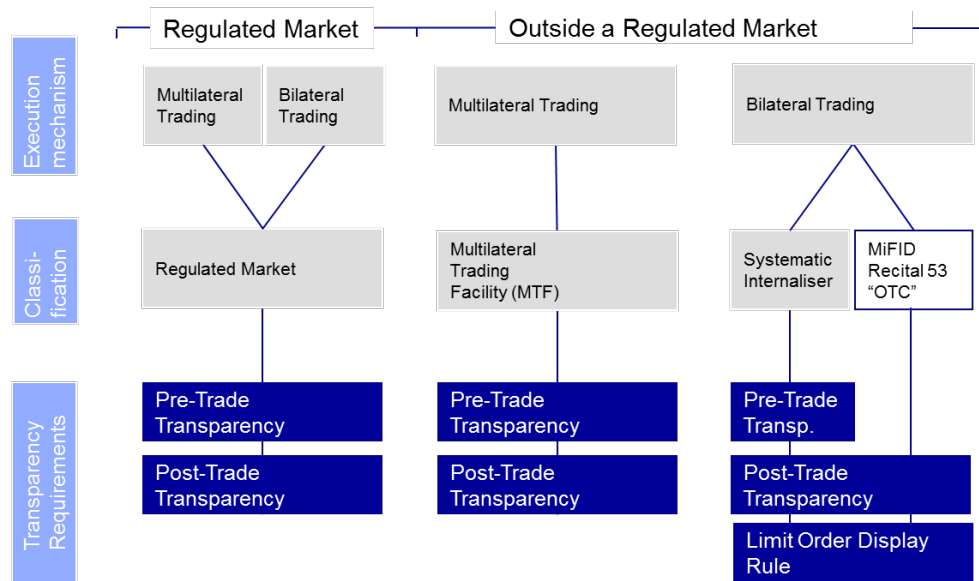
²⁷ MiFID: Spirit and Reality of a European Financial Markets Directive, Celent and Goethe University, September 2010.

²⁸ Commission Impact Assessment to MiFID II/MiFIR Proposals, 20.10.2011, SEC(2011) 1226 final.

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Figure 6: European Trading Market Structure under MiFID



Source: MiFID.

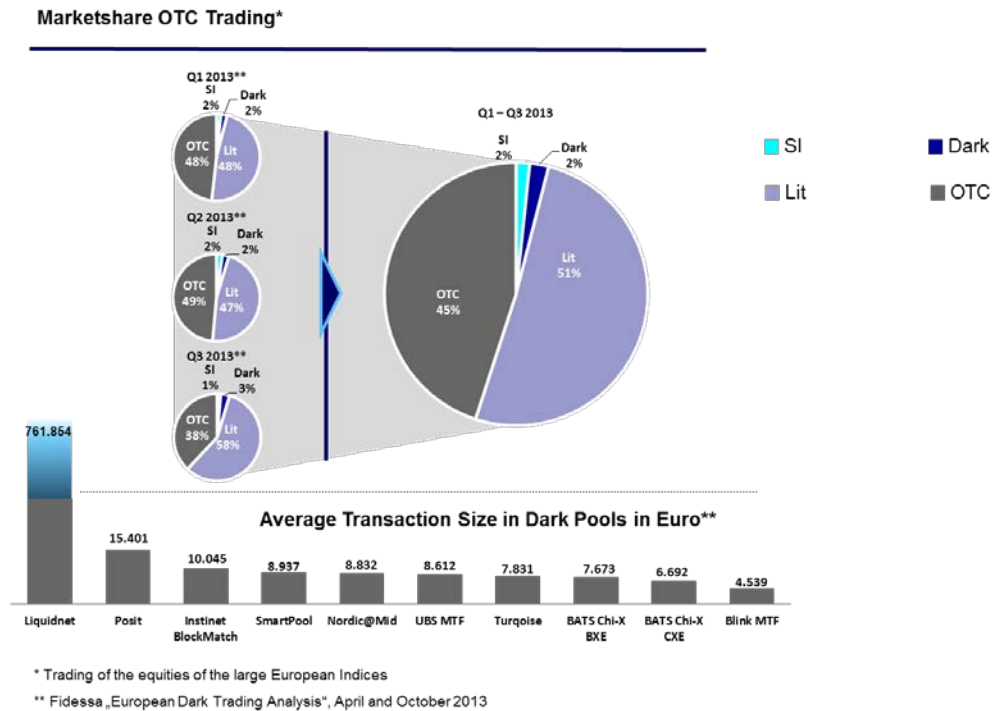
The result of MiFID I is that the types of trading venues in equities markets is more diverse and that a significant share of trading takes place OTC. The Oxera study commissioned by European Commission shows that competition works well and that there has been a general decrease in the costs of using infrastructures for post trading services²⁹.

In total 103 regulated markets and 148 MTFs are authorised while only 11 SIs are authorised³⁰.

²⁹ See Oxera Report 2011 available at http://ec.europa.eu/finance/financial-markets/docs/clearing/2011_oxera_study_en.pdf

³⁰ http://registers.esma.europa.eu/publication/searchRegister?core=esma_registers_mifid_rma, http://registers.esma.europa.eu/publication/searchRegister?core=esma_registers_mifid_mtf and http://registers.esma.europa.eu/publication/searchRegister?core=esma_registers_mifid_sys

Figure 7: Repartition of trading activity



Source: Oxera study.

3.2.3. Future Trends

MiFIR³¹ / MiFID II will introduce a trading obligation for equities starting 2018 that will ensure that more trading takes place on regulated markets, MTFs or SIs. Moreover, MiFIR will extend the transparency and reporting requirements to all liquid financial instruments.

We are currently witnessing a number of efforts by industry participants to adapt to the changes in market structure stipulated by MiFIR / MiFID II, e.g. by setting-up new trading venues (e.g. organised trading facility – OTF), by accommodating existing business models to the new regulatory framework and by developing new functionalities, products and services aligned with trading needs of a wide variety of market participants. Trading and post-trade activity are closely interconnected. The challenge with regard to post-trading remains how to integrate the ongoing changes of the trading landscape described above into a seamlessly interconnected post-trade structure.

Moreover, according to Art. 37(2) of MiFID II, the regulated markets are requested to provide to their member the possibility to designate the settlement system for the settlement of transactions undertaken on that market, subject to the existence of appropriate links between settlement systems. The introduction of T2S as common settlement platform in the euro area is making concrete the possibility of choice for trading participants, between the settlement systems that share the same platform.

³¹ Regulation (EU) No 600/2014 of the European Parliament and of the Council of 15 May 2014 on markets in financial instruments

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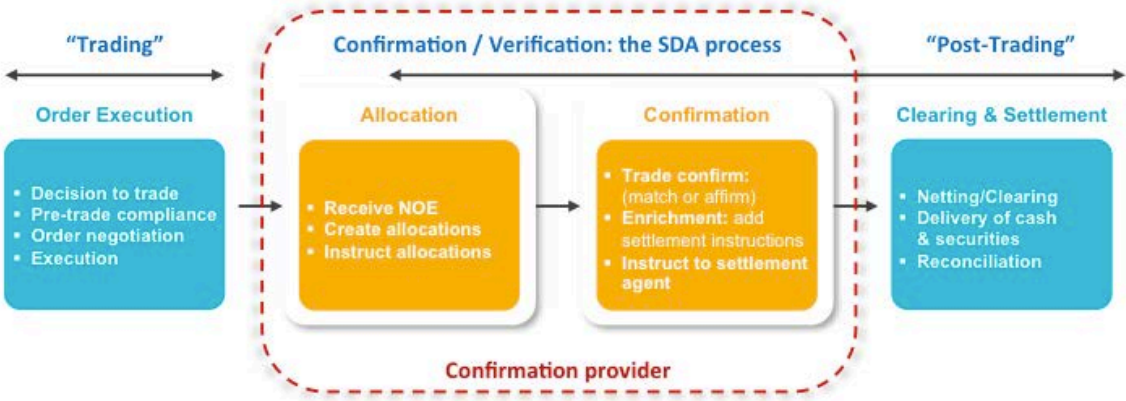
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3.3. Confirmation

3.2.1. Trade order confirmation services

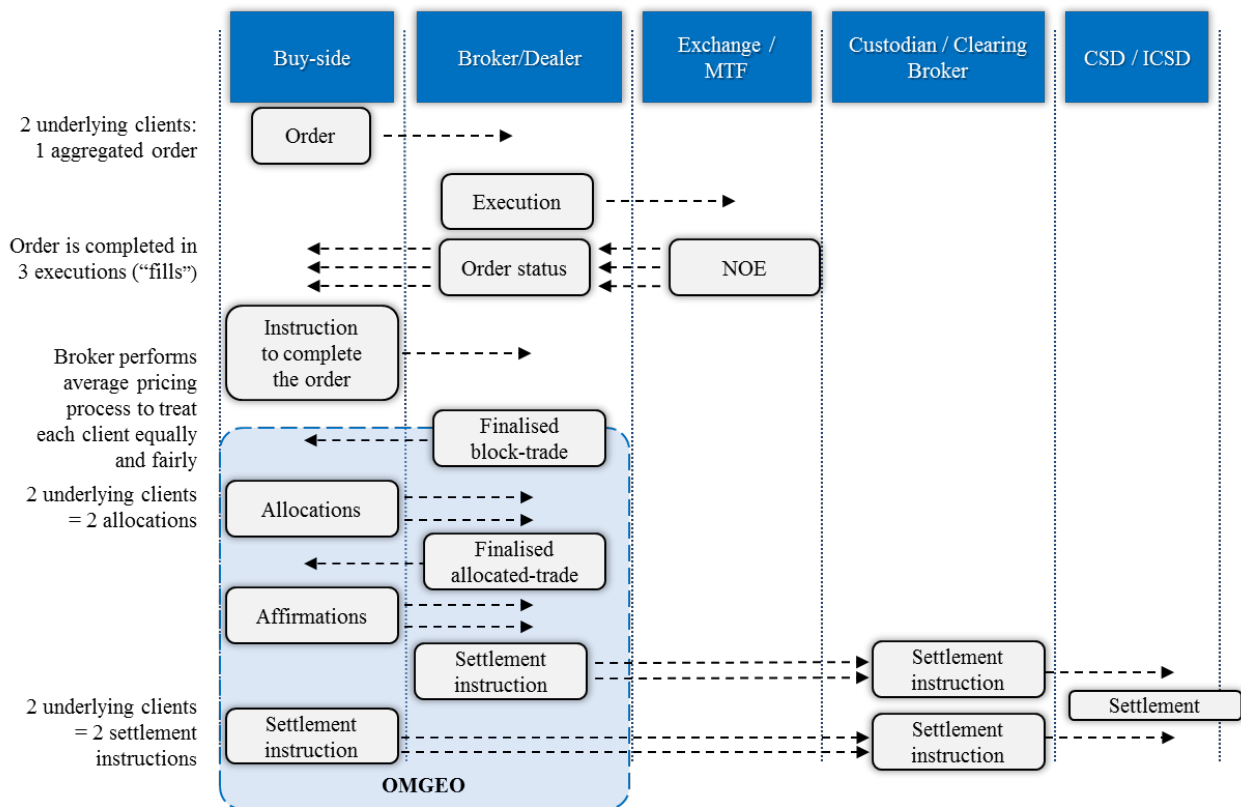
Asset Managers often manage the assets of several institutional investor clients (e.g. funds, pension funds) with similar investment profile. Similarly banks often manage the assets of several retail clients with similar investment profile. When they decide, on behalf of these clients to either purchase or to sell securities they usually group all the purchase or sale orders together and pass one grouped order to the executing broker. The broker executes the order on the exchange and inform the asset manager of the progress in executing the order. Once the execution of the order is finalised, the asset manager send to the broker the allocations of the order among all the clients for which the order was instructed, providing to the broker all the details related to the settlement of each of its client. The pictures below describe the process:

Figure 8: The various steps after a trade is executed



Source: Omgeo documentation.

Figure 9: Trade order flow including affirmation/confirmation



Source: Omgeo documentation.

Confirmation is the kick-off process for subsequent post-trading clearing and settlement activities. Speed and accuracy of confirmation drives the efficiency of the downstream processing. The term “SDA” (stands for Same Day Affirmation) is a generic term used to describe all forms of trade confirmation (bi-lateral matching and confirm/affirm).

It is the standard viewpoint of market participants that equity trades by institutional investors are OTC transactions – because the client is not a direct participant of an exchange. The same factor applies to fixed-income transactions – where the vast majority of trades are conducted off-exchange.

Today broker/dealers and institutional investors most commonly organize their operational processes around a 2 day settlement cycle. Focus needs to be placed earlier in trade lifecycle to maximize the use of properly automated mechanisms for trade confirmation, allocation, rejection and affirmation.

Confirmation Matching: Utilising an electronic platform or mechanism to perform trade confirmation, allocation and affirmation has been proven to increase automation and allows straight through processing (STP) which is a key factor to building a robust settlement process to improve settlement efficiency. However not all institutional clients use electronic means to confirm and allocate transactions, manual methods such as fax, email and telephone are still used to process transactions. The reason for this is usually cost, but there are many behavioural elements that still block automation.

Electronic Trade Confirmation (ETC): Is the very first phase of the life cycle, starting from the conclusion of the trade and should include key trade elements:

- Name of both counterparties (purchaser & seller)

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- Trade date
- Intended Settlement date
- Trade Direction (Purchase/Sale)
- Security identifier (Usually ISIN)
- Quantity (Nominal or Units, dependent on security)
- Trade Price
- Additional charges/fees (Commissions, taxes, Market levies)
- Total cash to be settled
- Static Settlement Instructions (SSI's)
- Place of desired settlement location (CSD)

Block confirmation matching and allocation level confirmation matching: Block level confirmation matching is done at institution level, meaning the two counterparties to the trade are identified and the complete transaction is matched using the above criteria. However many buy-side institutions will 'allocate' numerous underlying funds to the transaction. These are usually described as trade allocations or sub accounts. The buy-side firm will notify the sell side firm of which funds to allocate the transaction to, therefore creating numerous entries that need to be confirmed back to the buy-side firm, by the sell side firm. Once both parties agree the allocations are correct, the trade will move to 'Affirmed Status' and the trade is match agreed and ready to be instructed to settle. This process can be achieved sequentially or centrally when utilising an electronic processing platform. If such a platform is not used, then this process has to be performed manually.

Within the above mentioned Alleged "status" informing parties that someone is claiming for a trade that has not been sent to the market is very important and in this specific case "the sooner, the better" is the approach that will help to avoid failing transactions.

3.4. Clearing

3.4.1. Description

Trading, clearing and settlement are sequential steps in securities transactions. The European Market Infrastructure Regulation (EMIR) defines clearing as "*the process of establishing positions, including the calculation of net obligations, and ensuring that financial instruments, cash, or both, are available to secure the exposures arising from these positions*".

While the EMIR definition of clearing is non-specific as to entity, a common current usage of the term clearing in securities and derivatives markets is the service provided by a central counterparty (CCP)³². Article 2(1) EMIR defines a CCP as "a legal person that interposes itself between the counterparties to the contracts traded on one or more financial markets, becoming the buyer to every seller and the seller to every buyer". Central counterparties provide a guarantee to the parties in a trade that the price agreed will be honoured even if one party is not able to settle the trade due to reasons such as insolvency. It is worthwhile to note that a number of equity markets have opened clearing to competition by giving access to multiple CCPs; a CCP clearing for those markets is not the buyer to *every* seller nor the seller to *every* buyer. Firms that trade on these markets have a choice among the CCPs on offer. The seller and buyer could have chosen different

³² The term *clearing house* in common usage refers to an institution which provides a logistical service in the collection and distribution of items, as distinct from a *central counterparty*, which is an institution which provides an economic guarantee to parties that trade.

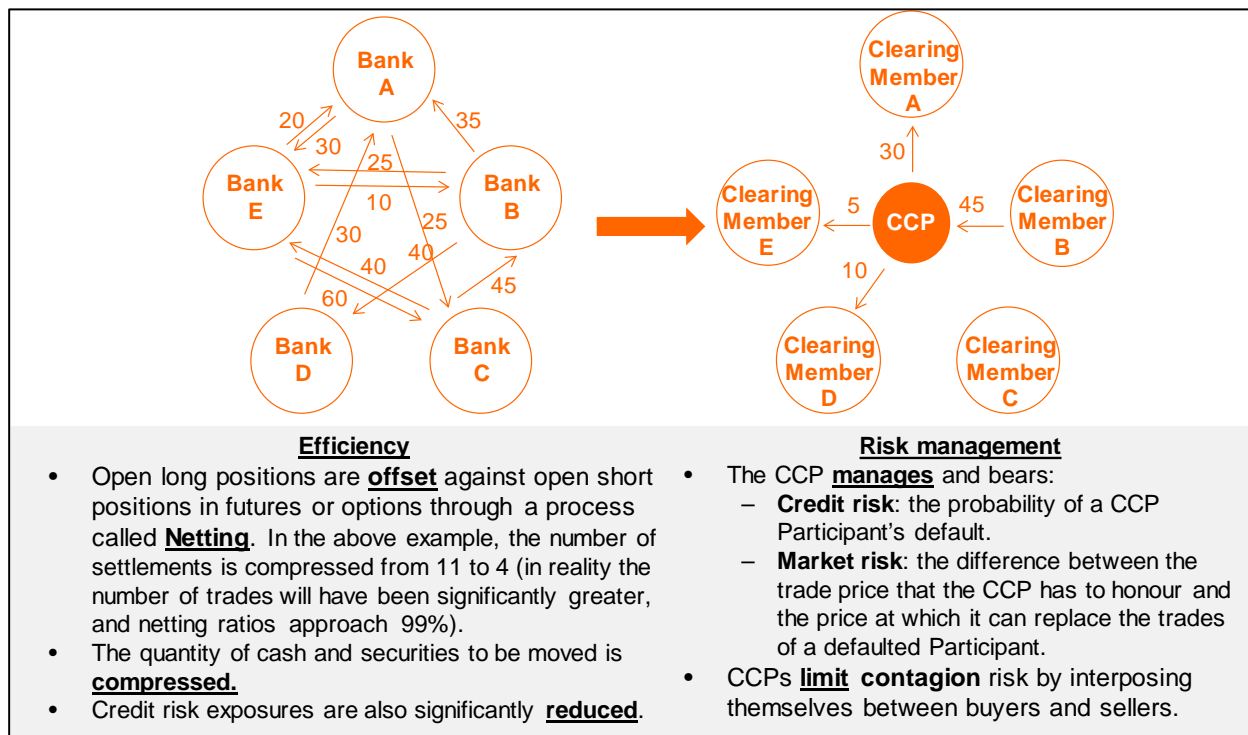
CCPs; each CCP provides the guarantee to its own client and creates a contract between themselves to maintain their match books.

Central clearing in Europe, whereby an entity guarantees trades executed on a market, originated in the commodity futures markets in the 19th century. The firms that trade derivatives contracts need protection against counterparty default during the many months or even years that elapse between trade execution and settlement of obligations at contract expiry. In the European equities market, central counterparty clearing has been widely introduced relatively recently in the early 2000's, with the widespread adoption of electronic order books which removed firms' ability to choose the party on the other side of their trade. Trading firms need protection from unknown counterparties, and CCPs provide them with this service. Before then, counterparty risk was comparatively less important in the equities market because only a few days elapse between trade execution and settlement and because parties could choose the market maker with whom they transacted with. In the fixed income market, bilaterally negotiated transactions are the norm until very recently and CCP clearing is still not widespread.

A second purpose of CCP clearing, particularly in the equities sector, is to lower the all-in cost of trading through netting a large number of trades in the same security into a single settlement obligation. Because the CCP becomes the legal counterparty of each trading firm that uses its service, it is able to rely on the same legal mechanism to net the trades of a firm in the same security into one net settlement obligation against itself. Netting vastly reduces settlement costs; it is not unusual for the number of net settlement obligations to equal less than 1% of the number of trades. After a firm has executed one trade in a security, thanks to netting subsequent trades incur no additional cost of settlement. Netting also has the effect of reducing risk. Through netting purchases and sales of the same security, the amount of exposure is reduced in the system.

CCP clearing brings other benefits as well. A marketplace that is CCP-cleared allows firms to trade anonymously, which protects their trading strategy and thus deepens market liquidity. CCP clearing also provides crucial risk management to markets, limiting the build up of risk in a single entity, and ensures a comprehensive view of risk management during a market crisis, such as the default of a large bank.

Figure 10: Illustration of multilateral netting



Source: EACH, <http://www.eachccp.eu>

3.4.1.1. How does clearing work?

The life cycle of a securities trade, starting from the moment of execution through to settlement, illustrates CCP clearing as a service:

A firm trades on a platform cleared by a CCP where the firm is a clearing member. Through a legal process called novation (or another legal process called open offer which delivers materially the same result), the CCP becomes the firm's counterparty in all its trades. The platform sends details of the firm's trades to the CCP. For securities clearing, at the end of the trading day, the CCP nets all the firm's trades in the same security into a net settlement obligation. The CCP advises the firm the net amount of each security the firm will receive from the CCP or be required to deliver to the CCP, and the corresponding cash amount. On settlement due date two business days later, securities and cash are exchanged in settlement at the CSD and the obligations from all parties are extinguished. The risk that the firm is unable to meet its settlement obligations towards the CCP and the CCP incurring a loss when it has to replace the trade at an unfavourable price is mitigated by collateral the CCP has collected from the firm. If the loss exceeds the collateral from the defaulted member, the CCP uses additional financial resources to cover the loss, as stipulated in the CCP's rule book and by regulations.

Regardless of the scope and range of a CCP's clearing activities, a CCP's business purpose is to provide at a reasonable cost a service that guarantees to its members they would be able to conclude the trade at the price agreed at the time of trade execution even if the other party to the trade becomes insolvent. A CCP's core competence is to hold sufficient collateral at a reasonable cost to members that would cover the CCP's potential losses in the event of a client default. A major element of this competence is default management know-how: minimising the cost of closing out the obligations of a defaulted member.

3.4.1.2. Types of securities transactions cleared

- *Equity*
 - *Equity transactions.* Stock exchanges and MTFs that have implemented CCP clearing require all member firms to be a clearing member of the appointed CCPs or use a General Clearing Member who clears for third parties.
 - *Trades executed on systematic internalisers and OTFs.* The traditional model of the broker operating the network being on one side of every trade to preserve anonymity of the parties can be maintained. Trades on the broker crossing network are novated to a CCP just like trades on stock exchanges and MTFs, with the difference that the broker operating the platform is a party to each trade that is novated. The use of a CCP eliminates counterparty risk and minimises settlement costs for the broker that operates the network. Furthermore, parties that trade on the broker crossing network can have their trades netted with trades in the same stock executed elsewhere, thus also reducing their risks and costs.
 - *Bilaterally transacted over-the-counter (OTC) trades reported to a trading platform or confirmed through a matching service.* These transactions are routed to a CCP by the platform or matching service. Cross-platform netting of these transactions with others in the same stock eliminates duplicated settlement costs.
- *Fixed income transactions.* Historically the fixed income market has been a pure OTC principal to principal market with telephone executions and limited involvement of brokers. This has changed over the last couple of years and an increasing part is now using electronic execution platforms, MTFs or exchanges.
- *Securities financing transactions.* CCPs also clear repurchase and securities lending trades which are essentially collateralised loans. In these markets, trading counterparties agree to a trade consisting of both a sale and a future repurchase of either a single security or a basket of securities. These markets can either be driven by the desire to borrow money (typically, the general collateral or “GC” repo markets) or the desire to obtain a particular security temporarily (typically, “special” repo and large portions of the securities lending market). While the instruments exchanged in such trades are securities or baskets of securities, the risk characteristics of these transactions differ substantially from cash trades since they can remain outstanding for far longer than a few days. For these trades, the CCPs’ risk models need to consider both the securities’ valuation or valuation of the basket as well as the interest rate risk factors. The large size of repo trades is also a risk characteristic of these markets. Securities lending markets are currently only centrally cleared to a very limited extent, and while centrally cleared repo markets are substantial in nominal euros outstanding, they represent a relatively small segment of the broader OTC repo market³³.

3.4.2. Market Structure

3.4.2.1. Market Infrastructures – CCPs

Central counterparties (CCPs) guarantee that trades will be honoured at the price agreed upon. CCPs enable firms to trade with more confidence when a firm cannot choose the party on the other side of the trade, and when there is an elapsed time between trade execution and settlement, during which the other party to the trade could become insolvent and unable to meet its

³³ Estimates of the size of the cleared repo market can be taken from the ICMA report (<http://www.icmagroup.org/Regulatory-Policy-and-Market-Practice/repo-and-collateral-markets/ercc-publications/repo-market-surveys>) and the CCPs’ public quantitative disclosure.

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obligations. CCPs also facilitate netting, which not only reduces settlement costs but also the amount of risk in the financial system.

In 2006, with MiFID putting in place the regulatory environment that enabled multilateral trading facilities (MTFs) to compete with national stock exchanges, new pan-European CCPs were created to service this segment of the market. At that time there were around ten equities CCPs in Europe, most of them serving individual exchanges.

Infrastructures providing the three sequential functions of trading, clearing and settlement – namely exchanges and MTFs, CCPs and CSDs – could be fully vertically integrated under the same ownership or they could be under the control of different parties. Since clearing follows trading in the sequence, a CCP can clear trades only if a trading platform gives it access to its trades to clear. This can naturally be expected for CCPs under the same ownership as the trading platform. Some platforms have given access to a CCP majority-controlled or fully owned by other parties. MiFID II, which comes into effect in January 2018, contains open access provisions subject to risks being adequately mitigated.

Because of CCPs' role in centrally managing risks for financial institutions, they are covered by the European Market Infrastructure Regulation (EMIR) which stipulates safety standards for all aspects of CCP risk management. EMIR has the effect of harmonising the way that CCPs manage risks, although there will always be arrangements such as technical connectivity, report formats, acceptable collateral and default management procedures that are individual to each CCP.

European Market Infrastructures Regulations (EMIR) sets the minimum safety standards for CCPs of all asset classes. These standards include requirements for managing risks associated with member defaults, as well as operational risk, investment risk and liquidity risk. The CCP's risk management is augmented by requirements on corporate governance, including the membership of the CCP's clients and their clients in the CCPs' risk committees, and the proportion and qualifications of independent members of the CCP's board of directors. EMIR also requires CCPs to be authorised (Article 14 ff.) and supervised (Article 22) by a designated regulator in the CCP's home country (i.e. their National Competent Authority). EMIR requirements serve as the unifying standard across the EU. Common safety standards are especially important when CCPs compete. In addition, after preparatory work by the EU Commission³⁴, and in line with the FSB recommendations³⁵, a proposal for a Regulation on CCP recovery and resolution³⁶ has been published by the European Commission to deal with extreme but plausible situations that could cause a CCP's losses to exceed the financial resources stipulated by EMIR.

A European CCP that is authorised by its National Competent Authority under EMIR can provide clearing services anywhere in the EU for the categories of financial instruments to which it has received authorisation. ESMA is entitled to recognize third-country CCPs; the recognition enables them to provide clearing services anywhere in the EU. As of July 2016, there are eleven European Union CCPs authorised and eight third-country CCPs recognised by ESMA to clear securities (this data is referred to CCPs which clear only equity, debt, repo and/or securities lending; for CCPs clearing derivatives, see section X). Of the third-country CCPs, only SIX x-clear incorporated in Switzerland has any substantive activity in clearing European securities traded on European platforms.

³⁴ http://ec.europa.eu/finance/consultations/2012/nonbanks/docs/consultation-document_en.pdf

³⁵ a) www.fsb.org/2016/08/essential-aspects-of-ccp-resolution-planning

b) www.fsb.org/2017/02/guidance-on-central-counterparty-resolution-and-resolution-planning/

³⁶ http://ec.europa.eu/finance/financial-markets/docs/ccp/161128-ccp-proposal_en.pdf

Table B: CCPs Authorised and recognised by ESMA for clearing of equity, debt, repo and/or securities lending

CCP	Equity		Debt		Repo		Sec Lending
	OTC	Regulated Market	OTC	Regulated Market	OTC	Regulated Market	
European Union CCPs							
1. Nasdaq OMX Clearing AB					Y		
2. EuroCCP N.V.	Y	Y					
3. KPDW_CCP	Y	Y	Y	Y	Y		
4. Eurex Clearing AG	Y	Y	Y	Y	Y		Y
5. CC&G	Y	Y	Y	Y	Y	Y	
6. LCH.Clearnet SA	Y	Y	Y	Y	Y		
7. LCH.Clearnet Ltd	Y	Y	Y		Y		
8. Keler CCP		Y		Y			
9. CCP.A		Y		Y			
10. BME Clearing	Y	Y	Y	Y	Y	Y	
11. Athex Clear		Y		Y			Y
Third-country CCPs							
12. SIX x-clear	Y	Y		Y	Y		
13. ASX (Futures) Pty Limited			Y				
14. ASX Clear Pty Limited	Y		Y				
15. Japan Securities Clearing Corporation			Y				
16. Hong Kong Securities Clearing Company Ltd		Y	Y		Y		
17. HKFE Clearing Corporation Limited		Y	Y		Y		
18. Japan Securities Clearing Corporation	Y	Y	Y				
19. JSE Clear	Y	Y	Y	Y			

Source: https://www.esma.europa.eu/sites/default/files/library/ccps_authorized_under_emir.pdf

All European CCPs are also subject to international oversight standards elaborated by the Committee on Payment and Market Infrastructures (CPMI) and the Technical Committee of the International Organization of Securities Commissions (IOSCO) representing central banks and securities regulators respectively. In April 2012, the CPMI and IOSCO published the Principles for Financial Market Infrastructures (PFMI) which cover all aspects of CCP activities such as the legal framework, governance, risk management and efficiency.

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In line with CPMI-IOSCO standards CCPs publish a broad set of quantitative data publicly available on their websites. The disclosure made available by CCPs include close to two hundred fields of quantitative data related to the parameters like credit risk, collateral, margin, liquidity risk, default rules and procedures, etc. This disclosure provides a better understanding of the way CCPs manage risks in financial transactions and deliver efficiency gains³⁷.

3.4.2.2. Service users – Trading platforms and Participants

A CCP needs to have contractual arrangements with two groups of users:

The first group of users is the trade source for which the CCP clears; these trade sources include exchanges, MTFs, trade matching services and broker crossing networks. These trade sources typically do not pay the CCP for clearing trades, but without their appointment, a CCP cannot clear their trades even though there may be demand for the CCP's service from trading firms. As of April 2016, over 99.8% of trades executed on trading platforms operated by members of the Federation of European Securities Exchanges (FESE) located in the EU, EEA and Switzerland are cleared by CCPs. The remaining 0.2% of trades are executed on nine small exchanges that do not use a CCP.

The second group of users comprise the firms who benefit from the CCP's trade guarantee service and who pay service fees to the CCP. These can be proprietary trading firms or brokers, or intermediaries acting as other firms' clearing and settlement agents. Buy-side firms typically do not become members of stock exchanges and MTFs and are not generally direct users of CCP services. Buy-side firms manage their own counterparty risks.

A CCP is required by regulations to have transparent, non-discriminatory criteria in accepting firms it would provide services too. A CCP's paying clients are typically referred to as its members (the term used in EMIR) or participants, due to CCPs' rule-based and loss-sharing business model. Membership requirements would typically include financial soundness and demonstration of appropriate operational capabilities.

Some trading firms do not qualify for membership of a CCP or have decided to outsource the operational work to an intermediary. These intermediaries, frequently called General Clearing Members (GCMs), have the contractual relationship with the CCP and are subject to the CCP's rules, including posting of collateral when due and participating in loss-sharing arrangements. Some banks that provide a GCM service facilitate their clients' access to multiple markets and CCPs.

3.4.2.3. Competition

There are two main ways in which CCPs compete – for the market, or in the market, where “market” means a trade source (i.e., regulated market, multilateral trading facilities, etc.) that appoints a CCP to clear its trades.

When CCPs compete for the market, they try to win the appointment by a platform to be its sole CCP. The appointment could be by a new platform whose business model requires CCP clearing, by an existing platform that has decided to introduce CCP clearing, or by a platform that has decided to replace its incumbent CCP. The first MTFs, which started appearing in 2006, typically chose a single CCP at launch, sometimes selecting from competing bids of different CCPs. There are markets which have been trading without a CCP and when they decide to introduce one, have chosen to appoint a CCP that also clears for another platform. However, there has been no example so far of an

³⁷ Links to European CCPs' public quantitative disclosure <http://www.eachccp.eu/cpmi-iosco-public-quantitative-disclosure/>

incumbent CCP being replaced by a competitor that challenges it, although there have been exchanges that repatriated clearing from a third-party owned CCP to one that they own themselves.

When CCPs compete in the market, they concurrently clear for the same platform and try to win business from each other. When CCPs were first introduced, it was intended that all trades on a platform would be channelled to a single CCP for clearing. Hence the term “central” counterparty and the definition that a CCP is “the buyer to *every* seller and the seller to *every* buyer”. This is no longer true with competitive clearing where multiple CCPs clear for the same trading platform under an arrangement known as interoperability. Interoperability means a trade could be executed between parties each use different CCPs, with each party being indifferent to the choice of the other party.

The demand for competitive clearing arose with the appearance of pan-European platforms that trade the same securities. These platforms initially used different CCPs, which caused the firms that trade the same stock on them having to settle with and pay margin to each CCP. The firms wanted a choice of CCPs on each platform, so that they could direct all their trades in the same security to their CCP of choice. This way, they not only eliminate the cost of multiple settlements and multiple collateral amounts, they also receive capital efficiencies through margin offsets from their CCP of choice.

Competitive clearing in equities among multiple CCPs clearing concurrently on the same platform was introduced in 2011 by a pan-European trading platform, BATS Europe. It appointed three additional CCPs to clear for it concurrently with the incumbent CCP, giving trading firms a choice of CCPs. Several other pan-European trading platforms followed. By April 2016, trading platforms which account for 71% of trades on regulated markets, including four national stock exchanges, offer a choice of two or more CCPs by giving their trade feed to multiple CCPs.

Because of the compelling savings to a firm of consolidating its clearing with a single CCP, the CCPs need to compete on the broadest access to trading platforms. Whether a platform gives a CCP access to clear its trades is a decision that can be influenced by a variety of factors.

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Table C: Status of Competitive Clearing in Equities, April 2016

Regulated Market	Daily Average Trade Sides				Accessible by CCP for clearing									
	Volume	%	Clearing Arrangement		Competitive Access***			Sole Access						
			Cleared	Competitively Cleared	EuroCCP	LCH Ltd	SIX x-clear	Athex Clear	BME Clear	CC&G	CCP.A	Eurex	LCH S.A. or Ltd	KPDW CCP
Pan-European Platforms														
Aquis Exchange	103,375	1%	103,375	103,375	103,375	103,375	103,375	103,375						
Bats Europe	4,579,645	31%	4,579,645	4,579,645	4,579,645	4,579,645	4,579,645	4,579,645						
SmartPool	2,064	0%	2,064		2,064									
Turquoise	2,451,358	17%	2,451,358	2,451,358	2,451,358	2,451,358	2,451,358							
Equiduct*	74,301	1%	74,301											
National Platforms														
London Stock Exchange**	1,852,298	13%	1,852,298	1,852,298	1,852,298	1,852,298	1,852,298							
Nasdaq OMX Nordic	887,422	6%	887,422	887,422	887,422	887,422	887,422							
Oslo Børs	189,721	1%	189,721	189,721		189,721	189,721							
SIX Swiss Exchange	330,136	2%	330,136	330,136		330,136	330,136							
Athens Exchange	35,677	0%	35,677					35,677						
BME (Spanish Exchanges)	436,406	3%	436,406					436,406						
Borsa Italiana**	636,083	4%	636,083						636,083					
CEESEG - Vienna	47,687	0%	47,687						47,687					
Deutsche Börse	1,032,080	7%	1,032,080							1,032,080				
Euronext	1,719,385	12%	1,719,385								1,719,385			
Irish Stock Exchange	24,744	0%	24,744							24,744				
Luxembourg Stock Exchange	81	0%									81			
Warsaw Stock Exchange	138,146	1%	138,146									138,146		
Boerse Stuttgart	11,666	0%												
Bucharest Stock Exchange	4,426	0%												
Bulgarian Stock Exchange	229	0%												
CEESEG - Budapest	10,127	0%												
CEESEG - Ljubljana	287	0%												
CEESEG - Prague	5,979	0%												
Cyprus Stock Exchange	219	0%												
Malta Stock Exchange	80	0%												
Total	14,573,620	100%	14,540,527	10,393,954	9,876,161	10,393,954	9,506,532	35,677	436,406	636,083	47,687	1,056,823	1,719,466	138,146
% of Total	100%		99.8%	71.3%	67.8%	71.3%	65.2%	0.2%	3.0%	4.4%	0.3%	7.3%	11.8%	0.9%

Source: Federation of European Securities Exchanges. Each trade has 2 trade sides: buy side and sell side.

- * Equiduct has a unique clearing model. It uses separate and sole CCPs for each market segment: EuroCCP for Spain; LCH Ltd for UK and Italy, LCH S.A. for Belgium, France, Netherlands and Portugal; SIX x-clear for Germany, Switzerland, Nasdaq OMX Nordic. The exception is Belgium, France, Netherlands and Portugal where if both sides to a trade have elected either EuroCCP or x-clear, then the trade is cleared by these CCPs instead of LCH S.A. Volume accessible by each CCP is not publicly available.
- ** FESE data for London Stock Exchange Group (LSEG) split into LSE and Borsa Italiana according to data published on LSEG website. London Stock Exchange SETS order book competitively cleared; International Order Book cleared solely by LCH Ltd.
- *** Access to markets is not equal. NasdaqOMX Nordic and SIX Swiss Exchange has given access to all three CCPs, pending implementation.

The concern is sometimes raised that competition for efficiency could jeopardise safety as CCPs might be tempted to require a lower amount of collateral than is prudent. Other concerns include broader type of eligible collateral, more lax concentration limits, accepting collateral without properly mitigation of specific wrong-way risk. These concerns are mitigated by the high common safety standards for CCPs set by EMIR and in line with the CPMI-IOSCO PFMI which include safety requirements for margin models, collateral funding, and interoperability, and by CCPs being independently tested by ESMA in their resiliency. CCP margin and collateral requirements are reviewed by their NCA and are publicly reported through their rulebooks and CPMI IOSCO qualitative disclosures of margin and collateral requirements ensure that CCPs do not compete on risk standards.

CCPs that concurrently clear for a platform through interoperability provide a guarantee to their own respective members and become each other's counterparty. The exposure that each interoperating CCP has to the other's ability to honour the obligations is mitigated by collateral they collect from each other. To avoid contagion or systemic risk when an interoperating CCP has a large member default, the CCPs do not participate in each other's loss sharing arrangements. Furthermore, an interoperating CCP retains its rights to the collateral provided to another interoperating CCP in the event that the collateral taker becomes insolvent. This is unusual in that

in the EU acquis normally only provides one-sided protection, i.e., it protects the collateral taker in the insolvency of the collateral provider³⁸.

The European Systemic Risk Board and ESMA have both published papers on the benefits and risks associated with interoperability³⁹.

3.4.2.4. Efficiency

Efficiency is usually defined in relative terms, comparing the quantity of resources used to generate a unit of output within a specific amount of time. The comparison can be made in the performance between different entities at a moment in time, in the same entity over time, or both.

In the context of this paper's purpose to identify barriers for investors to interact efficiently cross-border, the following aspects that affect the efficiency of CCP clearing are relevant.

- CCP clearing is a high fixed-cost data processing business. The lowest unit processing cost would be achieved via a single CCP through which all transactions in the same asset class are cleared.
- While a single CCP would, in theory, provide the lowest unit cost, in practice, the industry, as with any active market, likely benefits from competition in order to ensure dynamic efficiency over time for the benefit of users.
- Multilateral netting reduces settlement costs and collateral requirements. The maximum saving in settlement cost and collateral requirements would result from one CCP netting all the transactions of a firm in the same security with the same expected settlement date into a single settlement obligation.

At present, the same securities are traded on multiple platforms and cleared by multiple CCPs. For a firm that trades the same securities on multiple platforms, it could only maximise the benefits of netting if it could use a single CCP through which its trades in the same security would be cleared. This requires the single CCP to have access to all platforms on which the firm trades that security. However, this doesn't mean that all securities the firm trades need to be routed through the same CCP.

3.4.3. Market Practices

CCPs run two main clearing processes in parallel:

The first one is an operations process which includes trade capture, netting and settlement. The CCP clearing service starts at the moment the CCP guarantees a trade and ends when the obligation is settled.

The second one is a risk management process which includes three main activities: margining of members' obligations, managing a loss-sharing mechanism called a default fund, and, when required, close out the obligations of a defaulted member.

³⁸ Article 9(1)(2) of Directive 98/26/EC (amendment introduced by EMIR).

³⁹ ESRB report to the European Commission on the systemic risk implications of CCP interoperability arrangements, January 2016; ESMA: Possible systemic risk and cost implications of interoperability arrangements, March 2016.

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3.4.3.1. Operations process

3.4.3.1.1. Trade capture

Trades are transmitted to the CCP by the trading platform or by the clearing members (e.g. repos) using protocols. The choice is generally that of the platform. Although there is a variety of technology and formats, the CCP builds interfaces to accommodate the differences.

The most important function of CCP clearing is to reduce and centrally manage counterparty risks for firms that trade with each other. The CCP provides the guarantee via legal novation, which results in the CCP becoming the party with the obligation to settle the trade with each transacting party. A CCP's rule book will define the moment when novation occurs and the CCP's trade guarantee service starts. The earliest moment the guarantee starts would be upon execution of the trade. In order for the CCP to know its obligations and be able to manage its exposure accordingly, the trade needs to be transmitted to the CCP by the trade source as quickly as possible after novation.

3.4.3.1.2. Multilateral netting

Multilateral netting brings significant benefits in reducing risks and improving capital efficiencies.. Netting by novation involves summing all purchases and all sales in the same security and deriving a net obligation that replaces the individual transactions. Netting can be bilateral between two parties. Multilateral netting among many parties is facilitated by a central entity such as a CCP to which securities are delivered by net sellers and from which securities are collected by net buyers.

A CCP can net all trades in the same security a firm executes into a single settlement obligation regardless of where the trade is executed, provided the CCP has access to the trade source, such as stock exchanges, MTFs and trade confirmation systems. Cross-platform netting reduces the all-in cost of trading and the level of risks in the financial system. CCPs are not Security Settlement Systems (SSS) but have to be designated as a "System" under the Settlement Finality Directive (SFD) in order to become authorised, Article 17(4) EMIR.

For repo and securities lending trades, the value of netting increases if multiple outstanding but partially offsetting legs exist. For centrally cleared repo, netting delivers a substantial benefit as a participant's mix of outstanding loans and borrowings can be collateralised as a single net position (albeit with minor repo rates to be paid at their respective term dates).

Securities CCPs in the EU net transactions via two models, trade date netting or continuous net settlement (CNS). A firm trading on platforms cleared by CCPs using different netting models will need to process settlement of the net obligations in two different ways, even if some securities are identical.

Trade date netting is the model most commonly used among securities CCPs. Trades executed on organised trading platforms in the EU settle on the second business day after trade date, commonly referred to as T+2. At the end of each trading day, the CCP nets a firm's buy trades and sell trades in the same security on the same day into a single delivery or receipt obligation against the CCP, which will be settled two days later. On settlement due date, if an obligation does not fully settle as scheduled, repeated attempts would be made to settle that obligation on each subsequent day. The obligations that result from netting the trades on each trading day are kept distinct from each other.

Continuous net settlement (CNS) is not common but is used by at least one equity CCP which accounts for about 12% of volumes traded in Europe. The "continuous" aspect of this type of netting means continuous forwarding of failed settlements into the netting of the following day's trades. If an obligation does not settle in full on the intended settlement date of T+2, then the

settlement instruction is cancelled and the unsettled amount is included in the netting of the trades on the following day, to yield a single settlement obligation that incorporates obligations from both days.

3.4.3.1.3. End of process

The CCP's trade guarantee function extinguishes at settlement. Settlement delays therefore increase risk in the clearing system.

Whether a CCP operates trade date netting or CNS, the settlement obligation per security is instructed to the CSD where settlement occurs. CCPs have chosen different operations models for settlement. A number of factors influence their choice: many CCPs and CSDs are under common ownership of stock exchange groups and this invariably means the CCP is a direct member of the CSD. Independent CCPs may want to optimise settlement efficiency through direct access to CSDs, or they may choose to use the services of an agent bank for operational simplicity and various commercial reasons. The firms that settle with CCPs can use any operations model for settlement and they are unaffected by the model chosen by the CCP.

Since all parties settle with the CCP, it can manage failed deliveries to it in a way which optimises onward deliveries to waiting parties and thereby minimise the impact of failed settlements. CCPs use a variety of tools to accomplish this, often in collaboration with clients, their settlement agents⁴⁰ and CSDs.

Some CSDs recognise that a CCP stands in the middle of many settlements and have implemented a variety of measures to help CCPs to settle obligations on time in order to avoid knock-on effects in the rest of the market. Some CSDs give priority to CCP transactions and settle them first. Some CSDs allow the CCP to transmit settlement instructions not only for its own account but also for the account of its members, to eliminate unmatched settlement instructions that could delay settlement. Some CSDs automatically partial large settlements that otherwise would not settle into smaller lots to maximise the value settled and increase market liquidity.

CCPs have been mandated to enforce measures stipulated by the Short Selling Regulation⁴¹. CCPs are required to impose fines on firms which fail to deliver stock on due date and to administer buy-in of the stock if the obligation fails beyond four⁴² business days. This role will continue until the full implementation of the CSD Regulation, when late settlement fines will be levied by CCPs as agents for the CSDs.

3.4.3.2. Risk Management Process

A CCP's primary tool for risk management is the collateral collected from members that should be adequate to cover losses that the CCP might incur in the event of the collateral-giver's insolvency under extreme but plausible market conditions. The legal rights and obligations of a CCP and its clients in respect of how risk exposures are managed, including loss-sharing provisions in the event a defaulted member's collateral is insufficient, are specified in a CCP's rule book.

⁴⁰ Definition 'settlement agent': 'settlement agent' shall mean an entity providing to institutions and/or a central counterparty participating in systems, settlement accounts through which transfer orders within such systems are settled and, as the case may be, extending credit to those institutions and/or central counterparties for settlement purposes (Art 2 DIRECTIVE 98/26/EC)

⁴¹ Regulation (EU) No 236/2012 of the European Parliament and of the Council of 14 March 2012 on short selling and certain aspects of credit default swaps.

⁴² Four business days is the general timeline, other instruments have a different timeline.

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3.4.3.2.1. Margin calculation and collection of collateral

The exposure a CCP has against a member is equal to all the unsettled obligations of the member, minus received collateral, plus market risk haircut, plus other forms of risk to the extent they are uncollateralised (operational risk, residual risk etc.). In a market that settles two days after trade date, at any moment the CCP's exposure to a member would equal the value of net unsettled obligations resulting from two days' trading plus obligations that have not settled on due date. The amount of exposure to the member would change throughout a business day when obligations settle in the CSD and when the member's new trades are novated to the CCP according to the timing specified in the CCP's rule book.

The CCP continuously monitors changes to its exposure by marking the member's open net obligations to market value, using the most recent and available trade price information. If the exposure to a member exceeds the CCP's risk management policy threshold during the day, the CCP would initiate steps to collect collateral from the member. At the end of the trading day, when net obligations by security by member have been determined, the CCP would calculate the amount of collateral it requires from each member and collect it in the most expedient way if the amount required is higher than what the CCP already has on hand from the member.

The exposure a CCP manages is essentially systemic risk. A CCP absorbs the multiple counterparty risks that exist in one or more markets that the CCP clears and that is subsequent to trading. The margin required to cover this risk consists of two price movement components: the magnitude of historical changes or volatility in a security's price over time, commonly called initial margin, and the actual market price movement of the security compared to the price agreed at trade execution, commonly called variation margin. CCPs' margin calculation programs assume a liquidation period when prices could move adversely between the initiation and completion of the close-out of a defaulted member's obligations. The program should also take into account price correlations, position concentration, liquidity, etc. The availability of fresh and accurate market prices is crucial to the CCP in the calculation of required margin.

3.4.3.2.2. Default Fund Management and Collection

To cover the risk that a defaulter's collateral might prove insufficient, CCPs are required by EMIR and industry best practice to provide a layer of their own funding to cover losses from the default prior to accessing their loss sharing tools. If the losses exceed even this amount, especially during stressful market conditions despite due care and diligence of the CCP, CCPs have a loss-sharing mechanism called a default fund to mutualise the excess loss among the non-defaulting members. All members are required to contribute to the default fund according to the risk of their portfolio, as calculated using formulas which are specified in the CCP's rule book. The timing of collection of contributions from members varies by CCP.

To ensure that the level of financial resources is sufficient for the transactions they clear, CCPs are required⁴³ to conduct regular validation of their risk management applications that calculate collateral requirements and default fund contributions, and to demonstrate sufficient resources through:

- Stress tests
- Liquidity tests
- Back tests
- Sensitivity tests

⁴³ Article 42 EMIR –

<http://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32012R0648&from=EN>

- Reverse stress tests
- Independent tests
- Default management tests

In addition, ESMA conducts EU-wide stress tests using the same stress scenarios for specific sample days. By using standard parameters, ESMA can compare the robustness of all CCPs' financial resources to withstand extreme market conditions. The results of the test showed that European CCPs are resilient and well equipped to withstand extreme market developments. The 'results indicate that for the reporting dates the system of European CCPs can overall be assessed as resilient to the scenarios used to model extreme and plausible market developments', 'no scenarios have been identified that are expected to be plausible and have at the same time a destabilising systemic impact on an EU-wide level' and that the 'analysis of the concentration of exposures in CCPs does not suggest emerging systemic risks at the CCP or EU-wide level'. This exercise has given ESMA the evidence basis to confirm that European CCPs are resilient to counterparty credit risk and therefore reduce systemic risk, and ensuring safer and more efficient financial markets⁴⁴.

3.4.3.2.3. Default Management

After a CCP has declared a member to be in default, it closes out the defaulter's open positions to return to a balanced book. Essentially this means that if the defaulted member has a net delivery obligation to the CCP, the CCP will buy securities at the prevailing market price for onward delivery to members who are net receivers. If the defaulted member has a net receipt of securities, the CCP would sell the position at the prevailing market price. Regardless of the market price movement, the CCP fulfils the obligation of the defaulter to take or make delivery of the securities at the price originally agreed with the other party. Therefore, the close-out exercise could result in either an overall profit or a loss for the CCP.

For securities lending or repo transactions, the CCP will typically liquidate the open trade by entering into a new counter repo trade which nets out the outstanding term leg, as well as the necessary cash trade to obtain the securities necessary for this, or to sell securities that result from this. The CCP will thus fulfil both the securities and cash component of the unbalanced term leg resulting from the default, as well as cover any change in repo or loan rates.

EMIR stipulates the sequence in which the financial resources available to a CCP must be used in the event of a member default; this is commonly called the default waterfall:

- Defaulter's collateral;
- Defaulter's contribution to a loss-sharing fund (default fund);
- A portion of the CCP's own funds ("Skin in the game");
- Non-defaulting members' contribution to the default fund.

CCPs are required under EMIR to have a minimum level of capital which includes a "skin in the game" amount; CCPs are also required to have in their capital sufficient funds for an orderly wind-down of their operations.

⁴⁴ Results of the ESMA EU-wide Stress Test exercise (ESMA, 2016)
https://www.esma.europa.eu/sites/default/files/library/2016-658_ccp_stress_test_report_2015.pdf

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3.4.4. Future Trends / Impacts

3.4.4.1. Regulations

Regulations will continue to drive developments in central counterparty clearing as regulations are implemented more broadly around the world. Regulators will continue to monitor regulatory safety standards for CCPs as more transactions become cleared by CCPs.

At the global level, clearing regulation is largely guided by CPMI-IOSCO Principles for Financial Markets Infrastructures (2012) as well as international obligations such as those under Basel 3. At the EU level, the key legislative drivers of change besides EMIR are CRD IV⁴⁵, MiFID II, CSDR (buy-in regimes) and the ongoing CCP Recovery and Resolution discussions.

Resilience, recovery and resolution are the means to make CCPs safe as individual enterprises. A broader concern about safety is the connectedness of market infrastructures through large financial institutions that are common members of multiple CCPs both within the EU and beyond. Analysis on this aspect of systemic safety is being undertaken through various initiatives led by the Financial Stability Board⁴⁶ and CPMI-IOSCO⁴⁷ in which EU institutions participate.

CCPs have performed extremely well during the recent financial crisis effectively reducing counterparty and contagion risk. The robustness of CCPs has been further strengthened by EMIR the safety standards and stress testing provisions. Notwithstanding this, CCPs need to be ready for the extreme scenario, far worse than that experienced at the height of the financial crisis in 2008, of potential losses that might exhaust a CCP's financial resources as defined in its default waterfall. For this reason, the European Commission has published a Regulation's proposal⁴⁸ that requires a CCP to define in advance a recovery plan which will contain enforceable measures it will use to replenish its financial resources to the level which enables it to continue to meet EMIR requirements.

In addition, the legislation requires the identification of an enforceable resolution plan to be used in the event that the recovery of a systemically important CCP is not feasible, whereby a resolution authority will have the authority to take control of the CCP and ensure the continuation of services that are vital to the functioning of the financial markets.

3.4.4.2. Cost Efficiency

Due to cost pressures among financial institutions, the demand for cost efficient but safe and stable clearing is obvious. Eliminating multiple settlement costs for a security traded on the same day on different platforms and cleared by different CCPs is the primary means to make this possible.

3.4.4.3. Capital Efficiency

Banks face increased capital requirements as a consequence of CRD IV. The lower capital requirements for obligations towards a CCP compared to other financial institutions have created the incentive for banks to put more types of transactions through CCP clearing. The savings in capital requirements will increase the banks' capacity to do business.

⁴⁵ Directive 2013/36/EU of the European Parliament and of the Council of 26 June 2013 on access to the activity of credit institutions and the prudential supervision of credit institutions and investment firms.

⁴⁶ <http://www.fsb.org/2015/09/2015-ccp-workplan>

⁴⁷ <http://www.bis.org/cpmi/publ/d121.pdf>

⁴⁸ http://ec.europa.eu/finance/financial-markets/docs/ccp/161128-ccp-proposal_en.pdf

3.4.4.4. Collateral Efficiency

Market participants are increasingly looking for clearing solutions which provide them optimal collateral efficiency across a broad set of assets. Accordingly, CCPs which clear multiple asset classes have been investing in more sophisticated solutions to manage efficient collateral allocation and usage of capital for margining purposes. A number of CSDs, clearing and settlement agents and global custodians are likewise developing solutions to mobilise collateral efficiently to meet the requirements of their clients' various CCPs.

3.5. Settlement

3.5.1. Description

Settlement is the process– whereby, after a trade has been carried out, the buyer receives the purchased securities and the seller receives the corresponding cash in exchange for those securities. CSDR defines settlement as “*the completion of a securities transaction where it is concluded with the aim of discharging the obligations of the parties to that transaction through the transfer of cash or securities, or both*”⁴⁹. In addition the ECB glossary⁵⁰ defines *settlement* broadly as “*the completion of a transaction or of processing with the aim of discharging participants' obligations through the transfer of funds and/or securities*”. Settlement transactions occur from the point a security is created and is first distributed to subscribers for the first time and onwards during its lifecycle.

In the case of securities transactions, settlement normally occurs two business days after trade date to allow for a certain number of cash funding and processing steps to occur, which ensures a much higher degree of control and efficiency, as required for the processing of high volumes and values of securities transactions.

Settlement activity can be measured by the number of transactions and/or the turnover amount (i.e. the total value of the settled trades). Various international sources of settlements statistics are available, for example the ECSDA Factbook⁵¹ or the ECB Statistical Data Warehouse and “Blue Book”⁵².

The exchange of cash and securities is normally carried out in a Securities Settlement System (SSS) operated by a CSD and by corresponding debits and credits of securities throughout the custody chain, although physical securities will continue to exist in EU markets for a decade or so⁵³. Generally, this exchange is done via Delivery vs Payment (DvP). DvP can be defined as a securities settlement mechanism which links a securities transfer and a funds transfer in such a way as to ensure that delivery occurs if – and only if – the corresponding payment occurs⁵⁴.

There are specific identifiable settlement models established by the Bank for International Settlement (BIS) that form the basis of a “best practice” (these are described in further detail in the section “Types and Models of Settlement” below).

Furthermore, there is a further distinction to be made between the quality of funds or “cash”, used in a settlement transaction which can be either “central bank money” or “commercial bank money”;

⁴⁹ CSDR, Article 2(1)(7).

⁵⁰ <https://www.ecb.europa.eu/home/glossary/html/glosss.en.html>

⁵¹ See the online database and the printable Factbook at <http://ecsd.eu/facts>

⁵² <https://www.ecb.europa.eu/paym/intro/book/html/index.en.html>

⁵³ Please refer to Section 3.1.2.

⁵⁴ <https://www.ecb.europa.eu/home/glossary/html/glossd.en.html>

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this is often determined by the institution at which the settlement transaction is being executed i.e. where the liability of the money in question resides and therefore maintains different risk profiles.

3.5.2. Market Structure

In addition to securities settlement, the activities relevant for this section are general post-trade services, combining matching, clearing, and custody, which are described elsewhere in the report. The main players in the process are CSDs, Central Banks and custodians as CSD Participants. We will further outline the responsibilities of each actor in the following sections.

3.5.2.1. Market Infrastructures – CSDs

Regulation (EU) No 909/2014 of the European Parliament and of the Council on improving securities settlement in the EU and on central securities depositories” (i.e. the CSDR), provides a granular definition of a CSD based on the services it provides; i.e. a CSD is a legal person that operates a SSS and provides at least one of the following two core services: notary service and/or central maintenance service including settlement and safekeeping services (CSDR Art. 2).

National CSDs and international CSDs (ICSDs) are operators of Securities Settlement Systems as defined under CSDR and mainly handle commercial securities, while depositories for government securities were largely managed by CSDs/SSSs operated by central banks. From a settlements processing perspective, the main difference between CSDs and ICSDs is their processing of settlement in Central Bank Money in the case of CSDs or in Commercial Bank Money in the case of ICSDs.

Historically, CSDs across Europe have been established along national lines (on the basis of legal statute or as a specialised financial institution) to provide a local venue for the settlement of securities at the level of a national exchange. The listing practices and needs of local investors, as well as national legal and regulatory concepts and traditions, have driven the development of domestic services.

All CSDs in Europe are subject to national laws in the country in which they are incorporated. Often, national securities law contains a section on the role and responsibilities of the CSDs and there may even be a dedicated legal act establishing the CSD regulatory and operational framework. In addition to being regulated as central securities depositories, six European or European Economic Area (EEA) CSDs (OeKB CSD, Euroclear Bank, KELER, Clearstream Banking Frankfurt, Clearstream Banking Luxembourg, SIX-SIS) operate with a banking license and therefore are also subject to the relevant banking laws of the jurisdiction in which they are incorporated. Furthermore, the 32 CSDs established in the European Economic Area (EEA) are subject to EU legislation, including the CSDR.

With the exception of some CSDs (Euroclear Belgium, Estonian CSD, ATHEXCSD and globeSettle), most CSDs established in a euro area country are eligible securities settlement systems (SSSs) under the Eurosystem assessment framework, which means that they can be used by their participants for mobilising collateral to secure central bank credit in the context of Eurosystem credit operations (including intraday credit)⁵⁵.

Finally, all European CSDs are also subject to international oversight standards elaborated by the Committee on Payment and Market Infrastructures (CPMI) and the technical committee of the International Organization of Securities Commissions (IOSCO), representing central banks and securities regulators respectively. In April 2012, the CPMI and IOSCO published the Principles for Financial Market Infrastructures (PFMI) which replace the former Recommendations for securities

⁵⁵ List of eligible SSSs: <https://www.ecb.europa.eu/paym/coll/coll/eligiblesss/html/index.en.html>

settlement systems, and cover all aspects of CSD activities such as the legal framework, governance, risk management and efficiency⁵⁶. This detailed descriptions and disclosure subsequently forms a significant part of the regulatory oversight conducted by both national regulators (also referred to as national competent authorities (NCAs) and international/cross border organisations such as the International Monetary Fund (IMF) as part of their country assessments.

Table D: Relevant Laws and Rules

Laws and Rules	Author	Year
Settlement Finality Directive	European Union	1998
CPMI-IOSCO Principles for Financial Market Infrastructures	CPMI-IOSCO	2012
Eurosysteem Assessment Framework for SSSs and links	Eurosysteem	2014
CSD Regulation	European Union	2014

Competition in the CSD space

In addition to the impact of T2S on competition among CSDs (further down), other factors are making the CSD landscape increasingly competitive:

- CSDR provisions on issuer choice (art. 49) and the passporting of CSD services (art. 23)
- Access considerations in MiFID and EMIR address “vertical access” whereby CSD can service trading venues or CCPs in different markets. In practice however, some CSDs still find it difficult to operate with some CCPs or trading venues when the latter decide to opt for a “silo” model.
- Competition with non-EU CSDs. Outside Europe, most CSDs operate in a monopoly environment and do not allow third party CSDs to access their domestic market. There is a lack of “reciprocity” in third country access provisions.
- Competition outside the infrastructure space, e.g. settlement internalisation

3.5.2.2. CSD Links

A CSD link is an arrangement allowing a CSD to give its clients access to securities issued in another CSD, without requiring these clients to be direct participants in the other CSD. Links are thus an important means to facilitate cross-border securities transactions and they contribute to market integration.

Table E: Definitions of CSD links⁵⁷

Direct link	A CSD A (called the "investor CSD") has as an account in CSD B (called the "issuer CSD").
Direct link (operated)	A CSD A (called the "investor CSD") has as an account in CSD B (called the "issuer CSD"), and the management of the account is outsourced to a third party (typically a reputable custodian bank acting as "operator").

⁵⁶ <http://www.bis.org/cpmi/publ/d101a.pdf>

⁵⁷ NB: these definitions are broadly in line with those in CSDR.

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Indirect link	A CSD A has account with an intermediary (called "sub-custodian") which holds securities on behalf of CSD A at CSD B. The intermediary is a direct participant in CSD B. CSD A is not.
Investor CSD	A CSD which holds a securities accounts in the books of another CSD (the "issuer CSD") in order to allow its participants to hold securities issued in this other CSD.
Issuer CSD (issuing CSD)	A CSD in which securities are issued (or immobilised). The issuer CSD opens accounts allowing investors (in a direct holding system) and / or intermediaries (including investor CSDs) to hold these securities.
Relayed link	A CSD A has account with a CSD C (called "the middle CSD") which holds securities on behalf of CSD A at CSD B. CSD C is a direct participant in CSD B. CSD A is not.

Source: ECSDA, http://ecsda.eu/wp-content/uploads/2016_07_29_CSD_Links_Overview.pdf

European CSDs operate a dense network of links. All EU CSDs have opened at least one account in another CSD as "investor CSD", except globeSettle (Luxembourg) and KDD (Slovenia).

If we set aside the two ICSDs which maintain an unusually high number of links (Euroclear Bank, Clearstream Banking Luxembourg), EU CSDs have on average 8.5 links.

The majority of CSD links are direct links whereby the CSD is a direct participant in another CSD. Indirect links (via a sub-custodian) and relayed links (via a middle CSD) each account for around 1/4 of the total number of links respectively.

Around 2/3 of CSD links allow for settlement on a delivery versus payment basis, meaning that not only securities but also cash transfers are possible through the link. The vast majority of links allow for the transfer of both equities and debt instruments.

Half of CSD links are used on a daily basis by market participants. 41% of the remaining links are used infrequently (e.g. on a weekly or monthly basis), and 9% have been established but are not currently used.

Some statistics on the cross-CSD deliveries can be found below in Table F.

Table F: Share of internal and cross-CSD delivery instructions processed by CSDs in the EU (2015)

Share of internal and cross-CSD delivery instructions processed by CSDs in the EU (2015)

	Internal transfers (no CSD link account involved)		Internal transfers (at least one CSD link account involved)		External transfers, placing securities in another CSD	
	Value of deliveries (% of total)	Number of deliveries (% of total)	Value of deliveries (% of total)	Number of deliveries (% of total)	Value of deliveries (% of total)	Number of deliveries (% of total)
Eurozone	93.3	96.4	4.7	3.0	2.0	0.6
ICSDs	79.2	75.1	7.0	9.2	13.8	15.7
non-Eurozone	99.6	99.6	0.3	0.2	0.1	0.2
Total (EU)	88.5	91.2	4.6	4.0	7.0	4.8

Source: Calculations based on securities settlement statistics collected by ECB (ex-Blue Book data).

Notes: 1. Eurozone data includes data for the current members of the Eurozone.

2. Data for Croatia is not included.

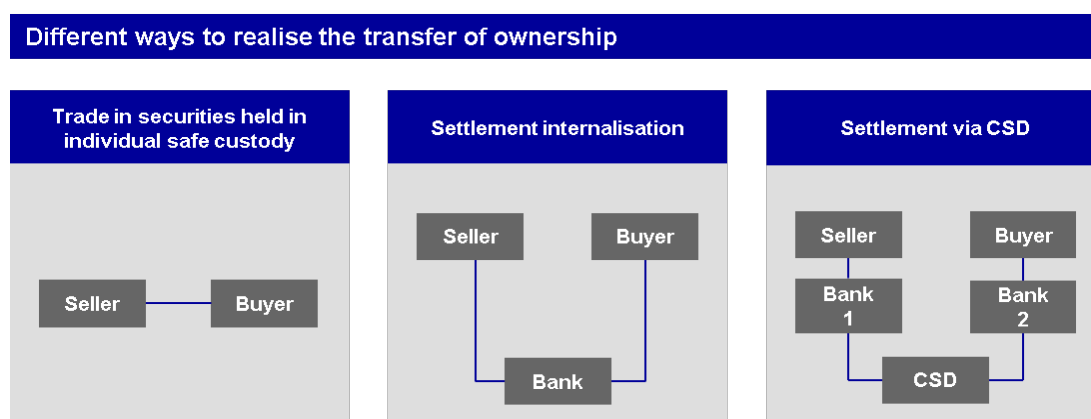
3.5.2.3. CSD Participants / Custodians / Global Custodians

Investors normally use banks to hold their securities and cash through safekeeping accounts and cash accounts. In this sense, banks are called ‘custodians’ of the investors’ assets and, in turn, banks hold their clients’ assets in centralised custody via the CSDs established in their country.

Settlement of a securities trade requires an arrangement between the seller’s and the buyer’s custodians to transfer the required quantity of securities from the seller’s safekeeping account to that of the buyer. At the same time, in DvP mode, the negotiated amount of cash moves in the opposite direction, from the buyer’s to the seller’s cash account. If both seller and buyer hold their assets in deposit at the same bank who in turn holds the security in the same omnibus account at the CSD, settlement can be effected efficiently, directly on the books of the bank (‘internalised settlement’). Under the CSDR (Art. 9), settlement internalisers will be required to report the aggregated volume and value of all securities transactions that they settle outside securities settlement systems. However, in the more frequent cases where different custodians or segregated accounts at the level of the CSD are involved in the settlement, the banks of the two trading counterparties need to coordinate between themselves the two simultaneous and reciprocal transfers of securities and cash, as per the terms that have been agreed in the trade⁵⁸.

In practical terms, when considering only the perspective of settlement activities, the distinction between custodians and settlement agents is not really significant, as both types of providers are effectively performing the same type of activities for the securities settlement instructions that they process on behalf of their clients. The different terminology refers to the broader role performed by these agents: in the case of “settlement agents” the focus is purely on the settlement activities, while for the “custodian” the focus is on the custody/safekeeping of the assets and on the provision of not only settlement services, but also other services related to the administration of the assets held in custody (such as income collections, corporate actions processing, withholding tax reclaims, proxy voting services, etc.). In some cases, the provision of pure ‘settlement’ service may also be completely separated from the ‘custody’ and administration service and in fact may be provided by two different agents (the term of “account operator” is often used to refer to an agent that provides settlement services on assets that are deposited in accounts provided by a third party).

Figure 11: Different models for effecting the transfer of assets



Source: EPTF.

Ultimately only a securities settlement system (SSS) provides final settlement in the sense that, if designated by a Member State under the SFD, it grants protection to its participants against

⁵⁸ Post Trade explained, The role of post-trade in the financial sector, AFME, 2015

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insolvency proceedings of other participants once a transfer order enters the system ('Settlement Finality I'), ensures the irrevocability of such a transfer order ('Settlement Finality II') and provides for the moment of the irrevocability of transfers ('Settlement Finality III'). This is of relevant importance as in the books of custodians settlement takes place cash against securities within the same institution therefore payment and delivery instructions could be put on hold by the custodian bank even before the opening of proceedings.

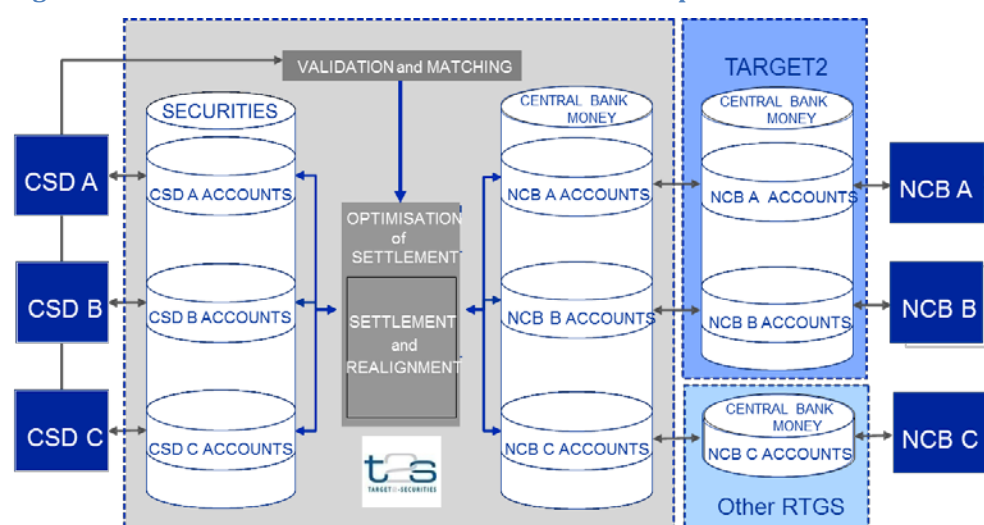
3.5.2.4. TARGET2-Securities (T2S)

Following the support received from almost all euro area CSDs as well as from the European Parliament and Council, the Governing Council of the ECB launched the TARGET2-Securities (T2S) project in July 2008. The goal was to integrate and harmonise Europe's settlement landscape. This would be achieved by means of a single platform for settlement in central bank money.

On 22 June 2015, T2S went live after seven years of preparation. By September 2016 12 CSDs⁵⁹ had migrated to T2S covering 11 European markets. T2S processes about 45% of the total transaction volume expected after the end of full migration in 2017. Two more migration waves are planned by September 2017. T2S will then cover a total of 21 European countries and settle almost 100% of securities transactions in euro central bank money (CeBM). As of 2018, T2S will also process transactions in Danish kroner, and further currencies and markets may join in future rollout phases.

The implementation of T2S was admittedly a complex and lengthy process, but its concept is relatively simple: by integrating on a single platform all securities and cash accounts of the participating CSDs and central banks (Figure 2), allowing for simultaneous delivery-versus-payment (DvP) settlement in CeBM. Regulators and participants of securities settlement systems agree that central bank money (CeBM) is a risk-free settlement asset and DvP settlement as the safest method. As a consequence, the final settlement ("delivery") of the securities depends on that of the corresponding payment in CeBM. In addition, in T2S the settlement of the cash leg and the securities leg occur simultaneously.

Figure 12: T2S: all securities and cash accounts on one platform



Source: ECB T2S documentation.

⁵⁹ Bank of Greece Securities Settlement System (BOGS), Depozitarul Central (Romania), Malta Stock Exchange, Monte Titoli (Italy), SIX SIS (Switzerland), Interbolsa (Portugal), National Bank of Belgium Securities Settlement Systems (NBB-SSS), Euroclear Belgium, Euroclear France, Euroclear Nederland, VP Lux (Luxembourg), VP Securities (Denmark).

The integration of all securities accounts and cash accounts on a single technical platform has two major benefits. On the one hand, it allows for intra- and inter-CSD settlement; so, in the example of Figure 1, settlement can take place between two participants of CSD A as well as between a participant of CSD A and a participant of CSD B or C. On the other hand, it creates a single pool of securities and collateral. This is an advantage for intermediaries, which hold securities with several CSDs across Europe and, thanks to T2S, can now move securities more easily between their CSDs or even concentrate them in a single location.

T2S settles debt securities, equities and other securities, and applies harmonised conditions and equal prices to domestic and cross-border transactions. By pooling together settlement volumes across Europe, T2S can achieve economies of scale and sharply cut the cost of securities transactions across borders. It also reduces banks' back office costs by centralising settlement and streamlining interfaces, and facilitates, via the single pool, collateral and liquidity management.

T2S also allows for collateral and liquidity savings through the so called "technical netting" of long and short positions and via its auto-collateralisation functionality, which creates extra liquidity for settlement via auto-collateralisation on flow and on stock⁶⁰. If resources are limited, partial settlement is also possible, which, together with the optimisation algorithms, leads to higher settlement ratios.

While CSDs and banks profit directly from these state-of-the-art features, T2S also brings benefits for financial markets as a whole: settlement risk is reduced, which has a positive effect on financial stability; issuers can broaden their investor base and investors their portfolios; and the access to European securities for foreign investors is made easier.

3.5.2.4.1. Impact of T2S

T2S is a critical infrastructure, which enables a more integrated and efficient European securities market and affects not only the payment and settlement layers, but also the clearing and trading layers.

The main channel through which this impact is propagated is "harmonisation". In certain areas, harmonisation is a direct consequence of the introduction of T2S. Its design, for example, entails the use of a standard communication protocol and a common settlement timetable across all T2S markets. T2S alone removes six out of the 15 barriers to cross-border clearing and settlement identified in the Giovannini reports of 2001-03⁶¹. Further harmonisation is achieved as a consequence of the T2S system specifications, standards and market practices. The settlement finality rules and the standards for corporate actions and cross-CSD settlement are examples in this respect. Another example is the adoption in October 2014 of "T+2" as the new European settlement cycle leveraging a paperless, dematerialised securities market. "T+2" has been enshrined in the CSD Regulation, which entered into force in September 2014 and is also closely linked to harmonisation activities that support T2S' objectives⁶². The T2S Advisory Group (AG) steers and monitors these activities and has published six T2S Harmonisation Progress Reports since 2011. The reports bear witness to the achievements in this field and the far-reaching impact of T2S on the processes along the whole securities chain (see section on market practices for further information).

⁶⁰ Auto-collateralisation is a credit operation that is triggered when a buyer lacks sufficient funds to settle a transaction. The credit provided can be secured using either the very same securities that are being bought ("auto-collateralisation on flow") or securities already held by the buyer ("auto-collateralisation on stock").

⁶¹ The Giovannini Group was a group of financial market experts formed in 1996 to identify inefficiencies in EU financial markets and to propose practical solutions to improve market integration. For the Group's two reports, see http://ec.europa.eu/finance/financialmarkets/clearing/communication/index_en.htm

⁶² See for example, Articles 30(5) on outsourcing and 48(8) on CSD links.

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Competition is another important channel through which the impact of T2S unfolds. Together with increasing regulatory requirements and customer needs, T2S changes the competitive landscape in Europe. It increases the competitive pressure on post-trade service providers and breaks the structures along national lines, which is not only another benefit, but also one of the original motivations behind T2S. The expectation is that the increased competition will result in tangible reductions in settlement costs, which – if sufficiently monitored and regulated – will in turn lead to cost reductions for end-investors and real-economy firms.

Equally it should be noted that the fact that EU legislation in post-trade is largely institutional (MIFID regulated trading venues, EMIR regulates CCPs and TRs, CSDR regulates CSDs...) and not functional also has implications in terms of competition and level playing field.

3.5.3. Market Practices

3.5.3.1. Types and Concepts of Settlement

Today, Settlement is commonly executed in book-entry mode because the vast majority of securities in Europe are either immobilised in a designated location (e.g. a centralised vault) or dematerialised. In both cases, they are transferred by account movements. Following their deposit in the vault, immobilised securities are represented in a book-entry form on the accounting records of a CSD and can then be transferred through the same book-entry process as for dematerialised securities. As the handling of physical securities is less and less common, the below chapter will therefore not cover the settlement process of physical securities.

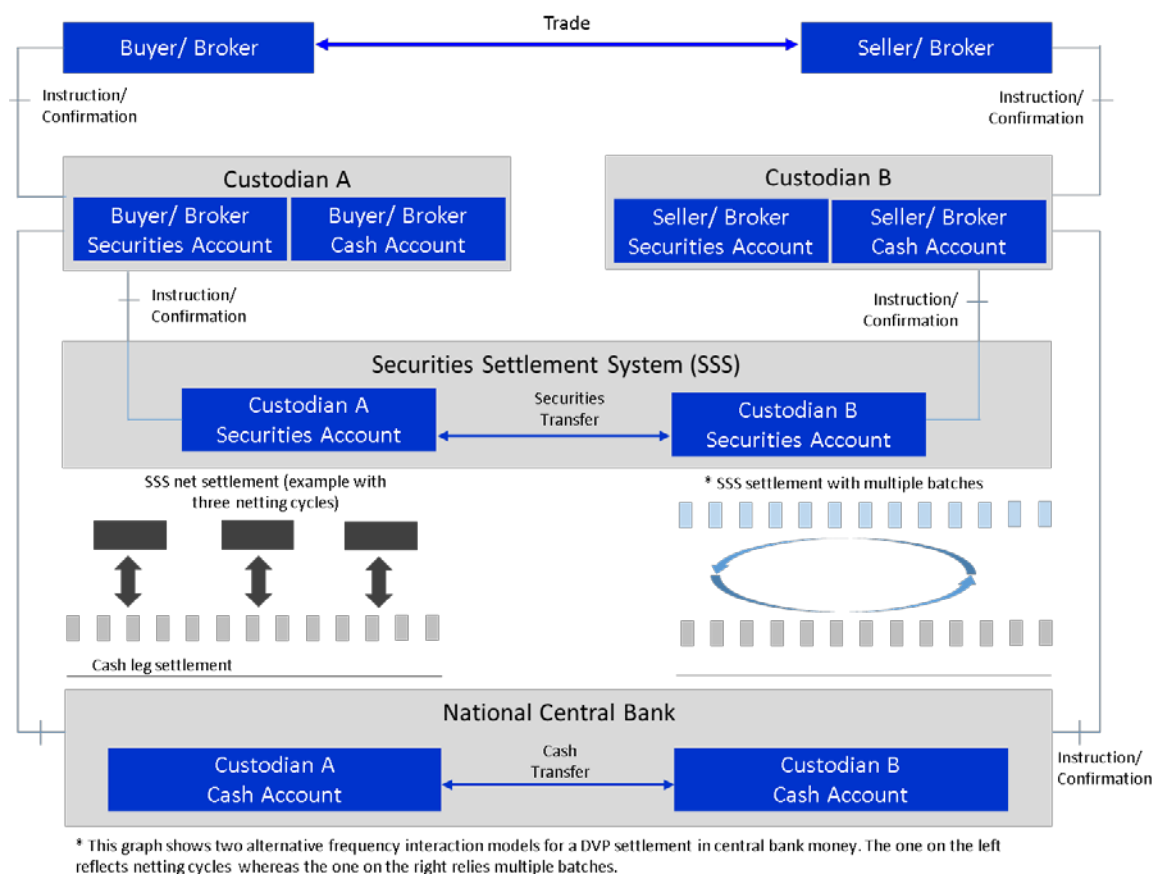
It should be noted that settlement of physical securities used to be performed amongst custodians through the CSD clearing process. However, physical settlements are currently very rare thanks to the immobilisation and dematerialization practices that already exist in most European markets and will be completely abandoned by 2025 in accordance with Article 3 of CSDR.

3.5.3.1.1. The DVP settlement

DVP implies a link between a securities transfer system and a cash transfer system that ensures that delivery occurs if, and only if, payment occurs and is therefore considered to mitigate counterparty risk.

DVP usually takes the general form of a basic three-step process: First, the Securities Settlement System blocks the underlying securities in the account of the seller, and then requests a transfer of funds from the buyer's bank to the seller's bank in the Payment System (PS). Finally, it delivers the securities to the buyer if (and only if) a confirmation of settlement of the cash leg from the settlement bank, or the Payment System, is received.

Figure 13: The DvP process



Source: EPTF.

The Committee on Payments and Market Infrastructures CPMI⁶³ report of the G-10 Central Banks, "Delivery Versus Payment in Securities Settlement Systems," published in 1992, identifies three approaches applied by SSSs to achieving DVP:

- DVP model 1 is a system that settles transfers of both securities and funds on a gross (or obligation-by-obligation) basis. The final (irrevocable and unconditional) transfer of securities from the seller to the buyer occurs at the same time as the final transfer of funds from the buyer to the seller. The advantage is that transfers become final as they occur. That reduces exposures among users during the settlement day.
- DVP model 2, are systems that settle securities transfer obligations on a gross basis. The final transfer of securities from the seller to the buyer occurs throughout the processing cycle, but settles fund transfer obligations on a net basis. At the end of the processing cycle, the final transfer of funds from the buyer to the seller occurs. The advantage is that less cash liquidity is required as a result of the netting among users.
- DVP model 3 is a system that settles transfer obligations for both securities and funds on a net basis. Final transfers of both securities and funds occur at the end of the processing cycle. The advantage is a reduction in the required cash and securities liquidity in contrast to model 1 and 2.

⁶³ <http://www.bis.org/cpmi/publ/d06.pdf>

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Table G: The models used by non-central bank CSDs in the EEA as of 1 July 2016

Model 1	Model 2	Model 3
<p>ATHEXCSD (Greece): for transactions at beneficiary owner level</p> <p>CDCP SR (Slovakia): for OTC transactions</p> <p>Clearstreal Banking Luxembourg</p> <p>Clearstream Banking Frankfurt</p> <p>CSDL (Lithuania): for OTC transactions</p> <p>Cyprus Stock Exchange: for OTC transactions</p> <p>Depozitarul Central (Romania): for OTC transactions</p> <p>Estonian CSD</p> <p>Euroclear Bank</p> <p>Euroclear Belgium</p> <p>Euroclear Finland</p> <p>Euroclear France</p> <p>Euroclear Nederland</p> <p>Euroclear Sweden</p> <p>Euroclear UK & Ireland: for EUR and GBP transactions</p> <p>Iberclear (Spain): CADE platform</p> <p>Interbolsa (Portugal)</p> <p>KDD (Slovenia): for OTC transactions</p> <p>KDPW (Poland): for intraday transactions</p> <p>KELER (Hungary): for OTC transactions</p> <p>LCD (Latvia): for OTC transactions</p> <p>LuxCSD</p> <p>Malta Stock Exchange</p> <p>Monte Titoli (Italy)</p> <p>OeKB CSD (Austria): for OTC transactions</p> <p>SKDD (Croatia): “trade-for-trade” service</p> <p>VP (Denmark): possible during the opening hours of the Danish central bank</p>	<p>ATHEXCSD (Greece): for wholesale transactions</p> <p>CDAD (Bulgaria)</p> <p>CDCP SR (Slovakia): for Exchange transactions*</p> <p>CSD Prague</p> <p>CSDL (Lithuania): for Exchange transactions*</p> <p>Cyprus Stock Exchange: for Exchange transactions,</p> <p>Depozitarul Central (Romania): for Exchange transactions</p> <p>Euroclear UK & Ireland: for USD transactions</p> <p>KDD (Slovenia): for Exchange transactions*</p> <p>KDPW (Poland): for batch transactions</p> <p>Nasdaq CSD Iceland</p> <p>VPS (Norway)</p>	<p>KELER (Hungary): for Exchange transactions*</p> <p>LCD (Latvia): for Exchange transactions*</p> <p>OeKB CSD (Austria): for Exchange transactions*</p> <p>SKDD (Croatia): contractual service</p> <p>VP (Denmark): default model*</p>

* CSDs marked with a star sign will switch to Model 1 after their migration to T2S.

Source: ECSDA online database.

Within the DVP process two qualities of cash or money can be used. Firstly, there is central bank money (CeBM), or money which is considered a liability of a central bank. Settlement in central bank money typically calls for the discharge of settlement obligations on the books of a central bank. Secondly, there is commercial bank money (CoBM), or money which is considered a commercial bank liability, and is represented by the deposits held at the bank. CoBM settlement carries a risk: settlement funds may not be available in the event of the insolvency of the commercial bank that is providing the settlement services. This risk is a function of the financial health of the commercial bank at stake.

3.5.3.1.2. The FoP Settlement

The use of FoP settlement function depends on the underlying arrangements of the underlying counterparties and the type of transaction conducted.

This process in principle can be compared with a DVP settlement, where the securities transfer is effected without a corresponding transfer of funds. Two linked, free of payment instructions, can be referred to as “delivery-versus-delivery.”

Examples for FoP transactions could be portfolio transfers or the processing of a corporate action or a securities lending transaction.

3.5.3.1.3. Settlement Finality

Settlement transactions become final, following the completion of all the steps required under one of the above DVP models and in accordance with the provisions of Settlement Finality Directive and the CSDR. However in some situations it may be useful to understand the status of a transaction before it was finally settled. This is very important in the context of insolvency, where certain transactions may be protected by the settlement finality regime while others are not.

When considering “settlement finality” one should keep in mind the distinction between the finality concepts applicable to “transfer orders” (or settlement instructions) and those applicable to actual “transfers” (or bookings in securities and cash accounts). The Settlement Finality Directive (SFD) concerns the “moment of entry” and the “moment of irrevocability” of a transfer order not of the actual transfer of assets (i.e. securities and cash).

To this extent, CSDs are required by the CSDR and local law to define in their systems three distinct definitions of settlement finality, based on the EU legislation:

- Settlement Finality I: is the moment of entry of a transfer order into the system. If reached before the opening of insolvency proceedings, it means that the transfer order is protected against insolvency procedures. This moment is specified in the rules of the system
- Settlement Finality II: is the moment after which a transfer order cannot be revoked – neither by a participant of the system nor by a third party. This moment is specified in the rules of the system.

Settlement Finality III: is the moment of when transfer orders (bookings in securities and cash accounts) are enforceable and binding on third parties, even in case of opening of an insolvency proceeding. According to Article 39(3) CSDR, CSDs are obliged to disclose the moment of irrevocability of transfer in their rules. SF III is, therefore, determined by the national law or the CSD rules.

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These three definitions are fully adopted in the design of the T2S operational processes⁶⁴, whereby the three moments SFI, SFII, and SFIII, have been harmonised as follows:

- SFI (moment of entry): is achieved at the validation on the settlement instruction on the T2S platform;
- SFII (irrevocability): is achieved at the matching of the instruction on the T2S platform;
- SFIII (finality of transfer): (i) – in relation to the cash transfer – at the moment in which cash account is credited and (ii) – in relation to the securities transfer - when the securities account is credited /debited.

The potential revision of the SFD and the respective insolvency laws in order to take into account, among other things, these definitions would enhance legal clarity in the EU regarding the concept of settlement finality⁶⁵.

One should also bear in mind that SFD applies only to operators of Securities Settlement Systems, mainly CSDs and CCPs and not to custodians in the chain of intermediaries. In order to establish an equal treatment of all stakeholders in the chain across the EU markets the potential revision of the SFD should also take this point into account.

3.5.3.1.4. Credit control and insolvency procedures of CSDs in the event of a participant default

With regards to insolvency the processes for handling the default of a CSD participant vary from market to market and from CSD to CSD depending on a combination of national insolvency laws, practices and CSD rules. CSDR requires CSDs to have transparent processes for handling the default of a participant. Generally, each CSD is responsible for maintaining procedures that are scrutinized by securities market regulators on a periodic basis. Under the CSDR, the default of a participant is defined as a situation where insolvency proceedings as defined in point (j) of Article 2 of Directive 98/26/EC (...) are opened against a participant. ESMA is currently working on drafting Guidelines in order to achieve a harmonized handling of participant default procedures, for which the market has been consulted⁶⁶.

At the current stage different approaches exist how to handle the insolvency of a market participant in Europe and hence CSDs in one market may utilize other tools than CSDs in another market. The same applies for the recognition of indirect participants by the CSD which has been a voluntary element of the Settlement Finality Directive⁶⁷ implementation e.g. in some markets, insolvency procedures of the CSD also apply to indirect participants whereby other European markets only look at the direct account holder.

Many CSDs settle their transactions in central bank money and are exposed to commercial bank credit risk. Those who offer settlement in commercial bank money have a banking license and are required to meet regulatory requirements from their respective regulators. Under CSDR the requirements have become more stringent and all credit lines have to be fully collateralised and fit the economic profile of the CSD.

⁶⁴European Central Bank. Harmonisation. Available at:

<https://www.ecb.europa.eu/paym/t2s/harmonisation/activities/html/index.en.html>

⁶⁵ The 21 European markets, covering 24 CSDs, are already in the process of signing a collective agreement regarding the three different notions of Settlement Finality in the context of the T2S operations.

⁶⁶ <https://www.esma.europa.eu/press-news/consultations/guidelines-participant-default-rules-and-procedures-under-csdr>

⁶⁷ The Directive 2009/44/EC of 6 May 2009 amending Directive 98/26/EC on settlement finality in payment and securities settlement systems and Directive 2002/47/EC on financial collateral arrangements as regards linked systems and credit claims.

Credit control and insolvency procedures of banks (From a practical point of view banks initiate several actions when a counterparty becomes insolvent or is being restructured in order to avoid that assets flow to the insolvent participant without receiving the respective compensations:

- unmatched instructions are cancelled (as are usually the underlying trades)
- matched transactions are set on hold until there is clarity that those transactions will remain intact and will be settled
- counterparties may employ different modes of settlement – „safe settlement“ whereby the defaulting party needs to pay first before assets are being released
- trading parties will usually initiate the cancellation clauses in Repo/ SecLending transactions for close-out and liquidation of collateral

The above is only an indicative list of activities being performed in an insolvency situation. Given that insolvency laws in Europe are not harmonized and the Bank Recovery & Resolution Directive (BRRD)⁶⁸ leaves room for interpretation and implementation these may remain treated differently in different countries. For example, there is currently no harmonisation of rules within EU markets about the processes of holding, recycling or cancellation of pending instructions (transfer orders) for the account of the defaulting participant. Another complicating factor could be the difference in insolvency procedures envisaged in the local law where the settlement system is located and the insolvency procedures of the country in which the underlying transaction has been executed or where the two trading parties are located.

Within the T2S perimeter, in order to avoid the potential uncertainty arising from possible differences in timings for default declarations across different CSDs, the T2S Ad-hoc Task Force on Insolvency Procedures (established under the T2S CSG in 2014) agreed on a common procedure to share information via the T2S structure (including both common technical and operational arrangements as well as a single governance/escalation process for all connected CSDs). Although review is ongoing, this TF also recommended “to consider the notification received from a CSD/NCB through T2S as reliable notification”, so that all participating CSDs could rely on the decision of one single court/resolution authority in one of the T2S participating markets, without the need to wait for additional decisions in each market, which would very likely become available at different successive times. Additional work would be required to establish harmonised procedures for the so called "indirect participants", i.e. a client of a custodian which is expressly identified by the CSD (in general, a segregated client), in order to provide certainty of operational procedures and to reduce systemic risks by safeguarding the business of custodians/settlement agents in case one of their clients goes in default, without impacting the other clients of the same custodian/settlement agent.

3.5.3.2. Account structures

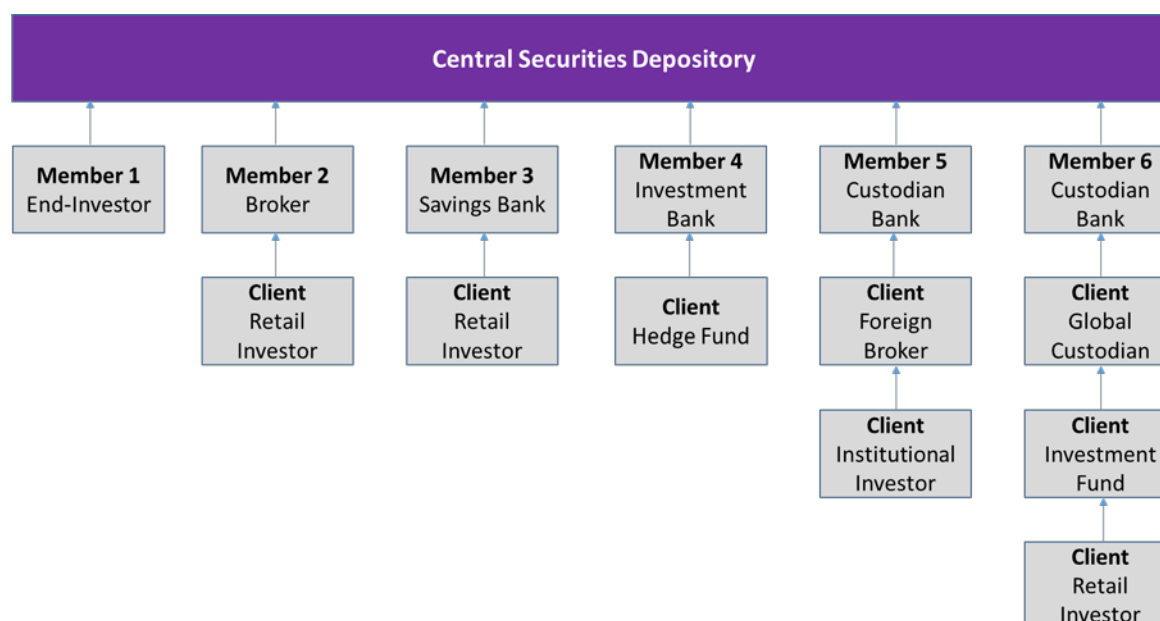
By choosing to hold their securities via a custodian bank, market participants are taking a significant step: they are choosing to outsource asset servicing activities to an entity that can complete these tasks better, more efficiently -- and potentially cheaper -- than the market participants themselves are able to do. Moreover, this decision on whether or not to keep asset servicing activities “in-house” results in multi-tiered intermediation in securities custody chains.

⁶⁸ Directive 2014/59/EU of the European Parliament and of the Council of 15 May 2014 establishing a framework for the recovery and resolution of credit institutions and investment firms.

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Figure 14: Examples of multi-tiered intermediation in securities custody



Source: EPTF.

All financial institutions providing securities accounts to clients are subject to specific rules on account segregation particularly with regard to the segregation of proprietary and customer assets through a given custody chain. In recent years, several new rules have been adopted, especially at EU level, to determine the cases where securities accounts of clients must be maintained separately from the accounts of other clients. This should ensure that client assets are protected in the case of the insolvency of the financial market intermediary (Custodian / Global Custodian). Segregation can take different forms, and it can occur at different levels, e.g. at financial intermediaries or at the level of financial market infrastructures like CCPs and CSDs.

In each tier, a choice is made on the account structure – whether to hold the fungible assets of different clients together without separating out ownership (Omnibus account), or to hold the assets of individual clients in individual segregated accounts.

Custody account structures

Book-entry securities typically are held through a chain of custody either through omnibus account structures or segregated account structures. A key unifying principle is that all securities accounts should be expected to “segregate” holdings for customers. In this sense, all custody account structures are “segregated” since an account holder relies on the books and records of its account provider to identify his or her securities.

Asset segregation therefore is typically achieved by account segregation. “Accounts” in this context can mean one of two things from the perspective of a securities account provider: (a) “internal” accounts, i.e., accounts opened as ledger items on the books of the securities account provider and (b) “external” accounts, i.e. accounts opened by the securities account provider to hold their securities account holders’ assets with third party custodians, CSDs or CCPs. Both types of accounts lead to a segregation of assets.

To provide investor protection, it is not sufficient for an intermediary (A) to keep clear records itself as to what belongs to clients and what belongs to itself. This is necessary, but it is not in itself

sufficient to achieve segregation. What is also needed is separate records at the next level (B) in the chain of intermediaries which identify the assets as belonging to (B)'s clients and not (B) itself.

“Omnibus” accounts refer to the account maintained for A by B: the account is “omnibus” only in the sense that the account is held by B for multiple underlying customers of A instead of each customer of A separately. In any case it should be noted that the legal basis and the level of protection is the same irrespective of the account type chosen, in other words securities law at the national domestic level does not make a distinction between segregated and omnibus in terms of the rights of an investor. Equally compliance checks apply at each level of the custody chain as well as the obligation to complete a “Know-Your-Client” (KYC) and “Know-Your-Client’s-Client” (KYCC) process, regardless of the chosen account type.

The decision on the account type chosen will have different triggers. While efficiency considerations may be the driver to open an omnibus account, the reasons to choose segregated accounts may rather be legal requirements. Higher levels of pooling in fewer segregated accounts can create an environment that permits the delivery of critical liquidity products such as tri-party repo, securities borrowing and lending, deliver significant economies of scale by netting of settlement transactions and the aggregate processing of corporate actions. The importance of the economic efficiency of non-segregated account types is demonstrated by the continued high levels of omnibus account structures around the world. This is especially the case for larger, more sophisticated markets like the US, Germany and the UK. In addition, the availability of omnibus accounts is a T2S harmonisation standard⁶⁹.

However, it has to be noted that there are many different holding patterns in the EU for securities⁷⁰. In the Nordic countries (Denmark, Finland, Norway and Sweden), most (and all listed) securities are dematerialised with a CSD. On a very general level, the Nordic securities holding systems can be categorised as a mixed system with both direct holdings and indirect holdings through nominee accounts. The Nordic holding structure is however based on the direct holding model, in which both institutional and retail investors have the right and possibility to have securities accounts on the CSD level. Each of the Nordic holding systems has developed separately and is founded on special national legislation. By law the main principle for the Nordic holding system is that the owner of a dematerialised security has the right to be registered as the owner of securities in the account with the CSD (the owner account). Owner registration gives the account holder a legitimate capacity as owner.

Nordic holding systems also allow investors to choose to hold their securities in omnibus (nominee accounts) accounts. The use of nominee accounts varies between the different Nordic countries.

Custody Chain contains of multiple layer with several involved parties⁷¹

The custody chain typically starts in every case at the level of the entity performing the notary function of a given financial instrument. This could be a registrar but in many cases it is also the

⁶⁹ The T2S standard requests the “availability” of omnibus accounts at CSD level, in order to ensure interoperability and efficient cross-CSD settlement, but it does not impose any wider account structure rules on CSDs or their participants.

⁷⁰ See Dr Philipp Paechs presentation for the European Parliament’s workshop on Securities Law Directive Securities Law Directive (SLD) What’s in a securities account? IP/A/ECON/NT/2011-10. Those differences are also recognized in international documents like the Hague Convention and the Geneva Securities Convention as well as in the Second Advice of the Legal Certainty Group. See also Lars Afrell and Karin Wallin-Norman in Uniform Law Review NS-vol X 2005-1/2

⁷¹ ISSA- Transparency in Securities Transactions and Custody Chains (<http://www.swiftinstitute.org/wp-content/uploads/2015/09/2015-08-ISSA-Transparency-in-Custody-Chains.pdf>).

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CSD, which in addition maintains securities account at the highest level and operates a dedicated securities settlement system, which ensures that securities can be transferred in a book-entry method.

At this level CSD Participants have opened accounts at the CSD depending on the market and the subsequent legal requirements in addition to the account structure requested by their clients. As per the ECSDA Report from 2015⁷² a number of different account models exist in Europe today:

- Omnibus markets;
- Hybrid markets with individual client segregation;
- Hybrid markets with end-investor segregation;
- Segregated markets on end-investor level.

Table H: Overview of Account Structures per European Market

Omnibus markets	11 countries (12 CSDs): AT, BE, DE, FR, HU, IT, LT, LV, NL, PL, PT
Hybrid markets with individual client segregation	2 countries (4 CSDs): ES, LU
Hybrid markets with end-investor segregation	9 countries (9 CSDs): CY, CZ, DK, EE, IS, RO, SE, SK, UK
Segregated markets on end-investor level	7 countries (7 CSDs): BG, FI, GR, HR, MT, NO, SI

Source: ECSDA report on Account Segregation Practises of European CSDs, 2015.

CSD participants usually also have underlying clients for which they provide custody services the account structures are replicated at the level of the CSD participants and their respective clients down to the ultimate final beneficiary. Every party in the chain identifies in its books and records the immediate account holder for whom the account has been opened. Additionally, if required or requested by the client, an underlying beneficiary can be mentioned in the account description field⁷³.

From the other end of the chain investors usually would appoint a financial institution for the safekeeping of their securities at a CSD level. Depending on their investment scope, investors may appoint a global custodian / funds depository, which is able to offer a custody service on a global basis. For some investors this appointment is mandated by law (UCITS /AIFMD etc.). The global custodian / funds depository then typically appoints a party in the required markets, which establishes the connection to the CSD infrastructure. CSDR establishes the rule that all authorised CSDs should offer their participants the choice between omnibus account segregation and individual account segregation .

The 2015 ECSDA report outlines that:

- There is a multiplicity of segregation models used for domestic settlement across Europe. In addition, within each grouping, the practicalities of account segregation can vary (e.g. whether subaccounts or separate accounts are used), as well as market participant preferences (in hybrid markets in particular, segregated accounts may be seldom or very frequently used). A consistent terminology and a better understanding of existing practices

⁷² http://ecsd.eu/wp-content/uploads/2015_10_13_ECSDA_Segregation_Report.pdf

⁷³ As enshrined in Art 38 (4),(5) of CSDR.

and challenges at CSD level is necessary before a more detailed analysis is undertaken on the pros and cons of different segregation models.

- The right level of segregation cannot be reduced to a trade-off between safety and efficiency. In fact, in many cases, national law appears to be a much more determining factor than CSD account segregation practices in terms of investor protection and issuer transparency. Most CSDs which took part in the ECSDA survey indicated that there was no difference in terms of investor protection between omnibus and segregated accounts. In other words, investor rights seem more dependent on the national legal framework than on the type of account used in the CSD.
- Individual client or end investor account segregation typically does not apply in cross-border scenarios. CSD links operate on the basis of omnibus accounts in order to avoid complex and inefficient procedures for cross-border settlement. Even in markets which require significant segregation by domestic participants (up to the level of end investors), omnibus accounts are allowed and recognised as necessary to allow non-domestic CSDs to access the local market efficiently. This is especially true for CSDs participating in the Eurosystem TARGET2-Securities (T2S) project⁷⁴.
- There is a complex and sometimes inconsistent interaction between different pieces of EU law as regards segregation rules for securities accounts. The risks stemming from this situation are subject to ongoing market discussion.
- Although regulatory complexity creates uncertainty on the combined impact of existing and future account segregation rules, the notion of "investor choice" introduced by the CSD Regulation (2014) could in the medium term result in a progressive convergence of existing practices at CSDs, with segregated and omnibus accounts being offered as a choice and may therefore have an impact further down the custody chain (CSD participants).

3.5.3.3. The settlement process

3.5.3.3.1. Transmission of settlement instructions⁷⁵

In order for CSDs to process settlement transactions they need to receive those on a standardized way from their participants. As of today the use of ISO standards in the CSD/Participant communication is widespread, whereby it is assumed that in future the ISO 20022 will become the new standard for market infrastructure communication. T2S to that extent has consequently been built to this new standard.

At the same time some CSDs also use some proprietary information transmission tools that have developed historically and which market participants have adopted. Moreover, CSDs offer Graphic User Interfaces (GUI) which are connected to their respective settlement infrastructure to minimize the manual efforts required for the settlement processing. The more transactions are transmitted in electronic STP format, the better. CSDs have specific checks implemented when a given transaction is received from a CSD participant, these shall ensure that the instruction indeed meets all requirements for STP processing.

⁷⁴ Cross-CSD settlement in T2S is possible via any account segregation model (via CSD link arrangements). However, CSD links based on omnibus accounts are more efficient than CSD links requiring additional segregation rules.

⁷⁵ These issues are mostly relevant for non-T2S markets/market infrastructures. These issues are harmonised, at large, in T2S. Of course, market participants with no direct technical access to T2S, may still use some national standards. However, the overall trend for the 21 T2S markets is to converge to the T2S harmonisation standards.

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CSD participants offer their clients similar choices as CSD to provide them with the respective instruction. To some extent instructions are even transmitted through other means than electronic messaging, however this is only exceptional and subject to significant risk mitigation procedures due to the high risks involved in the use of fax or email as instruction transmission medium.

Given the different transactions that are being settled at a CSD, different settlement messages have been developed. The main messages used today are for transactions free of payment (DF / RF), transactions against payment (DVP/RVP) and specific messages for Collateral management (DBV / Triparty instructions)

CSDR and T2S encourage market participants to submit their transactions as early as possible in the settlement cycle.

3.5.3.3.2. Settlement Matching

The process of "matching" can be defined as the comparison of settlement details by two counterparts to a transaction, following the execution of a trade, in order to ensure that they meet the terms of the intended transaction. Providing an efficient matching framework is a critical step to mitigate liquidity and operational risk as it reduces the occurrence of failed transactions and may complement "provisioning" checks and controls at the level of the CSD.

The matching process is normally executed automatically by a matching engine within the settlement system of a CSD.

For on-exchange transactions, the process is usually automated. Instructions are entered into a trading system and sent for settlement in a given CSD or, transactions are first sent to a clearing house before being settled at the CSD. The process for these transactions and the inter-linkage between stock exchange-clearing house-CSD is usually assured by a secure, dedicated feed and established lifecycle which is overseen by securities market regulators. Market participants - usually the investor's custodians - are able to view their clearing and matching obligations via a dedicated connectivity tool. Matching may be considered (legally) "binding" or "non-binding" based on market regulations or market practices of the CSD. In some markets, e.g. in T2S markets, once two settlement instructions are matched on the T2S platform they will be attempted for settlement. Any further effort to cancel may be conducted only bilaterally, i.e. both counterparties cancelling their settlement instructions. In other markets unilateral cancellation may be possible.

For OTC transactions, the process is more complex and less structured. It requires bilateral input by CSD participants in the system of the CSD and will result in an unmatched transaction in the event the details entered by the market participants differ. Often input into the clearing or CSD system is via a proprietary interface that clearly provides the user with the status of the settlement transaction. This may be preceded by a pre-matching step, whereby the two instructing parties perform a validation of the settlement details (often on a manual basis) before sending their respective instructions to the settlement system. There are essentially two objectives of the pre-matching step: firstly, to verify the correctness of the trade details before issuing the delivery and receipt instructions, thus reducing the likelihood of discrepancies and the need for additional handling of the same instructions (instructions pre-matching); secondly, to reciprocally confirm with the counterparty (a sort of informal commitment) that the resources required for the completion of the transaction are indeed available on the delivering securities account and on the paying cash account respectively. In the case of settlement agents acting on behalf of their clients, this process also consists of a preliminary check of internal credit lines in addition to the control of available cash. With the increasingly widespread use of automated matching engines, the manual pre-matching process is no longer necessary, thereby operational resources can be more efficiently

dedicated to exception processing only, i.e. the resolution of problems on unmatched transactions (typically due to missing instructions or other operational errors). However, the internal position and credit checks continue to be performed by the two instructing parties, especially in case of agents acting on behalf of third parties.

The matching process can also be improved by employing "pre-matching" methods. These are often used to allow the institutions to have matching results without having the results being considered as "binding" for settlement, thereby reducing risk and increasing flexibility for settlement. This is either done manually, through telephone or fax, which can lead to operational errors, or through automated solutions such as pre-advise messages sent by CSDs and CSD participants to their respective clients or Hold and Release functionality. Global Custodians are especially inclined to use the Hold and Release functionality as it allows them to ensure that their customers, on an omnibus structure, receive matching results on their transactions before they are eligible for settlement. The transactions will only be released once the underlying customer will have covered their position. Nonetheless, for those transactions remaining unmatched at the CSD, which are advised by the CSD through allegation messages or status messages, manual procedures have been established by CSD participants to contact the respective counterparties of a given transaction and inquire the missing settlement instruction. Operations staff is then using telephone and other electronic means to agree on trade details to find out where the mismatch occurred. This procedure occurs more frequent closer to the settlement deadline with focus on important and large volume transactions.

Settlement efficiency is at the heart of many post-trade industry discussions and the first step to improve it, is to improve the matching process. In order to do so, various initiatives are being taken. For example, the CPMI and IOSCO recommend that the trade confirmation be sent on T+0 or at the latest T+1, this allows parties to correct the details of their transactions, in case of mistake, in time before the settlement date. In addition, there has been a trend in Europe that has started with T2S and the standardisation of matching fields for the vast majority of European CSDs. This trend will continue and will be enhanced with CSDR that will impose mandatory matching fields for all CSDs in Europe, harmonising the matching process. These measures have a clear impact on the matching efficiency by simplifying and standardising the rules.

Lastly, for the purpose of matching, a CSD have set matching tolerance levels to cater for small mismatches in settlement amounts that have been instructed by both counterparties to the transaction. This will also be standardised by CSDR.

Another initiative that improves the matching process is the implementation of the bilateral cancellation concept in many European CSDs. This bilateral cancellation process, that will soon become a standard in Europe under the CSDR, prevents matched transactions from being cancelled provided there is no bilateral agreement.

Where cross-border platforms exist, e.g. in T2S markets, once two settlement instructions are matched on the T2S platform they will be attempted for settlement. Any further effort to cancel may be conducted only bilaterally, i.e. both counterparties cancelling their settlement instructions. In other markets unilateral cancellation may be possible.

3.5.3.3.3. Settlement Cycle

Within Europe a harmonised settlement cycle of T+2 (i.e. settlement takes place on the second day after the trade date) has been established. This harmonised cycle was on one side achieved by the prescription of the CSDR Article 5(2), which has taken on-board the proposals made by an earlier Task Force of the European Commission's Clearing and Settlement Advisory and Monitoring Group

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II⁷⁶. On the other side the industry in a coordinated effort prepared for a consolidated move of the European landscape to T+2 ahead of the regulatory timescale and most EEA markets successfully transitioned to a T+2 cycle in October 2014, with the exception of Spain (for equities) which introduced the new cycle later in September 2016.

Furthermore, it should be noted that other large securities markets have endeavoured projects to reduce their settlement cycles such as the US⁷⁷ and Canada which will adopt the shortened settlement cycle in 2017. At the same time there are markets which have been using an even shorter settlement cycle of T+0 (i.e. same day settlement) previously and are now considering a move to the longer T+2 settlement cycle.

Japan shortened its settlement cycle for JGB from T+3 to T+2 in April 2012 (for domestic transactions only). Market participants and FMIs are currently considering shorting the JGB settlement cycle further to T+1 (for domestic transactions only). Another example is South Africa, which gradually changes its standard cycle from T+5 to T+3⁷⁸.

It has been perceived that a standard settlement cycle would be best aligned to the standard settlement cycle of foreign exchange transactions which most players will utilise to ensure that the required resources are available at the required time.

3.5.3.3.4. Settlement Completion

When a transaction is due for settlement, the CSD typically would checks that the securities to be delivered are available in the securities account of the delivering party. At the same time, it checks if sufficient cash is available at the cash account of the receiving party. If both checks are successful, the CSD finalizes the transaction by simultaneously transferring securities and cash to the respective party.

Each CSDs will use its own specifically developed algorithm based on the settlement model chosen (note: T2S CSDs use the T2S settlement algorithm). These algorithms are designed to achieve the optimum settlement results with the available resources. In order to further optimise the use of resources, CSDs offer additional functionality such as auto-collateralisation, securities borrowing and lending and secured credit lines. For a more detailed description please refer to the "Liquidity Tools" Section.

Other support functions in the settlement process are "hold&release" which typically are used by custodian banks to manage their exposures at client's activities.

Typically settlement processing starts already on the evening of the previous day and continues to the actual settlement day, whereby transactions versus cash usually are last settled at around 4 pm CET and free of payment transactions cut off is applied at 6 pm CET. During this time CSDs apply a variation of settlement runs which include batch runs but also real time gross settlement.

Moreover CSDs apply different settlement cycles or apply real time settlement throughout the day to ensure that received securities in one transaction could also be reused in another transaction.

T2S in this context has been acting as a strong harmoniser providing the same settlement cut off times for all participating CSDs. The same applies for Cross-CSD transactions in the T2S context,

⁷⁶http://ec.europa.eu/internal_market/financial-markets/docs/cesame2/presentations/20100408-update_barrier6_en.pdf

⁷⁷ <http://www.ust2.com/about-us/>

⁷⁸ <http://www.strate.co.za/blog/2016/08/settlement-history-being-made-with-t3/>

which previously had not been aligned and depended strongly on the set up of the CSD links. The efficiency of cross CSD settlement depends to on the level of automation that certain links provided and the frequency of the updates that the issuer CSD provided to the investor CSD.

T2S in this context has been acting as a strong harmoniser providing the same schedule of the settlement day (including opening, closing and cut off times) for all participating CSDs. The single operating schedule facilitates in particular the cross-CSD transactions in the T2S context, which previously had not been aligned and depended strongly on the set up of the CSD links.

Outside T2S, the efficiency of cross CSD settlement depends on the level of automation the credit arrangements, risk management and reconciliation procedures between the linked CSDs and the frequency of settlement “batches” between issuer CSD and investor CSD.

3.5.3.3.5. Settlement Internalisation

This process typically occurs when an institution⁷⁹ executes settlement business on behalf of clients and two of its clients have traded with each other. The subsequent settlement instruction would then have to be settled within the same CSD account if sent to the (I)CSD. Some CSDs today do not allow for the settlement in the same CSD account and would reject such instructions.

An alternative is for institutions that effect internalised settlement to check the availability of securities and cash in its own books and to effect the respective settlement. With the finalization of CSDR Level 2 requirements, a reporting requirement will be clarified which is aimed at providing an aggregated value and volume overview of internalised settlement in European Service provider.

Settlement Internalisation is only possible in markets which operate on an omnibus account set-up and do not mandate end-investor segregation.

While Settlement Internalisation can achieve a transfer of ownership rights, Settlement Finality as defined by SFD can only be achieved in a dedicated Securities Settlement System.

3.5.3.3.6. Fails management process

CSDs provide information to their participants on pending and failed instructions. In addition securities lending facilities exist in some CSDs, a service which can contribute to reduce the likelihood of fails.

When a participant fails to deliver securities (or cash) on the intended settlement date, the transaction cannot settle and, in some cases, daily penalties are imposed on the failing party until settlement is achieved. Today, only some CSDs in Europe already have implemented penalty regimes to incentivize better settlement efficiency. After the implementation of the CSDR regulatory technical standards, penalties will be applied by all EU CSDs on instructions that fail to settle, based on a harmonised calculation formula.

CSD participants on their end inform their clients about failed settlement instructions and offer resources to cure settlement fails.

For longer termed fails buy-in practices exist and have been agreed by the industry but are not extensively used. A buy-in means that a third party purchases the securities to enforce delivery

⁷⁹ CSDR Art. 2(11) (11) ‘settlement internaliser’ means any institution, including one authorised in accordance with Directive 2013/36/EU or with Directive 2014/65/EU, which executes transfer orders on behalf of clients or on its own account other than through a securities settlement system.

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after an instruction has failed. The original seller is then charged any difference in cost. With CSDR's Settlement Discipline Regime (Please see section 4.1 below) this will be harmonized across Europe.

In case of a settlement fail occurring on securities undergoing a corporate event, mechanisms of "market claims" or "transformations" are usually triggered in order to permit the real beneficial owner to benefit from the event proceeds. Please refer to the Asset Services section (3.6) for further details.

3.5.3.4. Portfolio transfers

Portfolio transfers occur when a client transfers his portfolio of securities from one custodian to another. Such transfers require the transmission of client information from the delivering custodian to the receiving custodian, but this information is currently not provided in a harmonised way.

A European Working Group on Portfolio Transfers (EWGPT) was set up by the European Banking Federation (EBF) in November 2014 to recommend basic principles and best market practices to exchange information needed in a securities portfolio transfer in T2S, when the transfer occurs across accounts held in different CSDs. This work is still under analysis by the T2S Harmonisation Steering Group.

3.5.4. Future Trends and Impacts

3.5.4.1. Increased monitoring of instructions

All stakeholders in the securities value chain are increasingly challenged to monitor settlement instructions that they receive to comply with increased obligations for oversight under market standards as well as regulatory requirements. This may include screening for individual settlement instructions as well as detecting settlement patterns of fraudulent transactions.

3.5.4.2. CSDR

The CSD Regulation aims to improve the securities settlement process in Europe and introduces a common authorisation, supervision and regulatory framework for CSDs.

Alongside the EMIR Regulation, MiFID 1 / MiFID II and MiFIR), the implementation of CSDR complements the regulatory framework for the transaction lifecycle.

It is assumed that following the entry into force of CSDR in September 2014, the European Commission will be adopting the remaining Regulatory Technical Standards (RTS) in 2017, which will outline the detailed requirements. Actual implementation of the standards is then expected to take place in the following years (2017-2018), once CSDs have obtained their authorisation.

Among others, the CSDR caters for:

- Harmonised rules for the allocation and confirmation process which will help preventing settlement fails;
- The imposition of matching standards and technical functionalities for settlement optimisation such as partial settlement, recycling, hold and release;
- A harmonised settlement penalty regime which aims to deter settlement fails;
- A harmonised approach to Buy-Ins;
- Greater transparency of the levels of settlement internalisation taking place outside of CSDs;
- A single settlement cycle (T+2);
- Common rules for providing access to issues and other market infrastructures.

Please refer to Section 7.3.3. below for further details on the impact of the CSDR on the post-trade landscape.

3.5.4.3. Current and emerging practices [T2S markets]

The on-going migration of 23 CSDs in T2S (by September 2017) has already influenced substantially market practices and rules applicable to the settlement layer of the transaction chain.

The Mid-year T2S Harmonisation Update 2016⁸⁰ provides a very detailed account of the work T2S stakeholders (i.e. NCBs, CSDs and CSD participants) are investing in harmonising settlement rules and procedures, including some of them going beyond the core settlement function. In some cases these practices/rules have become, unintendedly, EU standards, either due to regulation or by mere market influence. See for example T2S community work on settlement cycles (T+2), ISO messages and corporate actions. See Figure 6 for a high level overview of the T2S harmonisation activities on post trade.

The T2S community of stakeholders is currently working on 24 harmonisation activities (i.e. work-streams) with the aim of establishing commonly agreed standards for the 21 T2S markets. As shown in the below Table I, some of these activities have already delivered a standard (green definition status). For the remaining gaps, further work is required, mostly at EU regulatory level.

Table I: T2S harmonisation activities (status as of August 2016)

ACTIVITIES – PRIORITY 1		DEFINITION	MONITOR	COMPLIANCE	
1	T2S MESSAGES	T2S ISO 20022 messages	G	G	G
2		T2S matching fields	G	G	G
3		Interaction for registration	G	G	G
4		Interaction for tax info	G	G	B
5	SCHEDULE OF SETTLEMENT DAY	G	G	G	
6	T2S CORPORATE ACTIONS STANDARDS	G	G	R	
7	LEGAL HARMONISATION	Settlement finality I (moment of entry)	G	X	X
8		Settlement finality II (irrevocability of transfer order)	G	G	G
9		Settlement finality III (irrevocability of transfers)	G	G	G
10		Outsourcing IT services	G	G	B
11	SETTLEMENT DISCIPLINE REGIME	Y	X	X	
12	SETTLEMENT CYCLES	G	G	B	
13	CSD ACCOUNT STRUCTURES	Availability of Omnibus Accounts	G	G	B
14		Restrictions on Omnibus Accounts	G	G	Y
15	T2S ACCOUNTS NUMBERING	Securities accounts numbering	G	G	G
16		Dedicated cash accounts numbering	G	G	G
ACTIVITIES – PRIORITY 2		DEFINITION	MONITOR	COMPLIANCE	
17	LEGAL HARMONISATION	Location of Securities Account/Conflicts of Law	R	X	X
18	CORPORATE ACTIONS MARKET STANDARDS	CA market (CAJWG) standards	G	G	Y
19	PLACE OF ISSUANCE		Y	X	X
20	TAX PROCEDURES	Withholding tax procedures	R	X	X
21	SHAREHOLDER TRANSPARENCY - REGISTRATION		R	X	X
22	MARKET ACCESS		Y	X	X
23	SECURITIES AMOUNT DATA		G	G	G
24	PORTFOLIO TRANSFER		Y	X	X

Source: Mid-year T2S Harmonisation Update 2016.

⁸⁰

https://www.ecb.europa.eu/paym/t2s/progress/pdf/ag/20160905_mid_year_t2s_harmonisation_update.pdf

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The following market practices are based on the agreed T2S standards as well as the T2S system specifications:

- **Timelines and cut-off lines (Giovannini barrier 7):** All T2S markets will comply fully with the T2S schedule for the settlement day and calendar, including night time settlement and all cut-off times for DvP, FoP etc. This is valid not only for those directly interacting with the T2S platform but all CSD participants.
- **Settlement Finality Rules:** T2S CSDs have defined, in their systems, harmonised rules regarding i) the moment of entry of a transfer order (Settlement Finality I – SFI), ii) the moment of irrevocability of the transfer order (SFII) and iii) the moment of unconditional and irrevocable transfer of securities (SFIII).
- **Intraday DVP settlement (Giovannini barrier 4):** Real Time DVP settlement for all 23 T2S CSDs
- **CSDs account structures:** T2S is compatible with any level of CSD account segregation rules. However, and in line with the CSDR, there is an agreed T2S standard requiring the availability of omnibus account in order to facilitate cross-border settlement efficiency. This standard does not exclude any national account segregation rules, including end-investor accounts in CSDs.
- **Settlement cycles:** The CSDR (Art. 5) established a harmonised EU settlement cycle standard up to T+2. The T2S community has played a pivotal role in justifying the business case of such rule as well as the need for further coordination among T2S markets prior to their migration to T2S. The T2S community recommendations on T+2 implementation became the de facto market practice for all EU markets migrating to T+2⁸¹.
- **Securities account numbering:** In securities account numbering, T2S CSDs have agreed to use a four-digit BIC to identify parties of CSDs, plus 31 digits of free text.
- **Cash account numbering:** The T2S dedicated cash account numbering standard includes 34 characters (one to designate the cash account, two for the country, three for the currency code, 11 for the BIC and 17 characters of free text for the account holder). All National Central Banks (NCBs) connected to T2S will comply fully with this standard.
- **Remote access (Giovannini barrier 5):** Practical impediments to remote access to settlement systems is removed following migration to T2S. Access to all T2S CSDs is as easy as with domestic CSD (from a technical perspective).
- **Securities amount data:** In line with the widely followed market practice in the EU, T2S markets should define securities amount data by using nominal value for debt instruments and units for non-debt instruments (i.e. debt instruments in FAMT and equities in UNIT).
- **IT communication protocol (Giovannini barrier 1):** the T2S actors will communicate with the T2S technical platform using a set of ISO 20022 compliant messages (130 messages in total), customised to the specific needs of T2S. Market participants who do not interact with T2S directly, can continue using other ISO or proprietary standards, providing that their T2S CSD offer translation services to enable settlement in T2S. This removes this barrier, at least for T2S markets and the relevant connected actors.
- **Information content of T2S messages (transfer orders):** As agreed by the T2S community, registration details and tax-related information for domestic and cross-CSD transactions should not be exchanged via T2S messages.
- **Corporate Actions (part of Giovannini barrier 3):** All T2S markets should comply with the T2S corporate actions standards by the moment of their migration to T2S. These standards as

⁸¹ https://www.ecb.europa.eu/paym/t2s/progress/pdf/taskforcet2/2014-05-02_HSG_proposals.pdf??56f9ebc5f33842ba6deb57dd94a483bb

endorsed by the AG and published on the T2S website, relate to corporate actions on transaction flows (i.e. market claims, transformations and buyer protection).

The T2S markets should also comply with the Market Standards for Corporate Actions Processing were drawn up by the Corporate Actions Joint Working Group (the CAJWG), a working group of affected industries under the aegis of the European Commission's CESAME2 group. These are standards on stocks (i.e. settled securities positions). For more information on CA management, see section on Asset Management.

3.6. Asset Servicing

3.6.1. Description

The term **asset servicing** relates to events during the life of a security. From the point of view of an investor, the term relates to the process whereby an investor is able to exercise rights relating to the ownership of a securities position during the period of holding securities, i.e. subsequent to settled acquisitions in the primary or secondary market and prior to dispositions by way of sale. In order to exercise such rights for securities held through an intermediary, the investor is dependent on the assistance of the intermediary, and thus on the specific services provided by the intermediary. The specific "asset services" include custody services and related corporate action processing, tax processes, registration processes, shareholder identification processes and general meeting processes as well as value added and ancillary services.

3.6.2. Market Structure

The term 'custody' in a financial market sense refers to the function of safekeeping assets on behalf of investors. This function is carried out by custodians and CSDs. Investors use Custodians to hold their securities and cash through safekeeping (or securities) accounts and cash accounts.

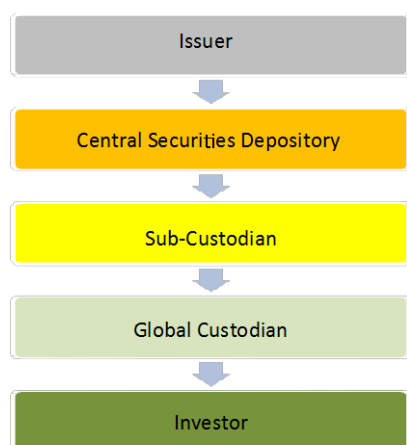
3.6.2.1. Custody chain

End investors (institutional and private investors) typically choose a global custodian for asset servicing services. Global custodians in turn hold their clients' assets either directly or indirectly (through local sub-custodians) in centralised custody with Central Securities Depositories (CSDs). The term 'Issuer' in the graph below includes issuer agents.

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Figure 15: The Custody chain



Source: AFME.

3.6.2.2. Direct holding

In some EU markets, end investor accounts are maintained at the level of the CSD, although end investors are rarely direct CSD participants (the segregated accounts are managed and operated by intermediaries acting as CSD participants). Such practice may or may not be the result of domestic legal requirements (as for example in some Nordic countries and in Greece).

End investor accounts, which are maintained directly with the CSD create transparency on shareholders for issuers.

3.6.2.3. Custody account structures

Custody account structures generally refer to two notions: omnibus and segregated account.

It shall not be made any confusion between the segregation operated by a custodian at the upper level of a chain of custody (i.e. at CSD level on demand of the participant of the CSD or custodian level on demand of the client of this custodian that can be itself a custodian) and the segregation done in the book of a custodian.

In his book a custodian shall proceed to the implementation of a segregated account structure in the name of his clients, with at least one securities account (and cash) per client. There is a distinction made between own account of the client and account for third parties under the administration of a client.

At the upper level, the custodian will at least proceed to a segregation between his own assets and assets belonging to other clients. Further segregation has been required by law to distinguish certain type of assets or certain type of client/investor (UCITS or AIFM funds for instance).

A segregated account is a securities account in which securities are held that belong to a single client which can be in the name of the account provider or in the name of an underlying client but being operated by a third party.

The legislation applicable to account segregation is CSD Regulation and the Delegated Mifid 2 Directive of 7 April 2016: C(2016) 2031 final.

The decision on the account type chosen will have different triggers. While efficiency considerations may be the driver to open an omnibus account, the reasons to choose segregated accounts may rather be transparency, asset protection and/or legal requirements.

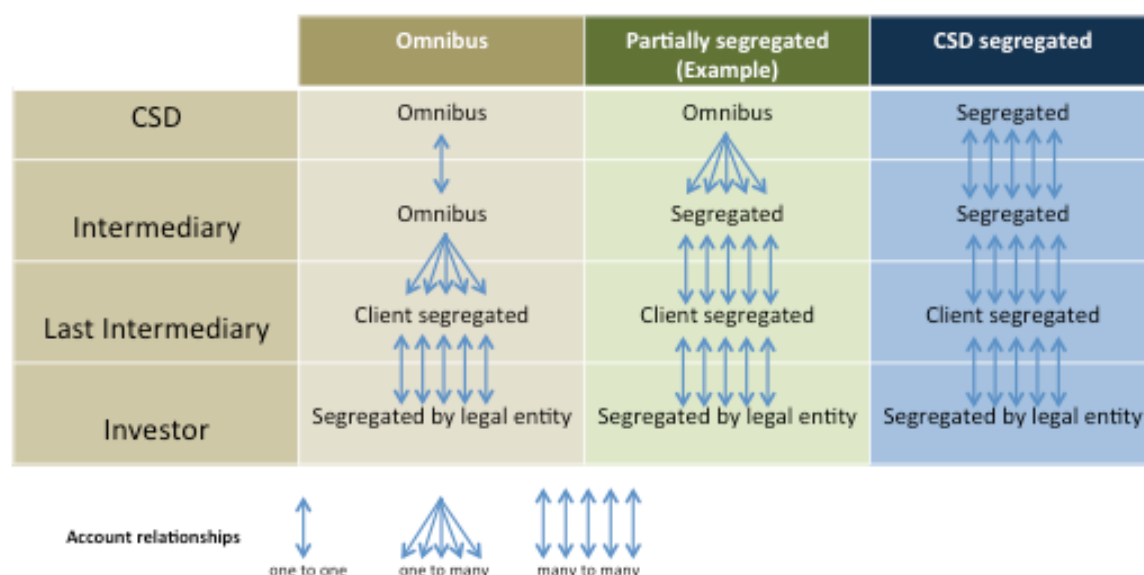
Moreover, it should be noted that accounts are also distinguished between client and proprietary accounts. In the first case this leads to recognition that securities maintained in the account are not owned by the account holder. This is perceived to better protect assets in case of insolvency, at the level of the CSD this can be flagged specifically.

Reference is made to the AFME publication ‘Securities Account Holder Asset Protection, AFME Principles on Asset Segregation and related Due Diligence and Collateral Treatment’⁸².

This publication provides a comprehensive analysis of existing and proposed regulation that impacts client asset protection and proposed principles on segregation of client assets and client account holding structures from a holistic and integrated operational, legal and compliance perspective that simultaneously ensure adequate safety of client assets while minimizing operational complexity and cost.

Reference is also made to the ISSA research paper “Transparency in Securities transactions and custody chain: study on the benefits and costs of securities accounting systems”

Figure 16: Custody Account Structures



Source: AFME (with slight modifications from EPTF members).

Custody Chain contains multiple layers with several involved parties

The custody chain typically starts in every case at the level of the entity performing the notary function of a given financial instrument. This could be a registrar but in many cases it is the CSD, which in addition maintains securities account at the highest level and operates a dedicated securities settlement system, which ensures that securities can be transferred in a book-entry method.

At this level CSD Participants have opened accounts at the CSD depending on the market and the subsequent legal requirements in addition to the account structure requested by their clients. As per the ECSDA Report from 2015⁸³ a number of different account models exist in Europe today:

- Omnibus markets;
- Hybrid markets with individual client segregation: 2 countries (2 CSDs): ES, LU;

⁸² <http://www.afme.eu/Divisions/Post-Trade/>. The graph has been slightly modified by EPTF members.

⁸³ http://ecsd.eu/wp-content/uploads/2015_10_13_ECSDA_Segregation_Report.pdf

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- Hybrid markets with end-investor segregation: 9 countries (9 CSDs): CY, CZ, DK, EE, IS, RO, SE, SK, UK;
- Segregated markets on end-investor level: Segregated markets at end-investor level: 7 countries (7 CSDs): BG, FI, GR, HR, MT, NO, SI.

As those CSD participants usually also have underlying clients for which they provide custody services the account structures are continued at the level of the CSD participants and their respective clients down to the ultimate final beneficiary. Every party in the chain identifies in its books and records the immediate account holder for whom the account has been opened. Additionally, if required or requested by the client an underlying beneficiary could be mentioned.

From the other end of the chain investors usually would appoint another financial institution for the safekeeping of their securities at a CSD directly or indirectly. With this it is avoided that significant investments are required to connect to the CSD infrastructure directly. Depending on their investment scope they may appoint a Global custodian (GC), which is able to offer a custody service on a global basis. For some investors this appointment is mandated by law (UCITS /AIFM etc.) The GC would then appoint a party in the required markets, which establish the connection to the CSD infrastructure. With CSDR a level of harmonization will be introduced to cater for different account set-ups at the level of the CSD and the level of the CSD participant.

As will be detailed further in the sections below asset servicing will be performed at every level of the custody chain. With Information having to flow back and forth through the custody chain, every party will have to play its role for an efficient process.

The use of individual accounts in the asset servicing space increases the operational costs involved in the processing as every account would have to be processed and reconciled separately.

Nominee concept

A nominee can be described as a person or entity named by another to act on its behalf. Under some circumstances, a legal system may view an intermediary, i.e. a nominee, and not the end investor, as being the legal owner of a specific security. A market's recognition of this concept means that the holding of securities by an account provider acting in its own name for the account of another person or other persons is accepted in the market. This "market acceptance" may be limited to certain category of accounts. For example, the use of nominee may be accepted only for non-resident.

3.6.2.4. Entitlement rules

Asset servicing events are events that occur during the life-cycle of a security and that give a right or a benefit to the holder of the security, or that change the characteristics of the security that is being held.

Corporate actions form the main part of asset servicing. There are two basic types of corporate action event, namely distributions and reorganisations.

A distribution is an event whereby the issuer of a security delivers particular proceeds to the holder of the security without affecting the security itself.

A reorganisation is an event whereby the security itself is replaced by proceeds. In both cases proceeds may be cash or/and securities.

Some events are a combination of these two basic types, following a two steps process: distribution (of rights), reorganisation (for investor having received these rights) where the distributed rights are "reorganised".

In addition to the two basic types, there is a third type of event, namely the exercise of a right to attend and/or to vote at a general meeting of share/bond- holders. However, there is an important particularity in that there is no booking on an account of the right (to attend/vote), so that the operational processing of the exercise of the right is very different.

For all types of asset servicing events, there is both a trading logic, and a settlement logic. The trading logic is derived from the perspective of the investor.

The trading logic sets out who (between a buyer and a seller) is entitled to participate in or benefit from an event (e.g. who is entitled to receive the proceeds from a distribution, such as the payment of a cash dividend).

The settlement logic is derived from the perspective of the issuer.

The settlement logic sets out who the issuer (or its agent) will consider from an operational perspective as being entitled to participate in or benefit from an event (e.g. - in the case of a cash dividend - to whom the issuer actually pays the money).

The trading logic uses the concepts of “ex-date” (for distributions) and “guaranteed participation date” (for reorganisations).

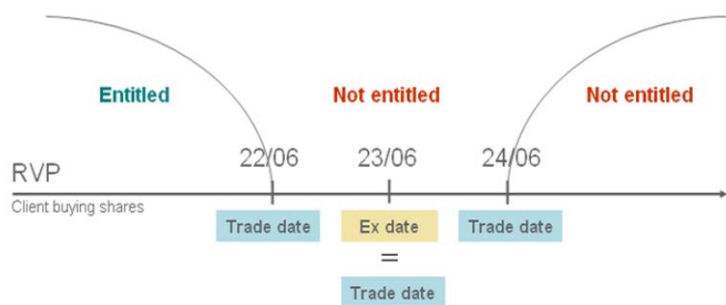
The ex-date is the date from which a security is traded without the right to a specific distribution (so that from the ex-date of a cash dividend any new purchaser is not entitled to receive the dividend).

Figure 17: Base-holding rules for pending trades: trade date compared to ex-date

Baseholding rules for pending trades: Trade date compared to ex date

Pending receipt (security credit)

- ✓ If trade date before ex date and receipt >> entitled
- ✓ If trade date after ex-date and receipt >> not entitled
- ✓ If trade date equal to ex-date and receipt >> not entitled



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Source: The Bank of New York Mellon training material.

The guaranteed participation date is the last date on which a buyer can buy a security, and still be entitled to choose the outcome of a reorganisation (in the event that a reorganisation allows for a choice i.e. is an “elective” event).

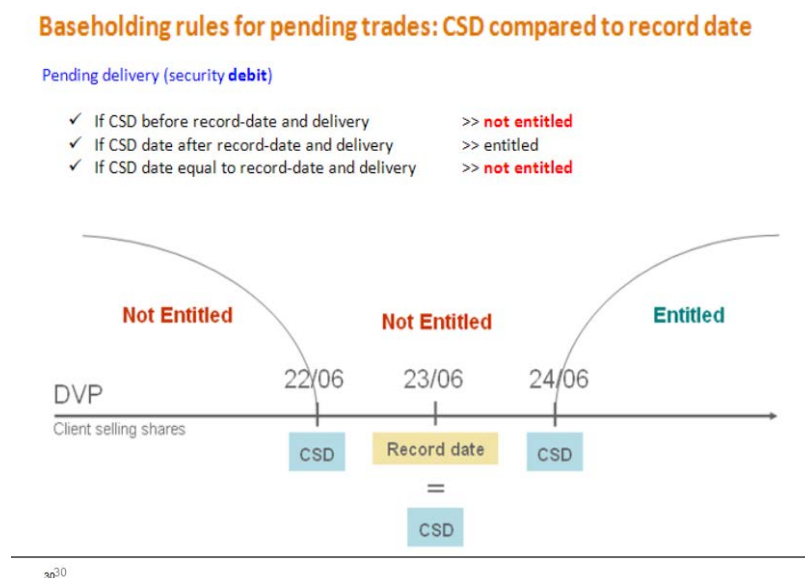
The settlement logic uses the concept of “record date”; the record date is defined as “the date on which settled positions are struck in the books of the Issuer (I)CSD at close of business day to determine the entitlement to the proceeds of a Corporate Action”. In short, at close of business on record date, issuers or their agents identify the actual, booked securities positions on accounts

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provided by the Issuer CSD, and use these positions in order to effect the operational processing of a distribution or of a reorganisation.

Figure 18: Baseholding rules for pending trades: contractual settlement date compared to record date



Source: The Bank of New York Mellon training material.

It is possible that for any given securities position the calculations of entitlement based on the trading logic and on the settlement logic do not arrive at the same outcome. For example, a seller may sell a securities position before ex-date (so that the buyer, and not the seller is entitled to a cash dividend), but the seller may receive the dividend, if the seller still holds the securities position on record date, whatever the reason may be.

There is a set of processes (called “market claims” for distributions, and “transformations/buyer protection” for reorganisations) whose objective is to reconcile the trading logic and the settlement logic so that the “entitled” party from a trading perspective does indeed receive the correct “entitlement”. (In the example of the previous paragraph, there will be a “market claim” that transfers an amount equal to the cash dividend from the seller to the buyer).

The rules governing entitlements, and the correct usage of the dates set out in those rules, are important for the correct processing of corporate action events.

Lack of clarity on entitlements, as well as problems deriving from a specific sequence of relevant dates (ex-date, record date, deadline date, etc.), may have knock-on effects on the processing of an asset servicing event, and on the ability of an end-investor to participate in an event.

Examples of sources of problems include:

- an inappropriate sequence of dates (which increases the need for reconciliation between the “trading” logic and “settlement” logic);
- a lack of agreed market practices and tools on how to effect the “reconciliation” i.e. lack of procedures, limited standardisation with respect to “market claims”, “transformations/buyer protection”:

- entitlement dates that are set very close to market deadline dates for elective events (so that entitled holders may in practice be unable to send instructions that arrive before the deadline).

3.6.2.5. Registration

The standard settlement logic for the distribution of entitlements arising from corporate actions is based on the settled positions at the issuer CSD as of close of business on record date. However, in some cases, issuers or issuer agents distribute entitlements based not on the record date positions at the issuer CSD, but rather based on the record date positions recorded on a parallel system. The most common example of such a parallel system is the case of a security issued in the legal form of a registered security, and which has a register that is not maintained by the issuer CSD, but is instead maintained by a separate entity.

In the case of such registered securities, there is the possibility that the records of the two systems are not fully aligned, so that, for example, there is the possibility that an investor who is the record date holder at the CSD of a securities position may not be entitled to the distribution based on the record date position at on the register.

There are two basic reasons why there could be a misalignment. A misalignment can arise if, for example, the register is not automatically updated following settlement at the CSD, and there is some kind of separate registration process.

A misalignment can also arise if the register maintains information that is relevant for the entitlement calculation, but that is not maintained by the issuer CSD. An example of such information is the period of time in which a specific securities position has been registered in a specific name; in some cases shareholders who have held securities registered in their name for a specific period of time may benefit from additional rights, such as additional voting rights.

Misalignments between the records of the issuer CSD and the registrar create two types of problems for end investors and intermediaries in the custody chain.

One problem arises for the end investor that has purchased a securities position that has settled on or before record date, but that is not the registered holder as of record date in the register. Such an investor may well not be able to exercise full ownership rights with respect to its record date position. In general, such a loss of rights will not take place for entitlements involving cash or securities, as the “market claim” and “buyer protection” processes should safeguard the interests of the purchaser. However, such a loss of rights can take place with respect to voting rights, as there is no “market claim” process for voting rights.

If the information relating to securities positions at the issuer CSD level is insufficient to identify the specific rights associated with those securities positions, then intermediaries have a problem in how to reflect in their books the specific rights of their clients. This is an information management problem for which there is no standard industry solution.

3.6.3. Market Practices

Core asset servicing processes include:

- Corporate Actions Processes;
- General Meetings Processes;
- Shareholder Identification Processes;
- Custody related Tax Processes.

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To harmonise and standardise corporate actions processes and general meetings processes dismantling thus Giovannini Barrier 3, industry solutions have been developed and agreed that are currently implemented in all European markets. These standards described the targeted processes in detail.

3.6.3.1. Corporate action processes: description

A corporate action on a security is in most cases initiated by the issuer of the security. In practice, many issuers use issuer agents to help administer the corporate actions process.

It is standard practice that issuers and issuer agents use the CSD at which the security is deposited as the principal mechanism for processing a corporate actions, and as the point of contact between the issuer (or its agent) and the investor (or its agent).

The main reason for this is that both for the issuer (or its agent) and the investor (or its agent) it is cheaper, easier and more secure - and it may be legally required in the case of dematerialised securities - to interact with one entity (the CSD) than with multiple entities. (If communication and processing took place outside the CSD, then each issuer or issuer agent would have to communicate with multiple CSD participant, and each CSD participant would have to interact with multiple issuer agents (as each CSD participant may hold positions in multiple securities)).

In order for a corporate action to be processed, and for investors to be able fully to exercise their rights, all parties in the chain, from issuer or its agent through the CSD, and through all intermediaries in the custody chain until the end investor, need to have the capabilities of processing the corporate action correctly, and need the ability to communicate in a standardised and secure manner.

The main types of corporate actions include dividend or interest payments, capital redemptions, rights issues and tender offers. Tender offers may be initiated by issuers, but in some cases are initiated by third parties e.g. in case of a take-over offer.

The two main categories of corporate action events are:

- Distributions, where the underlying security remains unchanged;
- Reorganisations, where the underlying security is exchanged for securities or cash.

Corporate actions can also be categorised as:

- Event with no choice;
- Event with election from the investor.

Events with no choice (“non-elective events”) are the simplest one in terms of process, Events with election (“elective events”) from the investor are the more complex and, as a result, risky to process.

The distinction in terms of process can be conceptually simplified as followed:

- the first typology of events gathering, distributions and pure mandatory reorganisation can be seen as a twin top down phase of processes covering:
 - 1 top down phase of information
 - 2 top down phase of proceeds
- the second typology of events all elective events i.e. that request the expression of choice per the investor (reorganisation with options, distribution with options and voluntary reorganisation) can be seen as a triple top down phases of processes with one and bottom up phase of processes:
 - 1 top down phase of information
 - 2 top down phase of rights for choices

- 3 bottom up phase of expression of choices
- 4 top down phase of final proceeds

The longer the chain of intermediaries, the more important it is that there be automated processes, and standardised communications, along the full chain between issuer and investor. Manual processes, and non-standardised and incomplete communications, may introduce delays in the process that hinder the full exercise of rights by the end investor.

Complexity of corporate events

The above description is a simplified presentation.

For instance, a dividend payment with option given to investor to choose between proceeds in cash or securities is a distribution of rights to express choices followed by a reorganisation (with options) of these rights to be change in cash or in securities.

It follows then an announcement phase of processes under a top down flow then state a distribution of rights under a top down flow and begin a bottom up process to deliver the rights before Market deadline with an expression of choice between two options (cash or securities) and to end with proceeds on payment date under a top down process.

All of these steps need to be achieved in a limited period of time, having in mind that financial market condition may lead originator of a Corporate Event to shorten the period of exposure to market risk.

It means that the whole chain of players (issuers, issuer agents, CSDs, intermediaries, final investors) are running against the clock to permit investor to benefit from their rights.

This degree of complexity has for result that entities that deliver securities processing services need much more staff (ratio of four to one) to handle asset servicing than to handle trades / transactions.

3.6.3.2. Corporate action market practices: Market Standards for Corporate Actions Processing⁸⁴

3.6.3.2.1. Objectives

In the Giovannini Reports corporate actions processing is dealt with as Barrier3. Corporate actions processing is deemed one of the most complex areas of post trading. Standardising and harmonising these processes across all European markets aims at achieving a significant reduction of respective costs and operational risks.

An industry working group, the Corporate Actions Joint Working Group (CAJWG) that encompassed all relevant constituencies, i.e. issuers, financial market infrastructures and banks/intermediaries have developed in 2007 / 2008 a comprehensive set of some 120 market standards for the operational processing of all categories of corporate actions including transaction management. These standards, agreed and endorsed by all relevant constituencies, were revised and amended in 2012.

3.6.3.2.2. Categories

The market standards cover the following categories of Corporate Actions (rather than individual event types) as well as transaction management:

⁸⁴ [http://afme.eu/uploadedFiles/Content/Divisions_\(Public\)/PostTrade/Market%20Standards%20for%20Corporate%20Actions%20Processing,%20revised%202012.pdf](http://afme.eu/uploadedFiles/Content/Divisions_(Public)/PostTrade/Market%20Standards%20for%20Corporate%20Actions%20Processing,%20revised%202012.pdf)

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- Distributions
 - Distributions:
 - Cash Distributions (e.g. cash dividend, interest payment)
 - Securities Distributions (e.g. stock dividend, bonus issue)
 - Distributions with Options (e.g. optional dividend)
- Reorganisations
 - Mandatory Reorganisations with Options (e.g. conversion)
 - Mandatory Reorganisations (e.g. stock split, redemption)
 - Voluntary Reorganisations (e.g. tender offer)
- Transaction Management
 - Market Claims (Distributions)
 - Transformations (Reorganisations)
 - Buyer Protection (Elective Corporate Actions)

3.6.3.2.3. Scope of application

The scope of application of the market standards includes:

- all types of the above categories of Corporate Actions (Distributions and Reorganisations);
 - all securities used for direct investments (equities, fixed income instruments) deposited and settled in Book Entry form with an (I)CSD in Europe; investment funds listed and traded on a regulated trading venue should be processed, where possible, in accordance with the applicable standards hereof;
 - all parties involved, i.e. Issuers, market infrastructures (trading, clearing and settlement), Intermediaries and End Investors, except for standards for transaction management which are directed at market infrastructures and Intermediaries only.

3.6.3.2.4. Subject matter

The subject matter of the standards concerns:

- the information flow throughout the chain of relevant parties;
- key dates and their sequence;
- the operational processing of Corporate Actions.

3.6.3.2.5. State of implementation

To implement the Market Standards for Corporate Actions all European markets have set up National Market Implementation Groups. Their representatives are meeting in semi-annual (now annual) intervals at the workshops of the European Market Implementation Group (E-MIG) to monitor the progress of the implementation process.

At the most recent E-MIG workshop of November 2016 in Madrid an overall advanced state of implementation was evidenced.

As the figure below demonstrates, this is particularly the case for the 8 major markets, i.e. France, Germany, Italy, The Netherlands, Spain, Sweden, Switzerland, UK / Ireland:

Figure 19: State of compliance of the 8 major markets with the Market Standards for Corporate Actions Processing, November 2016

Progress report consolidated 8 major markets
(all standards)
2016



Source: Documentation E-MIG workshop November 2016 in Madrid.

Relation to CASG Rules and global principles (ISSA)

The market standards for Transaction Management, i.e. Market Claims, Transformations and Buyer Protections have served as a basis for T2S related corporate actions standards on flows (i.e. on pending transactions) (see section 3.6.3.3. T2S corporate action standards).

ISSA, the International Securities Services Association, has condensed the Market Standards for Corporate Actions Processing into higher level global principles⁸⁵.

3.6.3.2.6. Impact of amended Shareholder Rights Directive

The implementation of the Market Standards for Corporate Actions Processing are significantly supported by the provisions of the amended Shareholder Rights Directive in regard of (i) end-to-end communication / transmission of information (Art 3b.2 and 3b.3) and (ii) the facilitation of the exercise of shareholder rights by intermediaries (Art 3c.2). However, it will be crucial that when the European Commission adopts implementing acts and Member States transpose the amended Shareholder Rights Directive into national law the Market Standards for Corporate Actions Processing are considered to the highest possible extent to preserve the value of harmonisation and thus the reduction of risk and cost achieved in the process of implementing the standards.

⁸⁵ http://www.issanet.org/pdf/ISSA_WG_CA-PV_Final_Report_June2012.pdf

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3.6.3.3. T2S Corporate Action Standards

3.6.3.3.1. Objectives

The TARGET2-Securities (T2S) corporate actions standards were endorsed by the T2S Advisory Group in July 2009, and were subsequently updated in May 2013.

The objective of the T2S corporate actions standards is to ensure that the processing of corporate actions on flows (market claims, transformations, and buyer protection) is effected on T2S in a fully harmonised way in all T2S markets.

Non-compliance with these standards by T2S markets would hamper the efficient management of corporate actions on flows on T2S, especially in the context of cross-CSD settlement.

3.6.3.3.2. Scope of application and subject matter

The T2S corporate actions standards are based on, and are fully consistent with, the Market Standards for Corporate Actions.

The T2S corporate actions standards are more limited in scope than the Market Standards, as the T2S standards cover just corporate actions on flows (market claims, transformations, and buyer protection), and not the full range of corporate actions processing on stocks.

As a general rule, the T2S corporate actions standards are more detailed than the Market Standards; they also cover a number of T2S specificities, such as the specific question of which CSD should generate a market claim in the case of a cross-CSD transaction in T2S (i.e. settlement between securities accounts provided by two different CSDs on the T2S platform).

3.6.3.3.3. State of implementation

The T2S governance has a well-established methodology and process to define T2S standards, to establish a mechanism to monitor compliance of T2S markets with T2S standards, and to publish the results of the monitoring mechanism.

Table J: Compliance status of T2S markets- Corporate actions standards

Blue	CH, GR (BOGS), MT, BE(NBB-SSS)
Green	DK, EE, ES, FI, HU, LT, LU (LUX CSD), LU (VP LUX), SI,SK, LV
Yellow	None
Red	AT, BE (Euroclear), DE, FR, IT, NL, PT, RO

Source: Mid-year Harmonisation Progress Report Update 2016 / Information input: CASG gap analysis (status August 2016)⁸⁶.

⁸⁶ https://www.ecb.europa.eu/paym/t2s/progress/pdf/ag/20160905_mid_year_t2s_harmonisation_update.pdf?93d633442d26435ee23579abf2c9e4f8

The most recent set of monitoring results were published in 5 September 2016 in the Mid-year T2S Harmonisation Update 2016⁸⁷. The results show that four of the six markets and CSDs that migrated on to T2S during 2015 and during the first half of 2016 (i.e. CSDs part of the T2S Migration Waves 1 and 2) have achieved full compliance with the T2S corporate actions standards. Eleven T2S markets and CSDs have a green status, which shows that they plan to comply fully with T2S corporate actions standards at their point of migration on to T2S. Full compliance as of T2S migration was uncertain for two markets and CSDs, while seven markets and CSDs were, or were expecting to be, not fully compliant as of point of migration.

3.6.3.4. Custody related tax market practices

Withholding taxes

Investors in securities are entitled to receive the income distributed on the securities. For equity securities the income usually takes the form of a dividend while for debt securities the income takes the form of an interest. Cash benefits paid as income to investors are usually subject to withholding taxes (WHT). The tax authority of the country where the investment is made (for a dividend this is the country where the company paying the dividend is based; for interest on debt securities this is the country of the issuer of the debt security) determine the rate of withholding that will apply. In some cases this may be zero, in others it is a significant rate. In addition to the withholding tax applied in the country of investment, the investor is also usually subject to tax in his country of tax domicile. This means that his income is double-taxed. Many governments have recognized this issue as being unfair and allow part or all of the withholding tax to be reclaimed, by entering into double taxation agreement (DTA) with other, like-minded governments. The objectives of these DTAs are:

- To prevent income being taxed twice;
- To ensure that income on domestic assets are treated similarly as income on cross-border assets;
- To render reciprocal assistance to prevent tax evasion.

Withholding tax rate are usually based on four broad categories of criteria:

- The type of investor (e.g. corporation, mutual fund, pension fund, charity, individual, central bank, government, etc.);
- The tax domicile of the investor;
- The type of security (e.g. bonds, equities, fund shares, etc.);
- The market in which the investment is made and the existence or non-existence of double-taxation agreements (DTA).

From the perspective of the investor and of the custodians in the custody chain, it is important that the investor be taxed at the correct rate (i.e. the applicable DTA rate), and not be subject to a higher tax rate. Custodians and/or intermediaries play an important role in supporting their clients to achieve this objective, which can be achieved in different ways:

- The most efficient manner is to obtain the correct withholding tax rates is by certifying in the investment market the precise characteristics of the investor. Based on the DTA between the country of investment and the country of domicile and based on the

⁸⁷ https://www.ecb.europa.eu/paym/t2s/progress/pdf/ag/20160905_mid_year_t2s_harmonisation_update.pdf

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certification, the income will be taxed at the lowest rate. In some countries the required certification needs to be renewed periodically.

- The alternative is for the income to be double-taxed, first in the country of investment and later in the country of domicile. The custodian/intermediary will later file a tax reclaim, on behalf of the investor. The objective of the tax reclaim is to reclaim the difference between the double taxation and the WHT agreed in the DTA. Once the tax reclaim has been filed, it must be properly monitored until the excess tax is repaid. In some countries the period between the filing of a reclaim and the moment it gets paid can be quite long, often years.

Supporting investors in their objective to get the lowest WHT possible is complex, not easily automatable and resource consuming. The rules evolve regularly. There is a wide multiplicity of combinations.

When omnibus accounts or nominees are used in the investment market, they usually contain the assets of multiple (final) beneficiaries, which may represent different types of investors. In such situation the tax information that the intermediary need to collect must usually be based not on information of the account holder, but on information of the multiple final beneficiaries behind the account holder.

The tax processing relating to payments paid on positions held by the investor on record date is complex; what is potentially even more complex is the tax processing relating to payments, to which the investor is entitled, but which derive from securities positions which the investor did not hold on record date (i.e. payments in the form of market claims).

For such payments, there is no common understanding as to whether such payments should be treated as taxable dividend payments, or treated as compensation payments. Tax processing relating to market claims varies considerably between countries. In the context of T2S, and a joint technical settlement platform, this generates considerable complexity.

Transaction taxes

In the limited number of countries where a transaction tax is collected, it is collected largely at the trading level with limited involvement of post-trade players. CSDs may be used as the collection tool of the transaction tax due by the investors. In such case intermediaries are asked to transmit information through the chain of custody to the CSD. One question that remains to be clarified if the usage of transactions were to be broadened is whether the transaction tax applies also to corporate actions related transactions such as dividend reinvestment or right issue.

Capital gain taxes

A growing number of countries have started taxing investors on the capital gains (or losses) on their investments. When the securities in which an investment is made are simple securities, like equities or bonds, post-trade actors involvement is usually limited to the provision of capital gain (or loss) information, that investors will use in their dealing with the local tax authorities. In a few countries (Belgium, Italy and maybe others) custodians have obligations to gather information, make calculations, and effect reporting (and maybe other things as well). Obligations placed by national fiscal authorities on custodians to effect capital gains tax processing (including gathering of information, calculations and reporting) could serve as a barrier to entry, and thus create silos in markets for the provision of custody services. This barrier is clearly more important for the provision of services to retail investors, than for the provision of services to wholesale investors.

When the securities are fund shares, the process is more complex. Intermediaries must provide to their clients the part of the net asset value (NAV) of the fund share that is attributable to capital gain and the part that come from income collected by the fund.

When portfolios are moved from one account provider to another the information on the capital gains or interim gains will have to be transferred to the new account provider. The methods to calculate this and to transfer this information are diversified in Europe. (This issue should be looked at in parallel with the portfolio transfer section in the Settlement chapter).

Supporting tax transparency

With the growth of cross-border investment, investors collect income outside of the country of their tax domicile. Tax authorities are eager to obtain such information without having to rely solely on information provided by the taxable investor. In order to achieve this, over the recent years, countries are reaching agreement on automatic and mutual exchange of information related to the investment and related income of investor of the other country. Common reporting standards have been signed by a significant number of states, with the exception in particular of the United States⁸⁸.

In a growing number of countries, tax authorities are trying also to collect information related to:

- Income collected by investors when investing outside their country of tax domicile;
- Capital gain on investments performed outside their country of tax domicile.

The best example of such is the US FATCA. With FATCA, US authorities are targeting US based investors investing in vehicles, in particular funds, outside the US. The sponsors of such vehicles must report to the US authorities, either directly or via their local tax authorities.

Intermediaries supporting investment vehicles such as funds need to support their fund clients in the provision of the required information to the tax authorities. The complexity of the information requirement and the lack of harmonization of information requirements constitute the two biggest challenge of this emerging development.

3.6.3.5. Issues related to custody related tax market practices

3.6.3.5.1. EU Commission actions to establish market standards regarding withholding taxes⁸⁹

The Giovannini reports of 2001 and 2003 identified several issues related to withholding taxes as a barrier to efficient cross border investment of securities.

In 2005, the Fiscal Compliance Experts Group (FISCO) was established as a subgroup of CESAME 2. Two reports were issued by the subgroup in 2006 and 2007. The first report was “A fact finding study on fiscal compliance procedures related to clearing and settlement within EU”. The second report proposed “Solutions to fiscal compliance barriers related to post trading within the EU.

In 2009 the EU Commission issued a Recommendation (2009/784/EC) on withholding tax procedures. The objective of the recommendation was to improve the procedures for granting withholding tax relief on cross border securities income.

In June 2010 the Tax Barriers Business Advisory Group (TBAG) was created, initially as a continuation of the FISCO sub-group of CESAME 2, and later as an independent expert group.

⁸⁸ (i) Directive on Administrative Cooperation (DAC) 2011/16/EU (amended in 2015). This represents a significant step towards the implementation of common tax reporting standards across EU. If correctly implemented, the DAC could pave the way for a simplification of the WHT relief procedures.

(ii) 2014 OECD, Common Reporting Standard (CRS), calling on jurisdictions to obtain information from their financial institutions and automatically exchange that information with other jurisdictions on an annual basis.

⁸⁹ http://ec.europa.eu/finance/financial-markets/docs/clearing/tbag/130524_tbag-report-2013_en.pdf

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In 2013 the TBAG issued a report on “Workable solutions for efficient and simplified compliance procedures related to post-trading within the EU”.

In 2016, in the framework of the CMU efforts, the EU Commission has established an “Experts group on barriers to free movement of capital” which may also look at the withholding taxes issues.

Executive summary of the TBAG report of 2013:

Member States currently adopt a variety of different approaches to the issue of withholding tax, which has been described in previous reports and the work of Alberto Giovannini. These problems can be broadly categorised as follows:

- Concerns over the legal basis under which cross border tax simplification could be implemented;
- Lack of adequate or consistent interpretive guidance from Member States;
- Lack of a consistent tax relief model between Member States;
- A plethora of procedures, forms and information requirements from Member States;
- Lack of a mandate for the use of automation and standards.

The T-BAG Group has reviewed these issues in context to the different withholding tax systems currently operated by Member States in detail and its recommendations for specific issues to facilitate Member States adopting a simplified approach. As part of its review, and in context to the FISCO recommendations, the T-BAG Group also reviewed the remedial tax reclaim processes of Member States and makes recommendations here for the provision of an E.U. wide standardised tax reclaim which would lend itself to the transition by Member States from paper based reclaim processing, to electronic and thus contribute to achieving the removal of some of the tax barriers laid out by Professor Alberto Giovannini.

Summary of the Proposed Solution Framework

The solution recommended has the following major characteristics. If the recommendations are approved by Member States, further work will produce the lower level detail for a workable phased implementation.

1. Member States agree a common standardised “Authorised Intermediary” Agreement (“AIA”) which may be entered into between a financial intermediary and a Member State.
2. All Agreements would provide rules for the conducts of (i) documentation of reporting and (v) control and oversight; beneficial owners, (ii) application of relief at source on payments, (iii) withholding, (iv) information.
3. Member States agree a common form and distribution mechanism (e.g. web site) for Guidance on the application of treaty benefits to different types of beneficial owner on which an AI may rely, subject to the understanding that such guidance does not over-rule a Member State’s ability to question any specific case for a claim of treaty entitlement. It is envisaged that existing mechanisms for clarification of individual cases would still be available.
4. The identification of beneficial owners to be permitted by AIs through the mechanism of (i) Taxpayer Identification Numbers (TINs) issued by the beneficial owner’s home State, (ii) application of the KYC rules of the AI’s home State, to the extent that the source State accepts the degree to which, in its view, KYC rules establish beneficial ownership and (iii) agreement by Member States to the development and use of a common and electronically transmissible self- certification of residency (“Investor Self-Declaration” or “ISD”). To the extent possible, the system should permit the use of Powers of Attorney (“PoA”) to allow AIs and authorised third parties to facilitate any additionally required documentation.

5. Provided the documentation and identification rules are met, AIs would be permitted to make (or instruct) payments to eligible beneficial owners net of the appropriate treaty rate of withholding tax on pay date.
6. Liability for under-withholding and/or incorrect documentation of beneficial owners should lie (i) with the beneficial owner (for incorrect or fraudulent representations), (ii) the AI for processing errors and (iii) the Source Member State for technical issues related to treaty eligibility, the latter being minimised through the clear Guidance proposal.
7. AIs servicing beneficial owners directly would provide annual information reports (i) to the source State at beneficial owner level of disclosure and (ii) upstream at pooled level (by withholding rate applied) to other AIs in the payment chain. Such reports to be electronic and to a format standardised between Member States e.g. XML.
8. Where a source country receives information reports from an AI and wishes to query the eligibility of any beneficial owner, Exchange of Information rules would be applied to permit the source country to apply directly to the home country using the TIN of the beneficial owner.
9. Under the terms of an AI agreement, AIs would be subject to a choice of internal review, certified by a responsible officer and subject to appropriate penalties, or external oversight by an approved independent third party by means of an Agreed Upon Procedure (“AUP”) whose report would be available to the Source Member State. Governments would retain the right to undertake spot checks in both cases.
10. For those beneficial owners who were unable to meet the relevant documentation standards prior to pay date, but where they can still prove eligibility under a treaty, Member States agree to develop a standardised, machine readable tax reclaim form capable of being delivered electronically.

Assessment of the progress made by EU member states to implement TBAG recommendations⁹⁰:

The T2S Advisory Group (AG), with the help of its Harmonisation Steering Group (HSG), issued in 2014 a survey in order to identify the level of adoption of T-BAG (Tax Barriers Advisory Group) recommendations in the 21 T2S markets. The results showed that the level of adoption in these markets was very low. With the launch of the European Commission’s CMU Action Plan, the issue of harmonising cross-border withholding tax procedures has come back to the agenda. The AG carried out a further survey between January and February 2016 and invited the T2S National User Group (NUG) members to briefly outline the main elements of withholding tax relief procedures in their respective national markets as well as in the European markets in which they actively carry out business. NUG members were also asked to provide concrete evidence of any issues they deem problematic. Nineteen, out of 21 T2S NUGs, plus UK and IE provided a response to the survey

Key findings

The T2S AG has identified the following key points in the responses:

1. The rules for tax refund or tax reclaim differ between Member States. T2S markets follow different rules in terms of which assets and actors are subject to the withholding tax procedures.
2. Most financial instruments and classes of investors, including retail ones, seem to be affected by cumbersome withholding tax procedures. In most markets, the issuer or its

⁹⁰ https://www.ecb.europa.eu/paym/t2s/progress/pdf/hsg/mtg13/2014110506_item_4_1_monitoring_results_for_withholding_tax_relief_procedures.pdf?0ba8f26d6cbcad36837765b551780455

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appointed agent is responsible for managing the withholding tax procedure. Non-domestic institutions are usually excluded from offering the service.

3. Back office functions and asset servicing are mainly impacted by the withholding tax procedures since they are usually responsible for tax processing within intermediaries.
4. The mostly manual procedures can take anywhere between 90 days to 4 years in some markets. Often, physical tax reclaim forms have to be signed and stamped by all relevant actors in the chain (investors, local tax authorities, paying/fiscal agents), translation services are required and foreign intermediaries are excluded from offering the withholding tax relief.
5. This non-harmonised EU environment, in particular in the context of increased cross-border connectivity (see T2S), may lead to regulatory/tax arbitrage among EU countries. Some markets may find themselves in disadvantage due to their complex tax reclamation procedures if investors decide to move their activities in other, more efficient, ones.
6. It appears that recent EU regulatory initiatives may result in unintended and contradicting outcomes. Although EU public initiatives on facilitating tax relief (T- BAG) are welcome by the T2S stakeholders, recent initiatives to potentially restrict tax benefits in treaties may have the opposite effect and fortify, rather than remove, cross-border barriers.
7. Non-harmonised initiatives across T2S markets. The responses provide evidence to various national measures adopted recently in order to address withholding tax relief issues. However, the responses also provide evidence that there is a lack of harmonisation, standardisation and coordination among these initiatives.

3.6.3.5.2. OECD TRACE recommendations OECD actions regarding withholding taxes⁹¹

In 2006 two OCDE committees agreed to pursue work on improving the process by which securities investors may claim double taxation treaty benefits. An Informal Consultative Group (“ICG”) made up of government representatives and of experts from the business was created.

The ICG initially produced two reports:

- The first report (“Granting Treaty benefits with respect to the income of collective investment vehicles”) addressed technical issues related to these incomes and made a series of concrete recommendations regarding these issues.
- The second report (Possible improvements to procedures for tax-relief for cross-border investors”) discussed the problems in claiming treaty benefits and included a number of “best practices” recommendations. The objective of these best practices is two-fold: (i) to develop systems that are as efficient as possible, in order to minimize administrative costs and (ii) to identify solutions that do not threaten or ideally enhance countries’ ability to ensure proper compliance with tax obligations.

In January 2009 the OCDE Committee of Fiscal Affairs (“CFA”) approved the formation of a Pilot Group to pursue the work. A draft of the implementation package was published in December 2009, relating to the second ICG report. In January 2010, the CFA decided to publish the draft package for consultation and decided to establish a dedicated TRACE group, made up of government delegates, to further develop the draft package. The revised version of the Implementation package, taking into account comments received on the draft and the work of the TRACE (“Treaty Relief and Compliance Enhancement”) group, was approved by the CFA in January 2013.

The system proposed by the implementation package will allow “authorised intermediaries” to claim exemption or reduced withholding tax on behalf of their customers. The system favours relief

⁹¹ http://www.oecd.org/ctp/exchange-of-tax-information/TRACE_Implementation_Package_Website.pdf

at source as the primary means to achieve reduced withholding. The package proposes a series of model documents to be used making clear that electronic communication must be used. The package addresses possible approaches for a country to adjust its domestic law to the framework proposed by the package.

While the Implementation package provides a framework for the system of relief at source, there are a number of technology issues that need to be addressed before it can be adopted. For example, the system assumes a certain level of automatic exchange of information between intermediaries and tax authorities. Countries need to assure themselves that they can achieve the required level of exchange. Harmonization and standardization is required that will make the system economically viable for intermediaries.

In addition, the introduction of any new system requires governments to consider how they will review taxpayers' compliance with the system. While the Implementation Package addresses compliance issues, and includes reporting forms that would be used in that regard, these are necessarily based on a few countries' experience with similar systems. Because the system that would be adopted through the Implementation Package is not identical to any existing system, it is likely that both governments and business will want to continue to review these procedures during the process of implementation to ensure that they provide governments with the information that they need to review intermediaries' compliance without being more burdensome than is necessary.

3.6.3.6. Shareholder identification market practices

Securities issuers are keen to understand who their shareholders are. There are various reasons for this: to facilitate the communication with their shareholders; to understand significant shift in their shareholder basis composition and for legal reasons (e.g. if some ownership threshold must be disclosed or cannot be breached). Figure 20 below⁹² provides a high level description of how issuers obtain information on the balances of cross-border holdings and change in holdings of their shareholders.

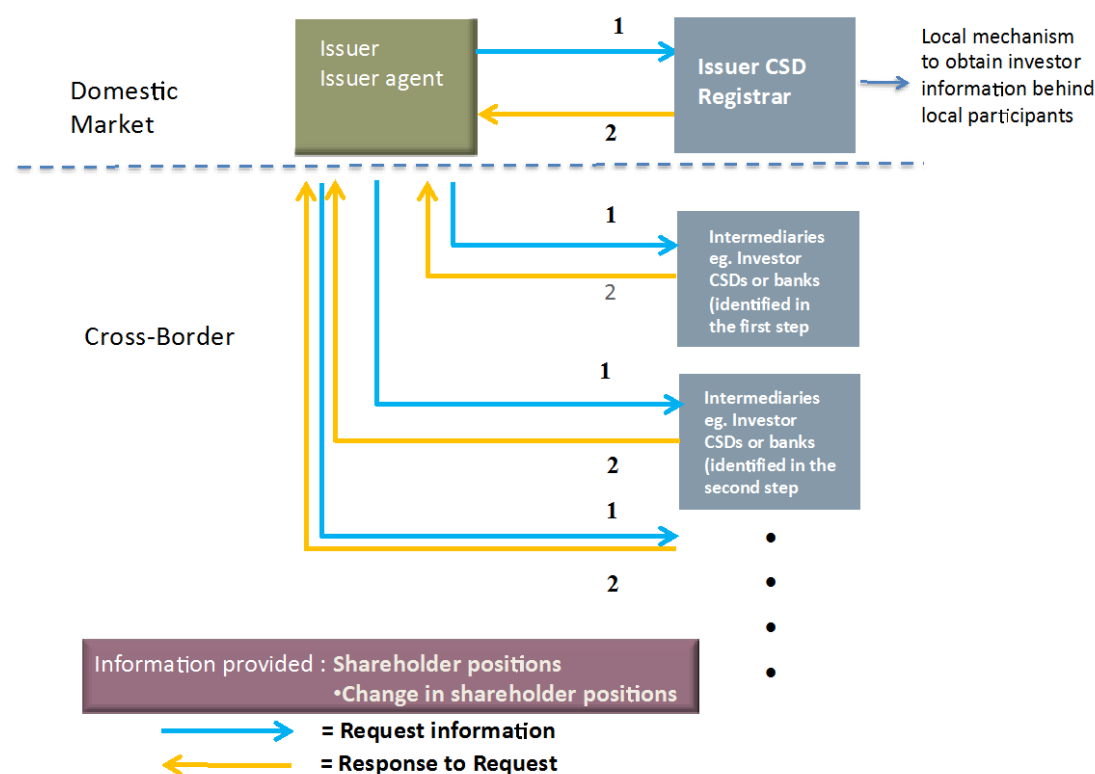
⁹² extract from T2S subgroup report on shareholder transparency:

https://www.ecb.europa.eu/paym/t2s/progress/pdf/subtrans/st_final_report_110307.pdf?dc403716f023aed5fd597fcb7d24ab2

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Figure 20: Shareholder identification: how an issuer obtain information on its shareholders



Source: T2S subgroup report on shareholder transparency.

The various steps are described below:

Step 1: As a first step, the issuer (or its agent⁹³) (i) in bearer markets requests its Issuer CSD or (ii) in registered markets consults its register (which may be operated by the Issuer CSD) in order to obtain a list of all the account holders having a position in the relevant ISINs. The information supplied would contain not only the names of the local participants and investors⁹⁴, but also foreign entities, such as Investor CSDs and foreign banks holding securities in accounts on behalf of themselves or their own clients. As already mentioned, this step (the domestic level) is efficient and automated and works rather well in most European markets.

Step 2: It is at the second step – when the process moves beyond this first layer of account holders – that the difficulties begin to emerge, particularly on a cross-border basis. For good governance, the issuer needs to be able to have the breakdown behind any omnibus accounts held in the issuer CSD. The issuer agent would therefore contact these account holders (e.g. investor CSDs or foreign custodian banks) and ask them to disclose the breakdown of holdings with their omnibus account. In theory, these account holders should then rather quickly reply to the request, providing the list of their clients holding the issuer’s securities. Among these clients, there may also be entities which are not the ultimate beneficial owners but intermediaries holding securities as nominees.

⁹³ The issuer agent is any entity which acts on behalf of the issuer. The agent could be a CSD, a registrar, an investors relations provider, etc. The issuer could even decide to in-source the role of issuer agent. For the purposes of this report, the term issuer agent is referred to in this generic sense.

⁹⁴ In many markets, the issuer agent has in place a mechanism to obtain information on the ultimate beneficial owners that are domestically located.

Step 3: In step 3, the issuer agent would then contact these entities identified in the second step as being nominees (assuming the holdings were sufficiently large) and request a further account breakdown.

Step 4: In step 4, the issuer agent would contact those nominees identified in the Step 3. And the process could continue further, with a Step 5 and so on, assuming the issuer is interested in finding out more information.

As soon as the process moves cross-border (potentially starting at Step 2 but could be at any step after step 1), issuers are faced with a number of challenges.

First, they are faced with legal obstacles. Foreign intermediaries may not be aware of the laws of another country that requires shareholder disclosure, and in any event may consider that their own local laws (e.g. on banking secrecy) might prohibit such disclosure. They may be uncertain as to whether they should first confirm with their clients before disclosing the information, which could then become a burdensome, inefficient and time-consuming process.

Second, even if the foreign intermediaries are allowed by law and willing to reply, they are faced with significant technical difficulties, due to non-standardised formats or communication processes (e.g. usage of faxes or letters) and non-harmonised market practices. The process is rarely automated.

As a result of the legal and technical difficulties, foreign intermediaries often do not reply or, if they do, reply with a significant delay, with incomplete information, or without using internationally recognized standards. Significant delays and poor quality, of course, reduce the value of the data for the issuer and the governance process for the investor.

3.6.3.7. General meeting market practices: description

The general meeting process is the process by which issuers invite their end investors / shareholders to participate and vote at their general meeting and by which shareholders/end investors exercise their rights to vote at the meeting. In order to be able to do this they need to prove to the issuer that they are shareholders.

At the high level the general meeting process entails four main steps:

- 1) The announcement of a general meeting and the distribution of the general meeting notice to shareholders/investors through the entire custody chain
- 2) The determination of entitlement for attendance and voting of the shareholders = end investors
- 3) The attendance of the general meeting by the end investor (in person, via proxy or via voting in advance)
- 4) The communication of the general meeting results to the shareholders / investors

Issuers interact with their shareholders for a general meeting through two different methods:

- The communication goes through the different steps in the custody chain: The bigger the number of intermediaries, the longer the communication of general meeting notice and the collection and reconciliation of shareholder votes.

Intermediaries in the custody chain often subcontract the process to proxy services providers who handle all the interaction between the issuers and their shareholders.

- End investors which are known to the issuer are informed directly about a general meeting directly by the issuer and can exercise their rights freely without being forced to ask for

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services of a service provider if they do not wish so. Under this method, communication between issuer and end investor takes place outside of the chain of custody.

This method only works if the issuer knows the identity and contact details of the end investor. With respect to voting and/or physical attendance at the general meeting, the issuer needs to have information as to the entitlement (i.e. the number of shares held as of record date) of the end investor.

Determination of entitlement

End investors / shareholders wishing to participate in general meeting have to prove to the issuer that they are indeed shareholders / end investors. In many countries the 'shareholder' is the person whose name is on the register and not the end-investor and this disharmony may cause problem (as highlighted in chapter 7 of the report).

As a general rule, voting entitlements are determined by the positions held by an investor at the end of day on the record date for a particular general meeting. There is no market claim process for voting entitlements.

In some cases, not all the positions that an investor holds as of record date are entitled. It may be case that some issuers require a special registration process in advance of record date. In such a case, there will be a discrepancy between the settled positions at the CSD as of close of business on record date, and the entitled positions.

This is easily done in case of registered shares by registration as a shareholder in the shareholders register of the issuer. In order to enable such direct exercise of voting rights the forwarding of the end investor = shareholder data is essential. In some member states the intermediary is registered as a shareholder and considered a shareholder that allows the issuer to accept votes cast by an intermediary as shareholders votes although this intermediary is not the end investor. The potential issue is that re-registration requirement may prevent end investor to sell his shares quickly, if need be, through his intermediary.

In case of bearer shares, the ownership of shares has to be evidenced by other means and most shareholdings are dematerialised this would normally mean certificate issued by the bank of the end investor.

Currently there is no standardised form of proof of entitlement which causes the risk that an issuer in one member state would not acknowledge the form of proof of entitlement issued in another member state as evidence for the ownership. In order to overcome those barriers standardised proof of entitlement, in particular for bearer shares, would be desirable. Also procedures are necessary to avoid over-voting; this can be achieved by procedures to identify which intermediary in a chain should issue the proof of entitlement, in order to avoid the risk that multiple proofs of entitlement are issued for the same securities position.

Participation in the General meeting

Shareholders have different possibilities to vote. In all cases they would need a proof of entitlement.

- The shareholders can send its voting instructions (electronically or by fax or via mail) to the issuer or the agent of the issuer handling the general meeting. Electronic voting (also called e-proxy voting) is more and more used, not only, obviously, by shareholders located far from the issuer domicile but also by shareholders located in the country of the issuer.
- The shareholder can decide to attend the general meeting in person. If he is an institutional investor, the person will usually be a representative of the institution.

- The shareholder may also decide to give a power to a person that will attend the general meeting in person and vote in the name of the shareholder.

Issues that might be analysed by the EPTF with regard to general meeting market practices:

The general meeting process as it is currently organised works better when the shareholder is located in the country of the issuer, but less well cross border. Institutional investors have several options for using services of intermediaries to exercise their participation. In 2009 the private sector has agreed upon General Meeting Standards (see 3.6.3.8 below).

End investors / shareholders still face barriers when wishing to fully exercise their rights they have paid for when buying a share. Participation and voting can be cumbersome for institutional investors. Some advanced company laws provide for special advantages for long term shareholders. To enjoy those benefits an end investor has to prove to the company to be a long term shareholder which is very cumbersome currently due to shareholder data not being forwarded from the end investor's bank to the issuer as necessary under applicable law. Also voting is jeopardised by some practical questions incl. the lack of a uniform proof of entitlement accepted in all member states, IT systems which are not state of the art used in the custody chain and by service providers.

Specific issues to be looked at:

- The positioning of the record date; a record date that is too far from the meeting date means that some entitled shareholders may already have sold their positions as of the meeting date; a record date that is too close to the meeting date means that some shareholders as of record date are not able to vote, and shareholders who can vote have to vote based on anticipated positions, so that (through no fault of their own) their vote may be invalid;
- The elimination of the practice of share blocking as required by the Shareholder Rights Directive;
- Establish a common form for proof of entitlement as the basis for voting by the end investor;
- Establish mandatory procedures for all intermediaries to forward the necessary data for registration of the end investor/shareholder as well as establish operational rules for intermediaries that de-registration is only effected in accordance with applicable company law and when shares are sold so reregistration does not occur, because such re-registration is not in accordance with applicable law and hinders efficiency;
- Facilitate the usage of electronic communication and electronic voting, where this is not used yet;
- End of the practice that investors cannot participate in general meeting in their own rights but have to be appointed as a representative of an intermediary;
- Harmonize the calculation of voting entitlement rules;
- Clarify and harmonize the entitlement rules related to shares on loan and shares used as collateral.

3.6.3.8. Market Standards for General Meetings⁹⁵

3.6.3.8.1. Objectives

The Market Standards for General Meetings (MSGM) have the objective to harmonise and streamline General Meeting related operational processes. They are part of the set of measures to remove the obstacles identified as Barrier 3 in the Giovannini Reports.

⁹⁵ <http://www.ebf-fbe.eu/uploads/Market%20Standards%20for%20General%20Meetings.pdf>

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Where direct communication between issuers and investors are not possible, the Market Standards for General Meetings aim at introducing streamlined communication and operational processes, based on a best practices approach, so as to ensure that information from the issuer can reach the end investor and vice versa in a timely and cost efficient manner.

By 2010 a cross sector working group, the Joint Working Group General Meetings, that is composed of representatives of all relevant constituencies i.e. the issuers, registrars, financial market infrastructures, banks and investors has developed market standards for the three processes Meeting Notice, Record date and Entitlement and Notification of Participation in the General Meeting. These standards have been agreed and endorsed by all relevant constituencies.

3.6.3.8.2. Components of standardisation

The Market Standards for General Meetings cover the following components, where applicable:

- Parties
- Content
- Messaging format
- Language
- Timelines
- Information flow

The three processes covered by the MSGM are

- Meeting Notice
- Record Date and Entitlement
- Notification of Participation.

3.6.3.8.3. Scope of application

The Market Standards for General Meetings apply to both domestic and cross border operational processes and therefore apply for communication with domestic and foreign end investors.

All types of General Meeting for bearer and registered shares are in scope that are (i) issued by an issuer with registered office in the European Union and traded on a regulated market in Europe, and (ii) held with an issuer CSD in Europe.

3.6.3.8.4. Covered processes

- Meeting Notice, i.e. the operational notice with the key elements of the convocation;
- Record date and entitlement, i.e. the date on which the rights of an end investor to participate and vote in a General Meeting will be determined on the basis of the shares held on that date;
- Notification of participation, i.e. the notice to inform the issuer whether or not the end investor will participate and vote at the General Meeting.

3.6.3.8.5. State of implementation

To implement the Market Standards for General Meetings, all European markets have set up National Market Implementation Groups. Their representatives are meeting in semi-annual (now annual) intervals at the workshops of the European Market Implementation Group (E-MIG) to monitor the progress of the implementation process.

The Market Standards for General Meetings were endorsed by all market participant groups. As of today they have not been fully implemented.

The facts found by the European Market Implementation group can be summarised as follows:

- Platforms for electronic messaging should be developed in more member states
- Implementation of GM standards in some member states may not be possible on a voluntary basis, but may need mandatory rules.

The main obstacles for full implementation have claimed to be:

- Sometimes contradictory, sometimes missing legal rules;
- Investment and cost of investment (priority for T2S and who covers cost);
- Lack of willingness to implement changes;
- Some Market Implementation Groups have decided not to promote standards;
- Demand of clients (on any level) may not be seen as high as to convince intermediaries of business case.

Implementation relies on the willingness of intermediaries to inform end investors about general meetings, the issuing of a proof of entitlement acceptable in all European member states and the empowerment of end investors to exercise their voting and other rights evidenced in shares. Currently private shareholders are almost never informed about general meetings of an issuer not domiciled in the home country of an end investor. There is no uniform proof of entitlement. It is very rare that intermediaries offer to private end investors means to participate in general meetings by proxy voting or direct electronic postal voting or issuing attendance cards. At the same time intermediaries do not forward end investor data which impedes registration of those end investors in case of registered share issuers so those end investors cannot vote easily.

Such services are more accessible to institutional investors. Most intermediaries use agents to provide these services to institutional investors.

3.6.3.8.6. Impact of amended Shareholder Rights Directive

The implementation of the Market Standards for General Meetings is significantly supported by the provisions of the amended Shareholder Rights Directive in regard of (i) transmission of information (Art 3b) and (ii) the facilitation of the exercise of shareholder rights (Art 3c).

3.6.4. Ancillary and value-added services market practices

Intermediaries that hold securities on behalf of investors typically also offer additional services, frequently termed ancillary or value added, that go beyond the core services relating directly to the safekeeping of securities, and to the exercise of rights deriving from ownership of securities.

Such services include inter alia foreign exchange services (that, for example, convert dividends paid in a foreign currency into the home currency of the investor), securities lending and collateral management services, as well as more administrative services such as investment reporting, performance management and fund accounting.

The provision by intermediaries of many of these administrative services represents a form of outsourcing by the investor to the intermediary. In the provision of these services, intermediaries benefit from economies of scale, as they can provide the same service to multiple investors, and from economies of scope as they already have access to data relating to the assets of the investor, and as they can capitalise on their operational capabilities in the administration of assets.

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Value added and ancillary services include inter alia investment reporting, performance measurement, collateral management, securities finance, fiduciary and trustee services.

3.6.5. Future trends

Increased automation at all levels of the custody chain will be possible as a result of ongoing harmonisation and standardisation of corporate actions processing and of General Meetings related services.

Due to its often inherent complexity, it remains to be seen to what extent new technologies, e.g. blockchain, will be able to support asset servicing.

Asset servicing related obligations of intermediaries in the amended Shareholder Rights Directive⁹⁶, i.e. end-to-end information between issuers and shareholders and facilitation of exercise of rights flowing from securities, have the potential to effectively support best market practices as per the Market Standards for Corporate Actions Processing and the Market Standards for General Meetings.

The progressive launch of the T2S platform might result in the progressive transformation of the custody chain in several ways:

- intermediaries may be tempted to open accounts directly with CSDs and by doing this disintermediating partially or totally sub-custodians;
- CSDs may be tempted to become investor CSDs, by opening accounts with issuer CSDs, and offering their services to their local constituency not only in their local securities but also in foreign securities. CSDs may face some challenges in developing such strategy as they are strongly regulated by CSDR. CSDR strongly limit the ability of CSDs to offer banking services. The provision of credits can only be offered if the exposure is fully collateralised. This limitation may prevent CSDs to act as withholding tax agent in some markets or to offer “contractual” income;
- The line that separates the CSD domain from the custodian domain will be more blurred than before.

3.6.6. Key findings

- Unresolved tax issues are a significant cost to cross border investments; the cost for withholding tax reclaim alone is estimated at approx. EUR 8.4 bn per year⁹⁷;
- Asset servicing per se is one of the most complex areas of post-trade. This intrinsic complexity is exacerbated in a cross border environment due to national diversities. Harmonising and standardising asset servicing processes is therefore key to improve efficiency and safety as the application of DLT is deemed unlikely in the short term;
- The provisions of the proposed amended Shareholder Rights Directive in regard of (i) end-to-end communication between shareholders and issuers and (ii) the facilitation of exercise of rights flowing from securities significantly support the successful implementation of market standards;
- Legal and operational diversities are the main causes of fragmented shareholder identification processes;

⁹⁶ See section 7.2.2 of the report.

⁹⁷ CEPS, Diego Valiante, Europe's Untapped Capital Market, 2016, p. 9.

- Coherent regulatory requirements in regard of asset / account segregation are of prime importance in particular for asset servicing;
- The general meeting process as it is currently organised works better when the shareholder is located in the country of the issuer, but less well cross border. Institutional investors have several options for using services of intermediaries to exercise their participation. Please refer to section 3.6.3.7 above.

3.7. Issuer Services

3.7.1. Description

Approximately 25% of the EU economy obtains financing through capital markets. Therefore, issuers use banks and other financial intermediaries for the various functions related to obtaining such financing. The services referred to as “issuer services” in this document comprise all services that banks, custodians and specialised services providers, usually names issuer agents, provide to issuers related to the admission of securities in CSDs and the subsequent services related to existing securities.

Issuer services, other than services related to bonds, include namely:

- Structuring corporate actions. Corporate actions are described on Section 3.6. above from the perspective of custodians having to process corporate actions. Issuers initiate the corporate actions and corporate actions structuring is a service provided to issuers with the objective of structuring the corporate action so that the issuer gets the best actions corresponding to its objectives. Issuers need to be supported in the preparation and the dissemination of the information and prospectus that describes the corporate action. Issuer agents connect issuers with the members of the custody chain to aggregate the results related to the shareholder’s decision, and to receive or delivers the aggregate results of corporate actions across several markets;
- Centralising information flows, securities deliveries and cash payments related to corporate actions;
- Maintaining shareholders registers;
- Managing employees savings plans, such as pension savings;
- Shareholder identification: organising the shareholder identification and providing the issuer with the centralised feedback of the identification process;
- General meetings: organising the general meetings, putting in place solutions for proxy voting and electronic voting;
- Transfer agency for depository receipts.

The corporate actions that issuer services providers provide to issuers include share splits, fusions, delisting, division of nominal value, capital increase, public offer to exchange, initial public offering, dividend payment. In the way they are structured and how custodians treat them, they are grouped together in 2 types of corporate actions: distributions and reorganisations.

The market standards for corporate actions and the market standards for general meetings apply also to issuers and issuer services providers typically act as issuer agents here.

3.7.2. Market Structure

The issuer services market is fragmented.

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Very often, custodian banks offer issuer services as a complement to their core custody functions, thus building upon a custodian network and financing capacities. Due to the increasing complexity of corporate actions and an increasingly international shareholder base, many services are provided by custodian banks that have a regional or global network. This also allows the offering of ever shorter deadlines for participation in general meetings. Holding cash accounts is a prerequisite for many issuer services, due to the cash leg that is involved.

Only one player has very large geographical coverage and covers a full range of services.

Other players are local only and non-banks. This is namely the case for employee pension saving schemes.

One characteristic of all these services is that they are still largely localised, i.e. close to the issuer that needs this services, even if the shareholder base is international. This is less true for services where shareholder input is required, such as General meetings.

In some jurisdictions, several custodians share a common platform for the processing of votes at a general meeting. This is for example the case in France, where a common platform called Vote Access allows for the processing of votes.

Importantly, in relation to the processing of votes, some service providers are specialised in proxy voting, whilst others provide both voting advice and proxy services and again others solicit investors to provide services and proxy voting. This is to be taken into account in the future Shareholders rights directive as currently under negotiation.

3.7.3. Future trends

Future trends can result from the atomised nature of issuer services, as each player is looking to provide services to an extended range of clients.

A certain movement of concentration is visible, for example with Computershare purchasing parts of businesses, such as Servizio Titoli.

Finally, new technologies might influence issuer service. Blockchain is under consideration although no concrete work case has been identified.

4. Investment Funds

4.1. Description

Investment funds are collective investment schemes and a specific subset of asset management which also include mandates and management of segregated accounts.

Fund investing involves:

- collecting money from different investors, both retail and institutional, and then
- combining the money collected and using it to purchase various investments, such as equities, bonds, negotiable debt instruments, derivatives, loans, unlisted stock, private equity, real estate and other tangible assets depending on the fund objectives and investment strategy.

The investment strategy may in certain cases involve leverage, depending on the funds' objectives and the targeted investor segment.

The main legal forms of organisation for investment funds are each one subject to dedicated regulation are:

1. UCITS Funds typically suitable for retail investors;
2. AIF (Alternative Investment Funds), typically targeted at institutional investors.

About 3 300 regulated asset management companies operate in Europe, employing 90 000 people directly and another 410 000 indirectly. Total AuM stood at: EUR 19 trillion at end 2014, and around EUR 21 trillion at end 2015. There were 30 000 UCITS and 27 600 AIF at the end of 2015 (EFAMA statistics, available at www.efama.org).

Regulated retail Investment funds (UCITS) offer the highest level of protection through a system of double authorization and supervision of both the fund management company and each fund, specific rules on the assets eligible for this type of funds in terms of nature and proportion in which they can be invested in; and supplemented by three layers of internal and external audit and depository controls. In addition, it should be kept in mind that the funds and asset managers operate within the framework laid out by market regulations (such as EMIR and MiFID2/MiFIR) and the management guidelines defined by the client or communicated to the clients at the fund's creation.

One key concern for EU asset managers is the ability to distribute their products cross-border within the EU and beyond internationally.

Overall, 57% of EU domiciled funds (UCITS and AIFs) are marketed on a cross-border basis. The EU has a successful track record of promoting the cross-border distribution of funds.

Firstly, since the UCITS Directive was released in 1985, licensed collective investment schemes benefit from a harmonized European marketing passport outside of their country of domicile. Since then, and following several legislative updates, the UCITS funds market has grown to €8 trillion assets under management. Around 80% of UCITS funds are marketed cross-border. However cross-border distribution remains limited:

- one third of UCITS that are marketed cross-border are sold in only one Member State in addition to their country of issuance (generally speaking, the Member State where the Asset Management Company is domiciled).
- Another third is not sold in more than four Member States outside of their home country.

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This is due in part to a combination of overall preference of local investors for domestic funds and still heterogeneous national regulatory and operational requirements which make cross-border distribution difficult across the EU. Functioning of the passport and cost of its effective implementation do not seem to impede effective cross-border distributions of EU investment funds⁹⁸.

Secondly and more recently, the Alternative Investment Fund Managers Directive (AIFMD) introduced an EU passport for institutional investors in AIFs. There are currently about €5 trillion of assets under management in the AIF segment, with 40% of funds marketed across border. AIFs which are managed by authorised AIFM should, in accordance with that Directive, be freely available for sale to professional investors in the European Union, and also to retail investors if the home and host countries so allow, for example in the case of real estate investing AIFs suitable to retail investors.

Where EU funds using the marketing passport are sold to retail investors, host Member States sometimes introduce special administrative arrangements intended to make it easier for investors to subscribe, redeem and receive income payments from those funds, as well as to receive tailored information to support them in doing so. These additional requirements, and are questioned by the EU Commission⁹⁹.

4.2. Market Structure

Investment funds and asset managers are part of the so-called buy-side of wholesale financial services. They are users of the post trading market infrastructure rather than providers of post-trade services. The investment fund market in Europe is rather fragmented in terms of trade and post-trade operational models. However, the value chain of fund investing (subscription/redemption and occasionally secondary market trading of fund shares; and settlement, custody and asset servicing usually works very efficiently in local markets in the EU and for most local funds. Problems usually arise in the area of cross-border distribution of funds. The two main issuance markets for most cross-border UCITS and AIFs are Luxembourg and Ireland. There are a few dominant order routing platforms supporting cross-border funds distribution, operated by CSDs or International CSDs, but there are third party-operated solutions as well. Some stock exchanges are also launching new services to route and manage funds primary orders.

Specific local distribution requirements may hinder efficient cross-border distribution and fund asset servicing, such as intermediary (payment and tax agents), regulatory or tax notification requirements and local marketing requirements. In France there is now a call for fund orders to be routed directly to the fund TA in addition to the customary CSD registration process.

4.2.1. Service providers

Investment funds may delegate primary market and issuing functions to Transfer Agents (TA) or Issuing Agents (IA).

⁹⁸ See the recent Autorité des Marchés Financiers study on “Cross-border distribution of funds in Europe: identify the real barriers and enhance investors' confidence” available at:

http://www.amf-france.org/en_US/Reglementation/Dossiers-thematiques/Marches/Union-des-marches-de-capitaux/Dans-quelle-mesure-existe-t-il-des-barrieres-a-l-entree-pour-les-fonds-Europeens-.html#title_paragraph_0

⁹⁹ Consultation document: CMU action on cross-border distribution of funds (UCITS, AIF, ELTIF, EUVECA AND EUSEF) across the EU. Available at: http://ec.europa.eu/finance/consultations/2016/cross-borders-investment-funds/docs/consultation-document_en.pdf

This function may also sit with the asset manager, a depository bank or another specialised third party provider, usually a custodian bank.

Traditional markets where a dedicated service provider performs this function, the so-called Transfer Agent (TA), are amongst others the UK and Ireland. In France and Germany this function is normally performed by the custodian, acting also as Issuing Agent for the shares in the national and cross-border CSD's.

The TA activity consists of:

- Issuing and redeeming fund units and maintaining the capital issued by the fund on each dealing day (TA+IA)
- Collecting and executing all primary market orders (subscriptions, redemptions, reinvestments, and switches) (TA)
- Acting as settlement agent via CSD/ICSD delivery versus payment (DVP) instructions or receiving/paying the transaction amount and booking the related units in the fund register (TA+IA)
- Maintaining the official register, if any (TA; IA), i.e.
 - Performing AML and KYC processes
 - Maintaining shareholders register accounts and details (TA)
 - Keeping shareholders positions
 - Reporting related transactions and position statements
- Announcing and processing corporate actions and dividend payments (TA+IA)
- Calculating and instructing payment of rebates to distributors (TA).

The custodial activity consists of:

- Keeping fund assets in funds' accounts;
- Settling fund transactions related to these assets;
- Receiving or paying the global amount for each collect, in line with the total number of units issued/redeemed for each dealing day.

The administrator and accountant functions are to:

- record any transactions related to the fund's assets;
- record fund's assets positions
- record the new capital and related cash for each dealing date forward settlement/delivery instructions to the depository agent;
- reconcile fund portfolio with the assets held with the custodian

calculate the fund's Net Active Value (NAV) for each dealing date.

The depository's key functions are to¹⁰⁰:

- Safekeeping of assets of the fund not its fund units
- Oversight of the management company and of the fund
- provide settlement, custody and asset servicing for the fund's underlying assets;
- ensure that the underlying portfolio of each fund conforms to the fund's investment strategy and investment restrictions, as outlined in the prospectus
- monitor the correct handling of all cash movements affecting the fund

¹⁰⁰ See for example the description of function in Recital 12 of Directive 2014/91/dated 23 July 2014 amending Directive 2009/65/EC as regards depository functions, remuneration policies and sanctions.

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A full list of the legal tasks of the depository can be found in the AIFM/UCITS Directive¹⁰¹.

There are no pan-European data available on the number of usually credit institutions engaged in transfer agency and fund depository activities. A recent press article seems to suggest that in the two largest fund domiciles in Europe there are 66 custodians servicing local funds in Luxembourg and 17 doing the same in Ireland in 2015. At the end of 2015 there were also 114 fund administrators in Luxembourg and 42 in Ireland (source: Ed Mossion, Lux administrators rising, Irish custodians falling, Ignites Europe, 25 August 2016). According to BVI/Praxisforum Depotbank Statistics (available at www.bvi.de) there are per end of 2015 44 depository banks active in the market which by law also provide the TA functions on German based investment funds. Looking at a list of members of the UK's Depository and Trustee Association is that there are at least 9 companies active in the UK which are authorised by the FCA to act as depositaries for both UCITS and AIFs. And there are at least another 12 which can act for AIFs only¹⁰².

4.2.2. Order-routing and Settlement platforms

Investment funds are ultimately subscribed to or redeemed via the Transfer Agent or the Issuing Agent appointed by the fund. Usually, an order from the ultimate beneficial owner received at the TA or Issuing Agent flows through a chain of intermediaries, such as order-routing and settlement platforms, which give the investor or his/her bank or brokers centralized access to a multitude of fund transfer agents. The European fund market including its order routing systems is fragmented. The fragmentation is costly for fund management companies in Europe, as each platform requires an on-boarding and regular static data deliveries. This increases the cost of distribution while not yielding a benefit for the end investor. Some order routing platforms have emerged, however there is room for further standardization.

An important aspect goes beyond the pure operational centralization of the order-routing and settlement layer. Due to different remuneration practices in Europe, many platforms are being paid for by the fund managers. To the extent that retrocession based remuneration schemes include investment advice they may not be appropriate for the payment of pure operational work performed by the platforms which give no advice to clients. A review of the platform set-up in Europe and appropriate actions resulting from it could significantly support the growth of infrastructure initiatives in Europe like T2S, as well as their further development.

4.2.3. Subscription/Redemption, Settlement and Transfer of Investment Funds

The Open-ended investment fund (in case of contractual type funds, e.g. Trusts, FCPs or "Sondervermögen" in Germany) or fund shares (in case of company type funds, e.g. Open Ended Investment Company (OEIC), Investment-AG, SICAV) differs from other financial instruments. The key differences are that funds units or shares are issued or redeemed continuously during the lifetime of the fund, and subscriptions or redemptions do not always settle at a CSD. There are currently two ways to process subscription/redemption for funds: the "Transfer Agent Model" and the "CSD model". The difference is important for open-ended investment funds as they are distributed globally. To suit global distribution it is important to cater for all clients and not only to watch regional specificities, e.g. T+2 settlement in Europe. Furthermore, depending on the underlying, funds may not be able to price daily, leading to different valuation and settlement times. Transfers are executed in many different ways today, and it is a challenge for custodians to operate

¹⁰¹ AIFMD: Article 21 paras 7-10; UCITS Directive: Article 23 paras 3-6.

¹⁰² Source: <http://www.datasoc.co.uk/about/data-members.html>

in such a fragmented and non-standardised environment. Transfers of fund holding free of payment cause specific problems, in particular so-called “single leg” transfers. In the flow of single-leg transfer messages, one party on the transferee side will send its instruction, potentially with details such as settlement parties and/or so-called agent codes (commercial contract references defining rebates, commissions etc), to the transferor. Increasingly, market participants see the need for contractual terms governing this instruction, meaning that the transferee and transferor will have a way to hold each other liable for such things as service levels, introduction of errors in the instruction data, breach of confidentiality, etc. If the transferee and transferor never executed such a transaction before, they will at least have to agree on a protocol and establish some method of authentication of the instruction as well as acceptance tests with their counterparties. Near the end of the process, the transferee will have shares in its account without having provided their direct and explicit instruction to the TA. For many account owners, it may be unacceptable from regulatory compliance and risk management perspectives to knowingly accept that the TA can credit their register account without any form of contract. For the single-leg transfer method to gain acceptance, the parties involved will require that some kind of governing framework is established. In the UK this has been accomplished by the establishment of a TISA exchange, a contract club¹⁰³.

4.2.3.1. Transfer Agent Function

The Transfer Agent function is further divided into three types of settlement processes depending on the chosen distribution model for the fund:

- Direct settlement with the TA
- Settlement via a TA and an International CSD
- Domestic settlement via a TA and a CSD

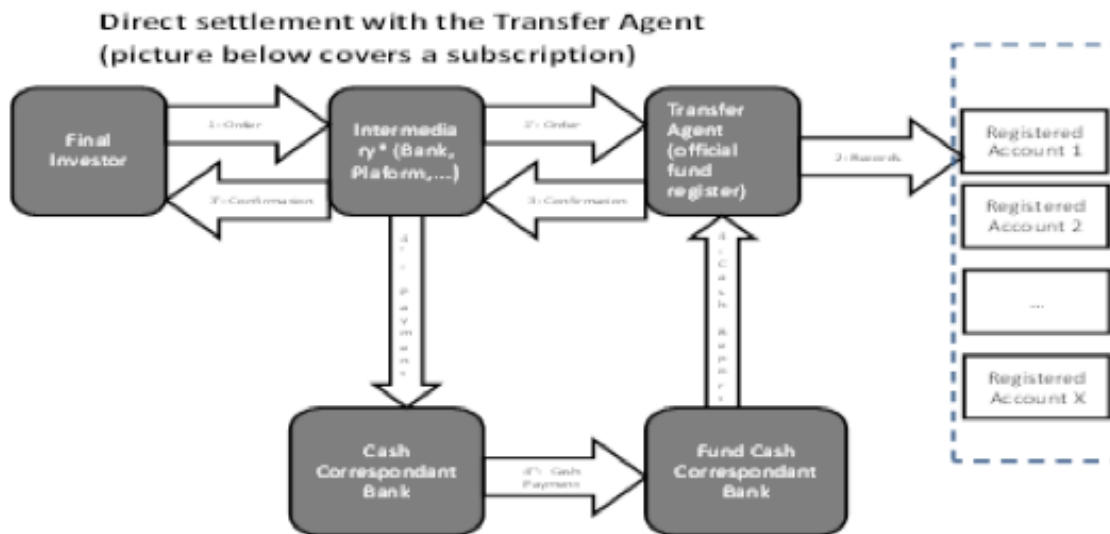
4.2.3.1.1. Direct settlement with the TA

Settlement is processed directly with the Transfer Agent that records the name of the investor in the fund register. This record is based on the order received from the “order originator” and it generates a confirmation to the order originator and a payment report to the correspondent bank managing the cash account of the fund. The originator then has to process a payment transfer (commercial bank money) via its cash correspondent bank to the fund's designated cash correspondent bank. This is the most widely used model for the settlement of funds in Luxemburg and Ireland.

The fund register is the ultimate reference in terms of record of holding in the fund and its total outstanding shares. It is a very flexible model open to any type of counterparty (banks, funds of funds, platforms, institutional investors, retail investors...). It enables compliance with local AML and KYC rules and supports a multi-currency environment as it is a commercial bank money based model. At the same time the register model does not offer a secure “DVP” mechanism for exchange of units and cash, as with the CSD model.

¹⁰³ <http://www.tisaexchange.co.uk/>

Figure 21: Direct Settlement with Transfer Agent



*There can be various intermediaries in the order chain

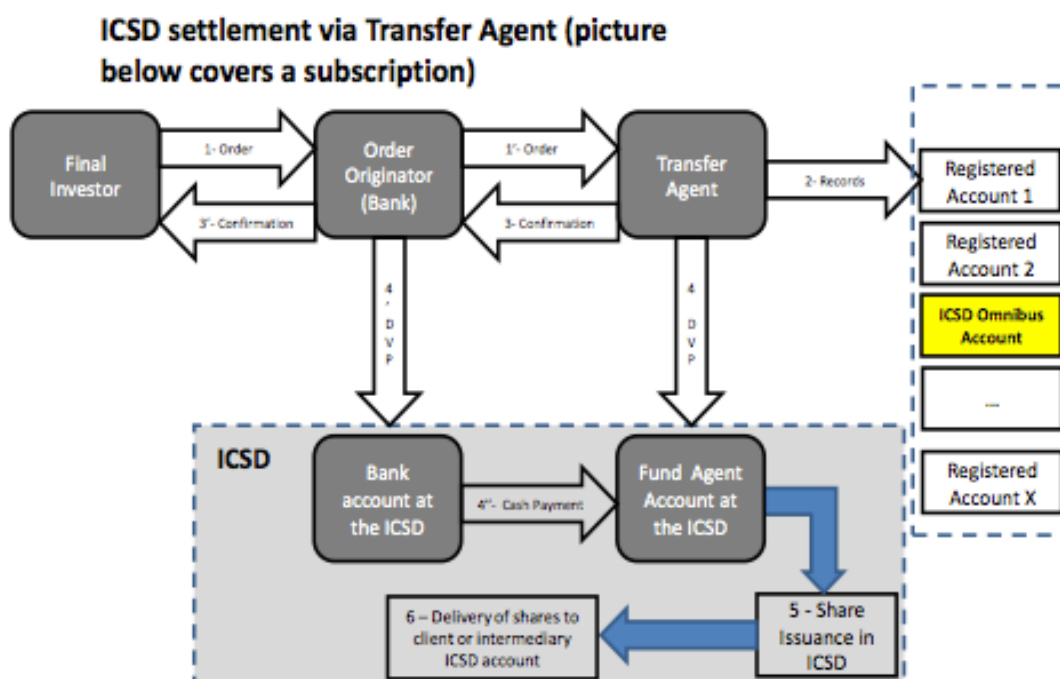
Source: EFAMA.

4.2.3.1.2. Settlement via a Transfer Agent and an International CSD

This model differs from the previous one in that the fund maintains an account in the books of an ICSD and the Transfer Agent sends instructions" versus payment" to create the securities in the books of the ICSD. The newly created position is reflected in the register of the Fund in an omnibus account in name of the ICSD.

This model is mainly a cross-border model with banking counterparties and standard settlement and order cycles. The fund register remains the ultimate reference in terms of record and of total number of shares issued.

Figure 22: ICSD Settlement via Transfer Agent

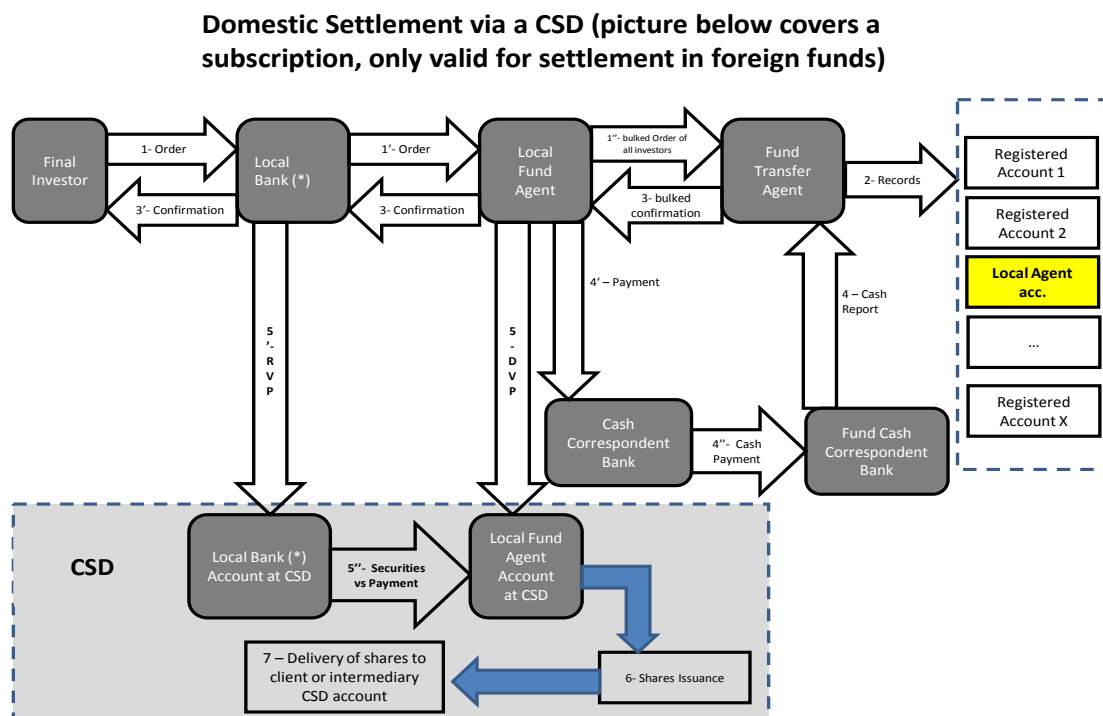


Source: EFAMA.

4.2.3.1.3. Domestic settlement via a TA and a CSD

This model is mainly used to settle cross border TA model funds (from Luxembourg for example) in Germany and France where settlements are processed via domestic CSD and between domestic counterparties. It requires the involvement of local "sub"-Transfer Agent in the respective country. The fund register remains the ultimate reference in terms of record of shareholders and of the total number of shares issued. It is a single currency, central bank money based model. Settlement at CSD level can be only processed via its participating banks.

Figure 23: Domestic settlement via a TA and a CSD



Source: EFAMA.

CSD Models

This model differs from the Transfer Agent (TA) Model by making issuance of funds in the CSD or funds CSD-eligible, thus enabling fund shares to settle through the settlement engine of the CSD in the same way as equities, i.e. by using a delivery versus payment process.

The CSD model is further divided into three types of settlement processes:

- Direct settlement with the TA in the CSD
- Settlement with the CSD from an International CSD
- Settlement with the CSD from another CSD

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4.2.3.2. Direct settlement with the TA in the CSD

Fund orders are placed by investors via their custodians. The custodian has direct (sometimes an indirect) access to the CSD, or to an order routing platform. The fund transfer agent acts as a “centralizing” agent in the CSD. Upon completion of the settlement process, the fund shares are registered in the investor’s account in the books of his or her custodian that in turn maintains an account in the CSD. The end investor may be separated from the CSD by several intermediary layers.

The principles of the CSD model imply STP processes and secure delivery/receipt versus central bank money payment. The shares are created at CSD level in fully or partially dematerialized form.

This is the most widely used model for the settlement of funds in France, Germany and Netherland.

4.2.3.2.1. Settlement with the TA from an international CSD

Custodian having an account with an international CSD can also route orders to the fund transfer agent through the international CSD fund routing platform.

The settlement of those orders can be done through an STP delivery receipt versus payment through the link between the International CSD and the CSD of the fund.

4.2.3.2.2. Settlement with the TA from other CSD

Custodian having an account with another CSD can also route orders to the fund transfer agent through the CSD fund routing platform or directly to the fund transfer agent.

The settlement of these orders can be done through an STP delivery receipt versus payment through the link between this CSD and the CSD of the fund.

Depending on the local market environment there may be different order placement methods. For example, the French market knows two variations: Under the commonly used “direct order method”, the asset manager signs - on behalf of the fund - an agreement with the transfer agent authorizing the transfer agent to accept investors' subscriptions. Thus investors are able to send “direct orders” to the fund's designated transfer agent.

- Under the traditional model, subscription/redemption orders must be transmitted to banking institutions which are EOC France members. The asset manager appoints a “centralising agent” (actually the TA of the fund) which is also a participant of EOC France and is in charge of collecting all orders from other banking institutions, for each dealing day. The collect is then transmitted to EOC France which issues / liquidates the number of units required and updates accordingly the fund’s register.
- Under the alternative “direct order method”, the asset manager signs - on behalf of the fund - an agreement with the centralising agent / transfer agent authorizing the transfer agent to accept investors' subscriptions and redemptions. Thus investors are able to send “direct orders” to the fund's designated transfer agent instead of going through a banking institution where they (or their distributors) have open a banking account. The settlement of these orders can be done through an STP delivery receipt versus central bank money payment, or via a payment in commercial money and the booking of the units in the fund register.

Under the less commonly used “registrar method”, a register is managed by the asset management company (which is liable for performing KYC /AML checks on investors). Maintenance of the register can be delegated to a custodian. This model is mainly used by private equity funds, real estate funds, and various special purpose and closed-end.

The principles of the CSD model imply STP processes and secure delivery/receipt versus central bank money payment. The shares are created at CSD level in fully or partially dematerialized form.

4.2.4. T2S and Funds

TARGET2 -Securities (T2S) is expected to be a game changer by increasing competition within the fragmented European securities market. With 24 CSDs participating in T2S the potential of harmonization and standardization is significant.

T2S is run by the European Central Bank and participating national central banks. T2S-eligible securities include investment funds. This will enable investors, distributors, asset managers and other service providers alike to benefit from a secure and efficient way of cross border settlement by using highly scalable and automated processes. Even when T2S starts only with Euro, and the Danish Krone being added in 2018, the system can handle all currencies. T2S also facilitates multiple settlement time windows, which is a prerequisite for investment funds, particularly considering cross-border funds distribution into investment markets outside the European time zones.

One less welcome aspect is the reduced transparency of “who owns what”, caused by the fact that a vast majority of T2S accounts are omnibus accounts. Since however T2S is only a settlement platform and not an end-client custody system, solutions to address this issue exist.

For example, each transaction can be tagged or “ear-marked”, with information enabling the fund company to identify the order originator. Earmarking would also allow the TA, or the centralising agent of the fund, to perform ex-ante controls on each transaction. As an illustration in France, a distributors’ referential called “BIC1” – an approved SWIFT and EFAMA standard- lists around 2 000 distributors across Europe with proven efficiency (98.9% of orders are earmarked). Such a market referential may be envisaged for the broader scale of T2S in case of subscriptions, redemptions or switches.

Currently, transfer of shares between CSD accounts are not reported ex-ante to the fund or its centralising agent. The existing process – a periodic reconciliation with positions held in the CSDs’ books – enables ex-post position adjustment. Extending the ear-marking to transfers could be an option worth investigating to create conditions for efficient distribution oversight within T2S. However, even complete “ear marking” of both transactions and transfers does not relieve the fund of the need to reconcile movements and positions to allow correct calculation of distributor fees.

An additional point where T2S can be leveraged for the benefit of more efficient capital markets and truly causing downstream harmonisation, is the local market centralizing agent requirement in Europe. With T2S, the fund could need to appoint a T2S centralising agent to replace progressively the local centralizing agents. The T2S centralising agent will collect orders and manage the sub-issuing account in the T2S environment. In order to simplify distribution oversight and reduce registration costs, in some cases, the central administrator may take the role of the T2S centralising agent.

4.2.5. Exchange Traded Funds (ETF)

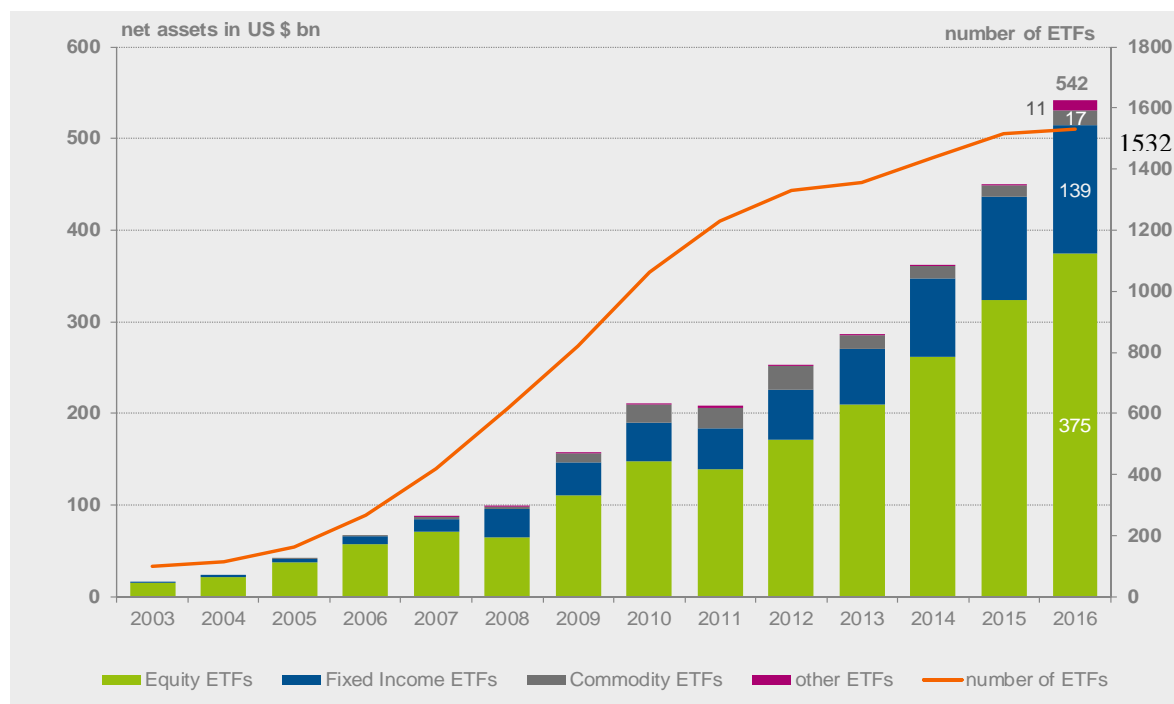
Besides the classic, actively managed investment funds there is an increasing number of funds which are listed on stock exchanges, which often track indices, and whose main form of trading occurs in the secondary market, the so-called Exchange Traded Funds or ETFs.

The following figure shows the increasing relevance of ETFs within the EU. ETFs count for app. 5% of the EU UCTIS AUM at the end of 2015.

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4. Investment Funds

Figure 24: Evolution of Assets and Number of European ETF



NB: Assets in Million US\$ (left hand –scale) Number of ETFs (right hand scale).

Source: Deutsche Bank, European Monthly ETF Market Review.

Because of their dual nature as investment funds and at the same time exchange-listed securities, ETF face special issues on the issuance, operations, and liquidity management side.

Assets under management in European ETFs have more than doubled over the last five years to reach over \$450 billion at the end of July 2016. ETFs represent 5.5% of the total investment fund assets in Europe. This compares with 12% in the US market. The European ETF market remains highly concentrated, with the top three providers managing more than two thirds of the assets. The need for innovation and product differentiation has increased. Recent examples of offerings include currency-hedged and strategic beta ETFs. There are physical replication and synthetic (per swap) replication methods to build an ETF portfolio. In both styles portfolio management uses highly automated processes.

AETF producers rely on sophisticated IT solutions for the day-to-day portfolio building and risk-management tasks. When a physically replicating ETF wants to create new shares of its fund, whether to launch a new product or meet increasing market demand, it turns to a designated market maker or Authorized Participant (AP). It is the AP's job to acquire the securities that the ETF wants to hold. For instance, if an ETF is designed to track the XYZ 50 Index, the AP will buy shares in all the index constituents in the exact same weight as represented in the index, then deliver those shares to the ETF. In exchange, the ETF gives the AP a block of equally valued ETF shares, called a creation unit. The exchange takes place on a one-for-one, market-value basis: The AP delivers a certain amount of underlying securities and receives in subscription the exact same value in ETF shares, priced based on their net asset value (NAV), and on not the market value at which the ETF happens to be trading.

The process also works in reverse. APs can remove ETF shares from the market by purchasing enough of those shares to form a creation unit and then delivering those shares (redemption) to the ETF issuer. In exchange, APs receive the same value in the underlying securities of the fund.

On the issuance side, cross border distributed and traded ETFs face legal issues because of

- the need for additional fund certificates to enter the CSDs (e.g. in Germany); or
- the need to appoint additional intermediaries to be able to function in certain markets (e.g. for the maintenance of the beneficial owner record in Spain). Operations of ETF may be facilitated with:
 - further standardization of the life cycle from primary issuance (preferably with one issuance process covering multiple cross-listings), to secondary market (CCP flows, settlement discipline);
 - the complex realignment from primary issuance to secondary market (e.g. Germany and UK);
 - asset servicing issues (e.g. application of the EU Market Standards for Corporate Actions Processing).

More and more ETFs have a single issuance in a CSD or an International CSD. The ETF units can:

- circulate cross-border leveraging on the links between their issuing CSD and the international CSDs or the other CSDs;
- be listed in several stock exchange.

Finally, ETF could add to market liquidity with increased participation in securities lending markets.

An industry working group is currently developing proposed solutions to these operational issues, which should be available by the end of 2016¹⁰⁴.

4.2.6. Closed-end funds

Closed-end and private funds organised as private partnerships, trusts or similar entities form an important part of the AIF universe in Europe. These include for example hedge, private equity and many real estate investment vehicles. They are often sold only to a limited number of investors and are highly customized, which poses challenges to including them in automated issuance, trading, clearing and settlement processes. A notable exception is the UK Investment Trust which is a listed stock corporation investing in securities; which trades and settles like other equity securities.

4.3. Market Practice¹⁰⁵

The European cross-border funds processing landscape is still presents a medium to high level of fragmentation at both trading and post-trading levels, resulting in potential cost and risks while ensuring protection of local investors to some extent. As described above, there is no such thing as a pan-European funds execution and processing life-cycle, as investment funds are processed according to a mix of home and host state rules, nor are there true European asset managers or true European funds as both are registered and follow the rules of their home state.

¹⁰⁴ AFME Joint Working Group ETF Processing Standard (add reference)

¹⁰⁵ This description is based largely on EFAMA Standardization of Fund Processing in Europe Reports 2011, 2008, and 2005, for details, please see: <https://www.efama.org/Lists/Topics/form/DispItem.aspx?ID=16>

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In the current funds market, the bulk of the volumes continue to be distributed in domestic markets (funds sold in the country of issuance) and are largely processed through domestic market infrastructures which are different from one market to another. Execution of fund orders and initiation of settlement processes may also still be manual and different between domestic markets.

Proprietary fund orders are largely processed through the issuing banks' in-house proprietary systems and procedures which may differ from one firm to another.

There are however, increasing order volumes executed in fund hub markets with distribution outside the country of issuance and processed through cross-border market infrastructures. A few large infrastructure players offer distinct fund transaction services and infrastructure components along the processing value chain to support both domestic market and cross-border distribution (e.g. FundSettle by Euroclear and Vestima by Clearstream, Calastone, Allfunds).

Fragmentation is also inherent in of communication standards, distribution channels and interfaces (e.g. different times for fund valuation in a market day, different number of decimals used for unit/share valuation, different settlement schedules, different policies regarding how public holidays impact the valuation of funds, etc.).

Progress towards a truly integrated and flexible European infrastructure model for fund features, for transaction and back office processing of investment funds does require close cooperation among market players and where necessary, public action. The buy-side industry, as represented by EFAMA has acted as a catalyst to promote industry-wide coordination. Its Fund Processing Standardization Group (FPSG), aims at identifying obstacles to efficiency in back-office procedures and outlining possible actions to remove them. Recent EFAMA FPSG initiatives include the following.

4.3.1. EFAMA Fund Processing Standardization Reports

The FPSG released its first report with recommendations covering the order and settlement processes in 2005. Since then, the FPSG report has been updated twice, first in September 2008 to add sections covering holding and transaction reporting and commission reporting, and in March 2011 to include further sections on transfers of titles and corporate actions¹⁰⁶. The following recommendations illustrate the spirit and types of issues and solutions identified by the FPSG:

- Whenever possible communications between industry players should be electronic and use ISO standard identifiers, such as BICs and ISINs.
- Using proprietary communications protocols which are rarely standardised should be avoided. Instead the ISO 20022 standard should become the basis for electronic communications between fund managers, transfer agents, distributors and other actors in the fund industry.
- Transfers of title to fund units should be processed electronically whenever possible, following a standardized process to ensure that all parties involved act according to an agreed sequence of actions.
- The actor that calculates and pays commissions, needs to be provided with the information needed to make the payment and advice the distributor accordingly in a timely fashion.
- Corporate actions and events requiring investors to be notified should follow a standardized process and timeline and be broadcast to the wider market.

¹⁰⁶ See http://www.efama.org/index.php?option=com_docman&task=doc_download&gid=1379

Bearing in mind the significant potential cost savings that could be achieved through standardization and automation, much has been done to promote the agreed standards within and beyond the fund industry: national associations and other bodies created dedicated working groups and spread the word through their websites, press articles, conferences participations, infrastructure providers have developed business cases and solutions, fund managers and transfer agents have substantially invested in their core systems and launch automation campaigns towards the distributors community, all to improve straight-through-processing rates across order and settlement activities.

For example, the Luxembourg fund association ALFI created a report on T2S fund related issues¹⁰⁷. The Italian market nudged by the local regulator established an industry wide move to ISO 20022 based fund processing covering today 58% of AUM of Italian domiciled funds and 80% of AUM of foreign domiciled fund flows. In 2015, 42% of order messages for Italian domiciled funds and 18% of foreign domiciled funds were exchanged via ISO 20022 messages¹⁰⁸.

In the area of alternative funds there have been ISO 20022 based initiatives, namely SHARPE and Global Alternative Investment Automation (GAIA)¹⁰⁹. The latter was formed in August 2014 and consists of seven leading alternative fund administrators, custodians and infrastructures. The group aims to bring automation and best practices to operational messaging flows within the global alternative investment industry. Until now, these processes relied on faxes or other manual methods. The initiative is working in close coordination with ISO and SMPG which aim at integrating specific process requirements of alternative funds into the ISO 20022 message offering for traditional investment funds.

4.3.2. Tracking industry progress: EFAMA/SWIFT Report: Fund Processing Standardisation

EFAMA and SWIFT jointly publish on a bi-yearly¹¹⁰ basis trends in standardisation and automation rates of fund orders received by transfer agents in Luxembourg and Ireland. These reports are available on both EFAMA and SWIFT websites¹¹¹ evidencing progress from May 2009 to today.

The value of the periodical reports are increased with ad-hoc country reports, e.g. a report on Italy in 2014 and on Germany in 2016. The goal of this initiative is to inform all stakeholders within funds processing, but also the European Commission, the European Parliament and other interested parties about the industry's progress.

¹⁰⁷ <http://www.alfi.lu/node/3034>

¹⁰⁸ <http://www.assogestioni.it/index.cfm/1.135.0.49.html/standardizzazione-operativita-fondi>

¹⁰⁹ <http://www.gaiastandard.org/>

¹¹⁰ EFAMA and SWIFT publish two fund processing standardisation reports per year: a full year detailed report and a mid- year update report.

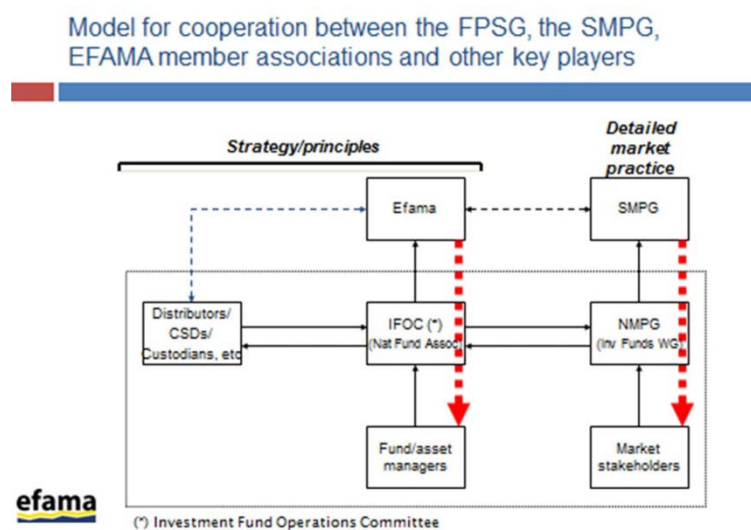
¹¹¹ <http://www.swift.com/funds>

http://www.efama.org/index.php?option=com_docman&task=cat_view&gid=88&Itemid=-99

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4. Investment Funds

Figure 25: Model for cooperation to establish report standard



Source: EFAMA Fund Processing Standardization Report 2011, p.31.

4.3.3. Securities Market Practice Group

The Securities Market Practice Group (SMPG) was established in July 1998 with a focus on defining market practices for the securities industry based on existing ISO messages for Trade Initiation/Confirmation, Settlements, Reconciliation and Corporate Actions. SMPG's goal is to provide the community of ISO 15022 and ISO 20022 securities message users with a global market practice on the usage of these messages. SMPG has produced over 30 market practice recommendations using ISO 15022 messages. SMPG has since expanded to define market practices for the Investment Funds industry using the ISO 20022 messages. All market practices are available on www.smpg.info. SMPG is open to all securities players – through participation in a National Market Practice Group (NMPG) – interested in creating globally-agreed market practices for the securities industry. NMPGs are established in about 40 countries. SMPG is a non-funded industry group that only functions thanks to the dedication and assistance of the local experts active in the NMPGs.

The activities of the investment fund WG at both NMPG and SMPG level include the all ISO 20022 fund message areas, for details please see: http://www.iso20022.org/securities_messages page (under “Investment Funds”).

4.3.4. Data Transparency

In order to reach more investors, while simplifying the operating model, the fund industry has seen the increasing importance of intermediaries, such as platforms, custodians or ICSDs, who collect orders, and centralize these in an omnibus account opened at the TA. There is likely to be a chain of omnibus accounts throughout the distribution down to the ultimate beneficial owner of the fund units. Therefore the identification of the investor or the full distributor chain is very challenging. Without full information, instances of mis-selling and allowing non-eligible investors to participate in a fund cannot be excluded. Funds attempt increasingly to perform ex-ante controls focusing on the identification of the order giver (e.g. investor/ distributor/ intermediary) for orders and transfers. For this purpose, order-marking models are deployed in the funds industry. Given the increased importance of both knowing your customer (KYC) and your distributor (KYD)

requirements under various pieces of market and tax regulation) there is a need for introducing common standards in these areas:

- Compliance with regulation (e.g. AML/KYC checks);
- Client eligibility (e.g. client acceptance, investment restriction, compliance with local sales and marketing rules);
- Suitability (e.g. information on investors, suitability and appropriateness checks);
- Transparency and fairness of remuneration schemes for distributors;
- Facilitation of product choice and monitoring product quality.

4.3.5. Static transaction data platforms and standards

In 2011, EFAMA laid the foundation for a fund specific static data standard with the Fund Processing Passport (FPP) initiative which is supported by a number of data platforms in half a dozen EU countries that collect FPPs on thousands of funds. The FPP is a document to summarize, at class level, in the form of 100+ data fields the essential information on investment funds that should be provided by the fund provider in order to facilitate funds processing. For details see: *Standardization of Funds Processing in Europe: Order and Settlement – A Report from EFAMA’s Fund Processing Standardization Group*, dd. March 2011.

At the moment there is beyond the limited scope of the FPP no common market standard for fund static data. Various initiatives and providers are active in this space with different commercial interests and agendas resulting, in spite of best efforts, in poor data quality not the least because of lack of a common language to describe funds. Data need to be reconciled with various different provider formats at all stages of the value chain. Currently fund managers cannot easily take on the responsibility as a “golden source” for their fund data as they are usually collected and prepared by different providers. Work on a European standard for fund static data, the data models as well as the data transfer is progressing slowly by various initiatives, e.g. funds XML.org. The ISO 20022 data model and dictionary provides a good starting point for a static data standard because of its use in the transaction space.

4.4. Future Trends

The future European transaction processing landscape for funds may be one with:

- a small number of infrastructure providers (but not one single provider);
- a European funds processing model that offers flexibility across the key dimensions (local market practices, infrastructures, regulatory/legal and tax regimes; interfaces; distribution channels). Flexibility should enable the future European fund transaction processing landscape to create value through connecting and leveraging existing custody and settlement infrastructures and by providing service components which are not yet available from domestic platforms and players;
- sufficiently scalable processing capability;
- an open architecture that connects and integrates existing and future national or cross-border platforms and players, including increased choices in harmonisation of settlement (T2S);
- higher benefits of integration and automation to regulator and investors alike (refer to MIFID, EMIR, SFTR, AIFMD, UCITS, T2S);

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- further harmonization and standardisation in trading, clearing, settlement, custody, asset servicing (including identification of investors and distributors) of fund units and shares (refer to EFMA FPSG, SMPG, JWG ETF standards);
- standardized identifiers (LEI and ISIN for all instruments);

and possibly using blockchain technology where feasible for order-routing, settlement and asset servicing in one “go” and increased transparency of ownership.

5. Derivatives

5.1. Description

EU legislation defines derivatives by reference to a list of types of contracts that can be considered derivatives¹¹². Based on this list, derivatives can be defined as financial instruments used mainly to protect against and manage risks. They can also fulfill arbitrage or investment purposes. More concretely, a derivative is a contract between a buyer and a seller entered into regarding a transaction to be fulfilled at a future point in time. Over the life of the contract, the value of the derivative fluctuates with the price of the so-called ‘underlying’ of the contract, i.e. the financial instrument underlying the derivative contract. The life of a derivative contract, that is the time between entering into the contract and its ultimate fulfillment or termination, can be many years into the future. Given the possible price fluctuations of the underlying and thus of the derivative contract itself, the post-trading practice of managing counterparty and replacement cost risks of derivatives contracts is particularly important.

Derivatives can be characterized as either Exchange Traded (ETD) or Over-the-Counter (OTC), depending on the way in which they are traded.

5.1.1. Derivative uses

Derivatives make future risks tradable, which gives rise to two main uses:

- Risk management: Derivatives can be used to eliminate uncertainty by mitigating market risks, commonly known as hedging. Institutions including corporates, for example, use derivatives to protect themselves against changes in raw material prices, exchange rates, interest rates etc. They serve as insurance against unwanted price movements and reduce the volatility of cash flows, which in turn allows more reliable forecasting, lower capital requirements, and higher capital productivity.
- Investment: Derivatives are an alternative to investing directly in assets without buying and holding the asset itself. They also allow investments into underlyings and risks that cannot be purchased directly. Examples include credit derivatives that provide compensation payments if a creditor defaults on its bonds, or weather derivatives offering compensation if temperatures at a specified location exceed or fall below a predefined reference temperature.

Derivatives also allow investors to take positions against the market if they expect the underlying asset to fall in value. Typically, investors would enter into a derivatives contract to sell an asset (such as a single stock) that they believe is overvalued, at a specified future point in time. Such strategies are extremely important for an efficiently functioning price discovery in financial markets as they reduce the risk of assets becoming excessively under- or overvalued.

5.1.2. Derivatives Market participants

There are a number of participants involved in the derivatives space:

¹¹² EMIR defines a ‘derivative’ or a ‘derivative contract’ as a financial instrument as set out in points (4) to (10) of Section C of Annex I to Directive 2004/39/EC as implemented by Article 38 and 39 of Regulation (EC) No 1287/2006.

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- Client – person who holds the contract, and who will either deliver or receive the final outcome of the settlement, either cash, or the underlying asset.
- Execution brokers: these are the members of the trading venues who are responsible for executing client orders on that venue. The executing broker may or may not also be the clearing broker for the client. It is not uncommon for certain clients to use the services of several third party executing brokers but only one or two clearing brokers per CCP. It is also possible that some members of execution venues are trading on a proprietary basis, ie with no underlying clients. Some clients may also be permitted to be DEA users (Direct Electronic Access) by the executing broker or the clearing broker.
- Trading venues: these are the venues on which the execution broker places the order for its client, which will then be “filled”, or “matched” with an opposite order through the operation of the matching algorithm of the trading venue.
- Central counterparty (“CCP”): The ECB glossary defines a CCP as “an entity that interposes itself, in one or more markets, between the counterparties, ... becoming the buyer to every seller and the seller to every buyer ...”. The specific definition of “every seller” and “every buyer” applies in ETD clearing in Europe since derivatives exchanges are uniquely cleared by a single CCP, with the only exception being two exchanges that have a linked order book with transactions cleared by two CCPs serving the exchanges’ respective members. In the OTC derivatives markets sellers and buyers have a choice of different CCPs so the “every seller and ...” “every buyer” characteristic is valid for each CCP’s own members only but not for the whole market. In ETD clearing, the CCP will offer a pro rata or randomised allocation methodology to match positions for delivery and receipt, and will communicate the outcome of that process to Clearing Members. The predominant ownership structure is vertical– exchange groups own both the exchange and the CCPs that clear their trades; trade access is usually not given to additional CCPs owned by third parties. To date, CCPs set up to clear OTC derivatives are all under the same ownership as CCPs clearing ETD. In the last few years, at least two derivatives exchanges in the EU have repatriated clearing from third-party CCPs to CCPs they own themselves. Typically each particular ETD is only cleared on a single CCP, though MiFIR provides for open access which could permit ETDs to be cleared on multiple CCPs.

The nature of derivatives contracts is such that many contracts are created that do not attract much trading volume or revenues for the exchange. Each time an exchange introduces a contract, the CCP has to invest in capabilities to be able and ready to clear it, regardless of its chances of success. Common ownership of an exchange and CCP aligns business and financial incentives for new product development.

As of September 2016, there are fourteen European Union CCPs authorised and twelve third-country CCPs recognised by ESMA to clear derivatives in the EU.

Table K: CCPs Authorised and Recognised by ESMA for OTC derivatives and ETDs

CCP	OTC	ETD
European Union CCPs		
Nasdaq OMX Clearing AB	Y	Y
KPDW_CCP	Y	Y
Eurex Clearing AG	Y	Y
CC&G	Y	Y
LCH.Clearnet SA	Y	Y
LCH.Clearnet Ltd	Y	Y
Keler CCP	Y	Y
BME Clearing	Y	Y
Athex Clear	Y	Y
ECC	Y	Y
CME Clearing Europe	Y	Y
LME Clear	Y	Y
OMI Clear	Y	Y
ICE Clear Netherlands	Y	Y
Third-country CCPs		
SIX x-clear	Y	Y
ASX Clear Pty Limited	Y	Y
Canadian Derivatives Clearing Corporation	Y	Y
OTC Clearing Hong Kong Limited	Y	Y
Tokyo Financial Exchange		
Singapore Exchange Derivatives Clearing		Y
ICE Clear Singapore	Y	Y
JSE Clear	Y	Y
ICE Clear Canada	Y	Y
Canadian Derivatives Clearing Corporation	Y	Y
Korea Exchange, Inc	Y	Y
Chicago Mercantile Exchange	Y	Y

Source: https://www.esma.europa.eu/sites/default/files/library/ccps_authorized_under_emir.pdf

- Clearing Member/Broker – each client requires a Clearing member to provide access to the market. Clearing Members will receive instructions from clients to exercise or abandon

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5. Derivatives

their positions prior to expiry; will transmit those instructions to the CCP; will mirror the CCP's process of allocating assigned positions across clients holding relevant positions; and may manage the delivery of cash or the underlying asset on behalf of the client. A client may use multiple clearing brokers depending upon the types of contract being traded, and upon the trading venue and CCP used.

- **Middleware:** although this software could be proprietary of one of the participants described above, it is more commonly provided by a third party vendor. For listed derivatives, trading venues automatically submit details of all matched trades to the CCP which in turn publishes details of the clearing trade (normally via an API) to the relevant clearing broker for further trade management, ie for the assignment of trades to the correct position keeping account of the clearing broker at the CCP and to the correct client account in the clearing broker's back office system. Middleware is used to improve straight through processing through the generation of API message to the CCP (1) by the executing broker's clearing broker (to give up to client trade to the correct clearing broker) and the client's clearing broker (to take up/claim the client trade) and (2) by clearing brokers and the CCP to assign trades into the appropriate position keeping accounts at the CCP and the client accounts in the books and records of the clearing member.
- **Data providers** – contract data is provided by vendors supporting back office processing systems (e.g. FIS).
- **Agent Banks** – involved in the settlement of cash between Clearing Member accounts and CCP accounts, and subsequently between Clearing Members and clients.
- **Custodians and depositories** – responsible for settlement of title transfer and cash for securities (e.g. equity / fixed income).
- **Warehouse facilities** – issue, manage and hold warrants representing the underlying asset, and store the physical underlying asset.
- **Logistic providers** – a range of logistic providers (e.g. haulage, freight, tankers) are required for physical movement of bulk commodities; the timeliness of their operation is critical to the effective settlement of the contract. Relationships are generally between the client and the logistic provider, although the Clearing Member generally holds the risk of sanction from the CCP, in the event of delay or failure to accomplish settlement in accordance with CCP rules.
- **Trade Repository ('TR') – EMIR:** An entity responsible for centrally collecting and maintaining records of derivatives transactions under Regulation (EU) 648/2012 ('EMIR'). These records must be made directly and immediately available to ESMA and the relevant national and regional competent authorities. TRs are authorised and supervised directly by ESMA and are required to comply with the requirements set out in Art. 78-81 of EMIR and in Delegated Regulation (EU) 150/2013 as a material condition of their TR registration.
- **Registered Reporting Mechanism ('RRM'):** Entity responsible for centrally collecting and maintaining records of wholesale energy market transactions under Regulation (EU) 1227/2011 ('REMIT'). These records must be made available to ACER. RRMs are authorised and supervised directly by ACER and are required to comply with the requirements set out in Chapter 5 - Requirements for the registration of Registered Reporting Mechanisms (RRMs) – Published by ACER 7 Jan 2015.
- **Trade Repository ('TR') – SFTR:** An entity responsible for centrally collecting and maintaining records of securities financing transactions under Regulation (EU) 2015/2365 ('SFTR'). These records must be made directly and immediately available to ESMA and the relevant national and regional competent authorities. TRs will be authorised and supervised directly by ESMA and will be required to comply with the requirements set out in Art. 78 – 80 of EMIR and with the requirements of Art 12 of SFTR.

- Approved Reporting Mechanism ('ARM'): A person authorised under Directive 2014/65/EU ('MiFID II') to provide the service of reporting details of relevant transactions to competent authorities or to ESMA on behalf of investment firms. ARMs are authorised and supervised by the Competent Authority of their home Member State and are required to comply with the requirements set out in Art 66 of EMIR and MiFID/MiFIR RTS 13 adopted on 2 June 2016 (reference pending) as well as any domestic requirements.
- Approved Publication Arrangement ('APA'): A person authorised under Directive 2014/65/EU ('MiFID II') to provide the service of publishing trade reports on behalf of investment firms pursuant to Articles 20 and 21 of Regulation (EU) No 600/2014. APAs are authorised and supervised by the Competent Authority of their home Member State and are required to comply with the requirements set out in Art 64 of EMIR and MiFID/MiFIR RTS 13 adopted on 2 June 2016 (reference pending) as well as any domestic requirements.
- Consolidated Tape Provider ('CTP'): A person authorised under Directive 2014/65/EU to provide the service of collecting trade reports for financial instruments listed in Regulation (EU) 600/2014 and consolidating them into a continuous electronic live data stream of price and volume data. CTPs will be authorised and supervised by the Competent Authority of their home Member State and will be required to comply with the requirements set out in Art 65 of EMIR and MiFID/MiFIR RTS 13 adopted on 2 June 2016 (reference pending) as well as any domestic requirements.
- Further definitions are contained in specific sections in cases where they differ from the above definitions.

5.1.3. Clearing and Margining of ETD and OTC derivatives

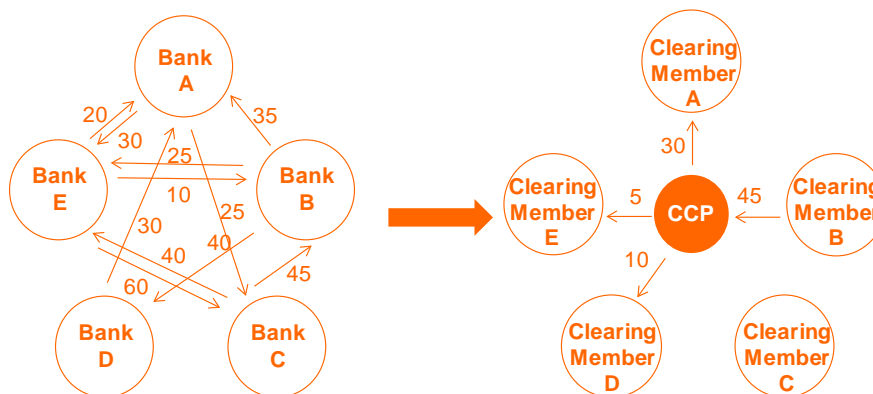
ETDs are cleared by central counterparties (CCPs) and always have been - indeed CCPs were developed in order to make ETD markets more stable and to prevent them shutting down due to defaults of members or clients. OTC derivatives within scope of EMIR are cleared. CCPs reduce and centrally manage counterparty risks for firms that trade with each other. The reduction in counterparty risk provided by clearing is done through:

- Netting: A CCP reduces the obligations between counterparties by netting offsetting positions. Netting can be bilateral between a pair of actors or multilateral among many actors (by interposing the CCP between each pair of counterparties). Multilateral netting reduces systemic risk by significantly reducing the amount of counterparties and associated payment flows. It also leads to significant operational gains, as payments can be netted and life-cycle events can be addressed in a much more centralized and efficient way.
- Risk management: A CCP independently manages the risk of counterparties through risk modelling and ensures there are sufficient resources available to absorb potential losses. The risk management function is particularly important for derivatives because of the potentially long duration of the contract and the subsequent risk of price fluctuations of these types of instruments.

A CCP centrally manages risks for members and their clients but does not itself take an open position. The legal rights and obligations of a CCP and its clients in respect of how risk exposures are managed, including loss-sharing provisions in the event of a default, are specified in a CCP's rule book. Due to the rule-based and risk-mutualisation business model, a CCP's clients are typically referred to as its clearing members (CMs) or participants.

In the event of default of one party, rather than all linked counterparties being affected, leading to an automatic liquidation (and replacement) of positions, in cleared trades it is the CCP that faces the defaulted party. Through the porting process, counterparty positions can be ported to other CMs, avoiding the need to liquidate and replace such positions.

Figure 26: Functions of CCP Clearing



Efficiency

- Open long positions are **offset** against open short positions in futures or options through a process called **Netting**. In the above example, the number of settlements is compressed from 11 to 4 (in reality the number of trades will have been significantly greater, and netting ratios approach 99%).
- The quantity of cash and securities to be moved is **compressed**.
- Credit risk exposures are also significantly **reduced**.

Risk management

- The CCP **manages** and bears:
 - **Credit risk**: the probability of a CCP Participant's default.
 - **Market risk**: the difference between the trade price that the CCP has to honour and the price at which it can replace the trades of a defaulted Participant.
- CCPs **limit contagion** risk by interposing themselves between buyers and sellers.

Source: EACH, <http://www.eachccp.eu>

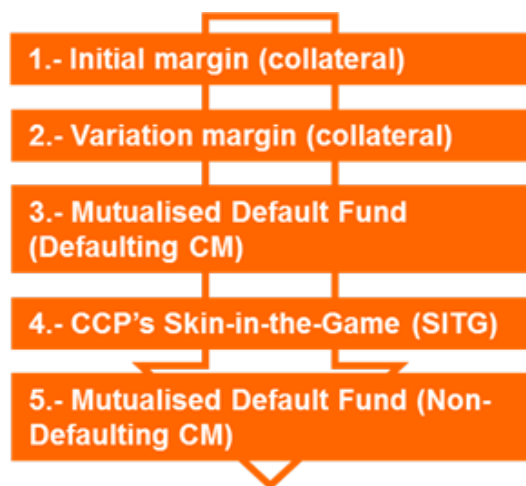
Safety

Because of CCPs' role in centrally managing risks for financial institutions, they are regulated under the European Market Infrastructure Regulation (EMIR) which stipulates prudential requirements to deal with liquidity and credit exposure (see lines of defence below) and capital requirements sufficient to ensure an orderly winding-down or restructuring of the activities over an appropriate time span and an adequate protection of the CCP against credit, counterparty, market, operational, legal and business risks which are not already covered by specific financial resources as referred to in Articles 41 to 44.

EMIR stipulates a number of lines of defence in the form of requirements and financial resources that the CCP must use in sequence in the event of a member default:

- Membership criteria
- Defaulter's collateral (Initial margin requirements)
- Defaulter's contribution to a loss-sharing fund (default fund)
- A portion of the CCP's own funds ('Skin in the game')
- Loss-sharing mechanism funded by non-defaulting members (default funds).

Figure 27: The CCP's default waterfall



Source: <http://www.eachccp.eu>

To ensure that the level of financial resources is sufficient for the transactions they clear, CCPs are required to conduct regular validation of their risk management applications that calculate collateral requirements and clearing fund contributions, and to demonstrate sufficient resources through several tests such as:

- Stress tests
- Liquidity tests
- Back tests
- Sensitivity tests
- Reverse stress tests
- Independent tests
- Default procedures tests

CCPs are also required under EMIR to have a minimum level of required capital, including sufficient funds for an orderly wind-down of their operations.

In line with CPMI-IOSCO standards European CCPs publish a broad set of quantitative data publicly available on their websites. The disclosure made available by CCPs include close to two hundred fields of quantitative data related to the parameters like credit risk, collateral, margin, liquidity risk, default rules and procedures, etc. This disclosure provides a better understanding of the way CCPs manage risks in financial transactions and deliver efficiency gains¹¹³.

5.1.4. The importance of post-trading for derivatives

The post-trading function, and within it the process of clearing¹¹⁴, is crucial for derivatives contracts because of the high leverage and long duration of these types of contracts.

The CCP maintains a balanced book of positions at all times and does not expose itself to market risk. An unbalanced book emerges when one or more CMs default, triggering the so-called Default-Management Process (DMP), which indicates that CCPs are exposed to the credit risk of their CMs.

¹¹³ Links to European CCPs' public quantitative disclosure
<http://www.eachccp.eu/cpmi-iosco-public-quantitative-disclosure/>

¹¹⁴ As opposed to securities, derivatives do not settle through CSDs. Therefore the core post-trading process for derivatives is the management of risk through CCP clearing.

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The clearing process is a fundamental risk mitigation tool which helps participants manage their counterparty exposures. Participants also experience material benefits in terms of:

- **Multi-lateral netting:** The fungibility of the cleared products/exposures of a single party to/from several counterparties enables exposures to be netted at the CCP level, resulting in significant counterparty risk reductions. These benefits have to be evaluated by the resulting concentration risk of all such positions with one counterparty – the CCP – and its systemic implications.
- **Operational:** The above netting process leads to significant operational gains, as payments can be netted and life-cycle events can be addressed in a much more centralized and efficient way.
- **Risk Management:** CCPs independently manage the risk of their CMs through risk modelling and ensure there are sufficient resources available to absorb potential losses. The risk management function is particularly important for OTC Derivatives because of the long duration and the liquidity characteristics of the underlying market.
- **Default Process:** Unlike the case of the OTC derivatives where the event of default of one party affects all linked counterparties, where under an event of default there is automatic liquidation (and replacement) of such positions, in cleared trades, it is the CCP that faces the defaulted party, and through the porting process, counterparty positions, can be ported to other CMs, avoiding the need to liquidate and replace such positions.

5.2. Exchange Traded Derivatives

Exchange-traded Derivatives (ETDs) – traded on regulated markets and characterised by a high degree of standardisation, liquidity and the management of the performance risk of the contract through CCP clearing. Over the life of the contract, the value of the derivative fluctuates with the price of the underlying of the contract. Many ETDs are initially developed as OTC instruments until the product matures and/or regulated markets make it available for trading creating a liquid market for such products. The OTC and ETD markets therefore coexist.

ETDs can be distinguished from exchange-traded securities as follows:

- ETDs are not ‘issued’ in the legislative sense i.e. subject to Prospectus directive. They are contracts, binding on the participants, created by exchanges for market participants to trade.
- Their terms are usually subject to intellectual property rights and unlike securities the number of contracts outstanding is not limited by the ‘issuer’ – i.e. the exchange.
- An ETD transaction may take years for the obligations of the contracting parties to be concluded, whilst an exchange-traded securities transaction is typically fulfilled after two days under a uniform trade-date plus two settlement cycle which has been implemented across the EU.
- The positions, prices and exposures of ETDs provide a high degree of transparency of the markets for the benefit of their users.

ETDs take the form of futures (i.e. a contract to buy or sell a particular financial instrument at the agreed price at a certain point in the future) and options (i.e. a contract that allows the holder the possibility to buy or sell a particular financial instrument at the agreed price at a certain point in the future). Exchange-traded derivatives contracts are typically in the range of EUR 20 000 to EUR

1 million notional, with the exception of single stock options and future, which have a standard contract size of around EUR 2 000 to EUR 5 000¹¹⁵.

Table L: Global Future and Options Volume by Category

Global Futures and Options Volume by Category						
Based on the number of contracts traded and/or cleared at 78 exchanges worldwide						
Category	Jan-Dec 2015	Jan-Dec 2014	% Change			% of total
Equity Index	8,342,860,438	7,338,870,063	13.7%		Equity Index	33.7%
Individual Equity	4,927,935,476	4,931,561,737	-0.1%		Individual Equity	19.9%
Interest	3,251,257,586	3,293,164,521	-1.3%		Interest Rates	13.1%
Currency	2,784,884,902	2,122,783,609	31.2%		Currency	11.2%
Agriculture	1,639,668,492	1,387,993,407	18.1%		Agriculture	6.6%
Energy	1,407,235,307	1,160,869,956	21.2%		Energy	5.7%
Non-Precious Metals	1,280,935,517	872,626,126	46.8%		Non-Precious Metals	5.2%
Other	819,713,435	353,997,195	131.6%		Other	3.3%
Precious Metals	321,272,201	371,064,966	-13.4%		Precious Metals	1.3%
Total	24,775,761,354	21,832,931,580	13.5%			
Note: Other includes contracts based on commodity indices, credit, fertilizer, housing, inflation, lumber, plastics and weather.						
© Futures Industry Association.						

Some derivatives develop from OTC to ETD. Exchange-traded derivatives can be broadly distinguished from cleared OTC derivatives in terms of the operation of the market of the basis of:

- The form of execution. OTC derivatives are agreed to bilaterally whereas ETDs operate through the placing of orders on an anonymous order book on the trading venue, which are then filled through a matching algorithm on the venue.
- Complexity of execution. Due to the operation of the matching algorithm on the trading venue, the matching process for ETDs is typically far more complex than for OTC derivatives, such that the matching may not be on a 1:1 basis.
- Size of market. Typically the ETD market is characterised by higher volumes but lower transaction values than OTC derivatives.
- Latency of process. The ETD market typically works on the basis of closely connected trading venues and CCPs, allowing for certainty and speed of clearing which is not present in the OTC market.

ETDs are traded on regulated markets, as defined by Directive 2004/39/EC. ETDs are typically cleared by a dedicated CCP¹¹⁶ although such CCPs also clear OTC instruments and will increasingly do so with the introduction of clearing mandates for OTC derivatives. It is important to understand that, although more than one exchange/CCP combination may support similar ETD contracts, there is a clear linkage between the exchange and the CCP for each contract; unlike an OTC contract, a client cannot elect which CCP they would like to clear the product they have traded. This one-to-one linkage between exchange and CCP is hard-wired into the industry infrastructure and IT systems used by a high proportion of market participants.

The value chain of an ETD transaction comprises pre-trading, trading and post-trading activities:

¹¹⁵ Source: The Global Derivatives Market: An introduction (Deutsche Boerse, 2008), page 8.

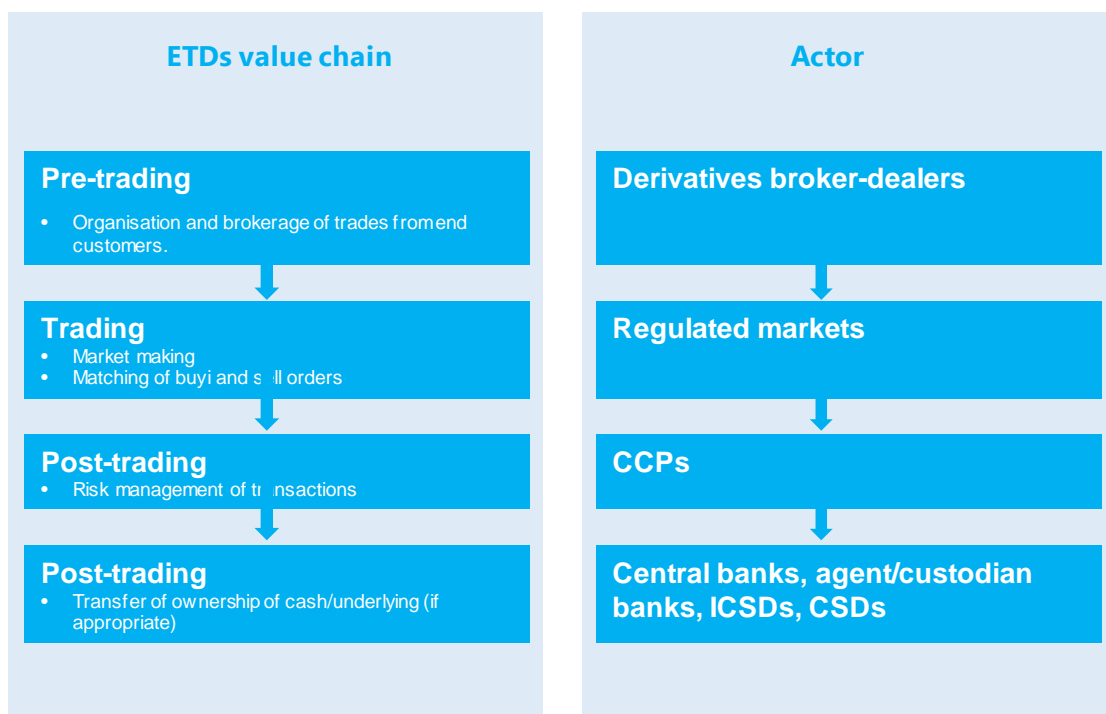
¹¹⁶ There are currently 18 European CCPs offering ETD clearing: ATHEXClear, BME Clearing, CC&G, CME Clearing Europe, European Commodity Clearing, Eurex Clearing, EuroCCP, ICE Clear Europe, IRGiT, KDPW_CCP, KELER CCP, LCH.Clearnet Ltd., LCH.Clearnet S.A., LME Clear, Nasdaq Clearing, National Clearing Centre, OMIclear, SIX x-clear and Takasbank

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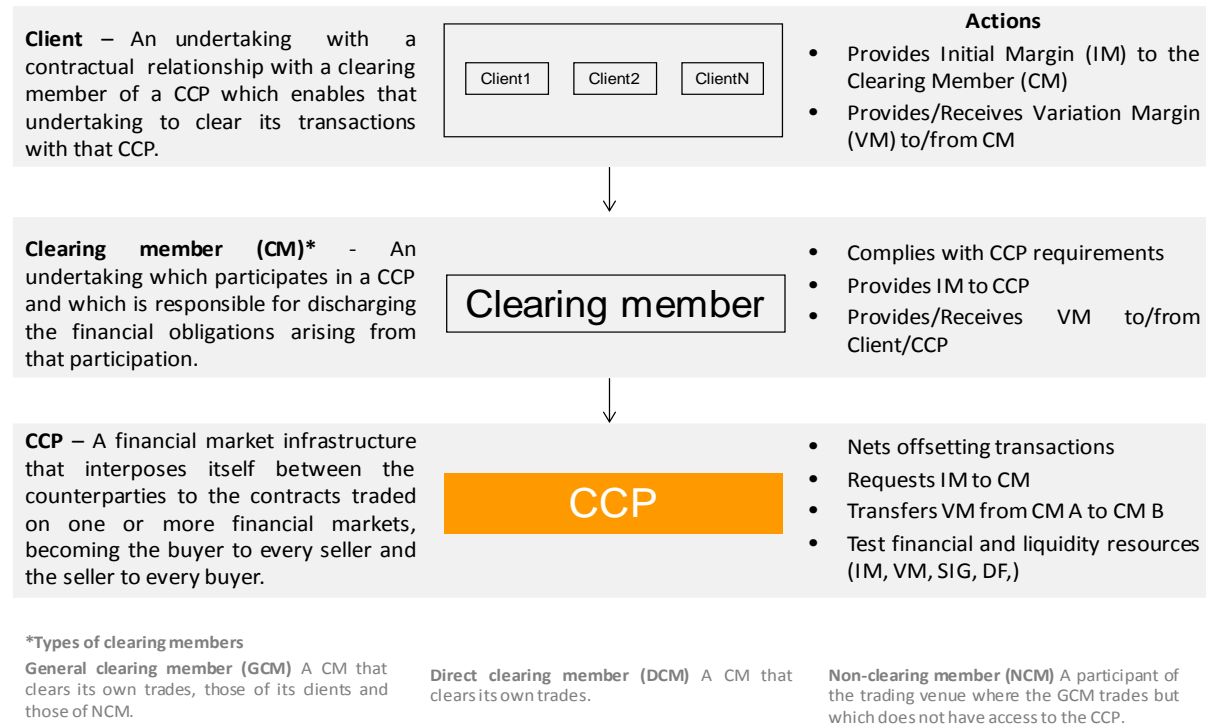
- **Pre-trading** comprises the origination and channelling of ETD client orders to regulated markets for the execution of transactions.
- **Trading** consists of the matching of buyers and sellers in ETDs. ETD dealers usually provide price offers for contracts.
- **Clearing** refers to the process of risk managing the open ETD contracts until their termination.

Figure 28: The ETD value chain



Source: <http://www.eachccp.eu>

Figure 29: CCP's Market participants - actors



Source: <http://www.eachccp.eu>

Broadly, the processing of all derivatives contracts follows a similar lifecycle and the market structure has developed to support the completion of these processes as required by the underlying contract

The key stages of the process flow are:

1. Pre-trade
2. Trade
3. Confirmation
4. Clearing
5. Settlement
6. Asset servicing
7. Reporting

The focus of this report is on the post trading activity, i.e. (3)-(7). Pre-trade and Trading process and market practice is covered to the extent that it provides context necessary to understand the post-trade practice.

5.2.1. Process and Market Practice

5.2.1.1. Pre-Trade/Trade

ETD are contracts created by and specific to an exchange, traded only under the rules of that exchange and cleared in the clearing facilities used and/or operated by that exchange. Another exchange may separately create an economically equivalent contract on the same underlying instrument which will be traded under the rules of that exchange and cleared in the clearing facilities used by that exchange. ETD contracts are not created in the same way as equity securities. Once a security is admitted to listing and subsequently admitted to trading, it may be freely traded

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and cleared in a variety of different infrastructures because it is fully interchangeable with any other examples of that same specific security. On the other hand, a derivatives exchange (regulated market under MiFID) creates a contract that is specific to that exchange, trades under the rules of that exchange and is cleared in the clearing facilities used by that exchange. Another exchange may separately create an equivalent contract on the same underlying which will be traded under the rules of that exchange and cleared in the clearing facilities used by that exchange. Thus derivative contracts with the same underlyings may in certain circumstances be priced differently, to reflect these distinctions. Such contracts are not considered to be the same contract any more than similar securities issued by different companies can be considered the same. However, market participants can use ETDs from different exchanges to hedge the same economic risk in which case the products are in direct competition even if the precise underlyings and contract terms may differ.

Contracts with similar underlyings may not be considered the same contract, any more than similar securities on different companies can be considered the same, however an important factor is how the contract is used by market participants to hedge risk. If for instance market participants use ETDs from different exchanges to hedge the same economic risk (e.g. energy or other commodity price uncertainty) then the products are in direct competition even if the precise underlyings and contract terms may differ.

The introduction under EMIR of a separation between house positions and client positions means that no clearing member can mix in its positions of its clients and its own proprietary business. In many situations the separation of clients from positions of the Clearing Member's affiliates is also required. Clearing Members offer market participants access to ETD markets (which are all cleared as a matter of market practice and soon - under MiFID - a matter of EU law). Clearing Members will also typically facilitate payment of margin to the CCP to cover both intra-day and end-of-day margin calls of initial and variation margin. Additionally Clearing Members may provide a series of additional services to clients, such as intra-day credit lines, collateral transformation services and, in certain markets (e.g. commodity derivatives), the financing of margins - through trade financing or similar arrangements. Clearing Members tend to have a range of clients with varying positions such that, taken as a whole, their clients' total positions broadly offset each other. This means that their open market exposure deriving from their client portfolio tends to be (but is not always) limited. Additionally it is worth noting that Clearing Members call portfolio margin from all of their clients which is normally based on the margin charged by the relevant Clearing House plus, depending on the nature of the client, add-ons to cover credit and/or counterparty risk. The Clearing Member will then pass on to the CCP margin to cover the margin called on each Client Account based on the net or gross margin computed by the CCP. Following the introduction of EMIR Article 39, Clearing Members are required to offer clients the choice of omnibus client segregation or individual client segregation and CCPs provide a series of Client Accounts to support such segregation requirements.

ETD trading consists of matching buyers and sellers with dealers usually providing price offers for contracts. They are traded on regulated markets, as defined by Directive 2004/39/EC and are typically centrally cleared by a dedicated CCP. As such, it is important to recognise that there is frequently a clear linkage between an exchange and a CCP and as such, there is no choice in the selection of CCP after a trading venue has been selected for the contract, though the user can likely access economically equivalent contracts on multiple exchanges to ensure they are able to use an exchange and CCP that meets their needs.

The traded amount of such contracts is in most cases 'notional', meaning there is ultimately no actual exchange for cash and notional is used for reference purposes to calculate periodic value. "Issuance" of a contract in ETD is upon the matching of a buy and a sell order in that contract between two parties. Issued amounts per ETD contract are standardised by the exchange on which

it trades. In theory, the supply of ETD is unlimited - in practice, supply is managed by the trading limits of market participants.

Trading in ETD products is generally anonymous as the counterparty to the trade is replaced by the CCP following trade confirmation. The CCP becomes the buyer to the seller and seller to each buyer through the process of open offer or novation.

5.2.1.2. Post-trade process and practice

5.2.1.2.1. Trade Confirmation

ETD trade confirmations are delivered at two stages in the lifecycle:

- At the time of execution: The execution venue submits a confirmation to the executing broker upon matching of the order (i.e. execution of the transaction), which the executing broker will then send on to the client. This may be in electronic form, for example by Bloomberg message, or by phone. This is required on a real-time basis for the client to understand its exposures, since an order cannot be executed until it is matched. In this respect, the client has no direct visibility with the counterparty in contrast to OTC trading.
- On T+1: The clearing member prepares a contract note at the end of the trading day, to be sent to the client (ordinarily) on a T+1 basis, which will confirm that the transaction has been cleared, as well as setting out the up-to-date content of the portfolio that the clearing member holds for the client. Such confirmation process is provided for in standard clearing agreements, the template for which is set by the FIA (Futures Industry Association).

Providing these confirmations on a T+1 basis allows, in the majority of cases, for the confirmation to show the break-down of allocations of a transaction between the funds maintained for the client. In the event of a problem with the allocations, eg if the trade is allocated late or if it is misallocated, the CCPs have a standard method of resolution for such discrepancies.

ETD clearing has been the principal application of CCP clearing and is essential because of trading firms' need to be protected against counterparty risk for the duration of a contract which can last years. CCPs clearing derivatives also use multilateral netting of fungible contracts to reduce risk in the system.

The life cycle, starting from the moment of execution through to settlement, is largely similar to that of a securities trade regarding trade transmission from the exchange to the CCP, novation, netting of fungible contracts, and provision of collateral by the trading firm to the CCP. The main difference in the life cycle with securities is that there is more than one way for the CCP to complete its trade guarantee. Derivative contracts could be cash settled or physically settled at expiry, but could also be traded out of, prior to expiry. In the event of a member default, some CCPs have a procedure to close out the position of the defaulted member not by going into the market but by holding an auction of the defaulter's positions among the non-defaulting members who are obliged by the CCP's rule book to participate.

The clearing of both derivatives and securities have many characteristics and processes in common. To avoid duplication, this section follows the structure of the securities clearing section and explains where clearing of ETD is materially different. Readers are advised to read the securities clearing part first or in conjunction with this part. Derivatives as an asset class cover many different markets, but the essential elements of derivatives clearing are also broadly the same.

It is worth noting here the significant differences between the OTC and the ETD markets which drive the differences in market practice. At a high level, the ETD market is one of high volumes and relatively low transaction values, whereas the OTC market by contrast tends to be one of low

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volumes but high values of transactions. This drives the way in which transactions are “matched” in both markets. Whereas in the OTC market transactions are agreed to bilaterally by the (largely) disclosed counterparties to the transaction, in the ETD market the orders of the clients are pushed on to the central order book of the trading venue on an anonymised basis, where the algorithm of the venue will operate to match that order. The order may not be matched on a one-to-one basis, eg an order could come in for 500 units of X, which could be matched with 500 orders of 1 unit of X, thereby creating 500 separate transactions. Similarly, certain strategy orders which can, for example, be split into two legs could be matched to two separate orders, thereby creating two transactions which together would equate to the order put in by the executing broker. This process of matching orders is on-going continuously throughout the day.

Clearable ETD products

The range of clearable ETDs is diverse and includes the following asset classes:

- Interest rate (e.g. fixed income futures and options; interest rate swaps futures and options).
- Equity (single stock and index)
- FX
- Dividend
- Volatility
- Exchange Traded Funds
- Commodities (e.g. soft commodities, non-ferrous metals, freight, energy)
- Property

The most complex process in clearing is data transmission due to continued reliance on email, and even fax, communication, and on manual entry into CCP user interfaces. Communication between CCPs, Clearing Members and clients in many instances lacks the efficiency and control that can be obtained by deployment of technology. A continued reliance exists on email, and even fax, communication, and on manual entry into CCP User Interfaces for a high risk function that has potential to result in significant financial consequences for any of the participants in the chain, if intentions are misunderstood, miscommunicated, or incorrectly manually executed. The lack of systematic controls in this communication flow also raises a risk of malevolent action by disgruntled individuals with access to data in CCP systems. Standardised imposition of modern technology enforcing system-to-system communication of information would enable a significant reduction of risk in one of the most sensitive of ETD post-trade processes. A blueprint for industry-wide architecture would be entirely focused around a reduction of systemic risk through:

- Implementation of full Straight Through Processing (STP) in communication and data transmission is currently being addressed by MiFIR¹¹⁷.
- Management, transmission and reconciliation of warrants and underlying assets via electronic platforms
- Standardisation of process across all CCPs (timings for exercise, assignment and expiry).
- Standardized reporting of events by CCPs to Clearing Members for onward transmission to clients.

Management, transmission and reconciliation of warrants and underlying assets are not via electronic platforms, processes across all CCPs (timings for exercise, assignment and expiry) are

¹¹⁷ <https://ec.europa.eu/transparency/regdoc/rep/3/2016/EN/3-2016-3944-EN-F1-1.PDF>

not standardised, nor is reporting of events by CCPs to Clearing Members for onward transmission to clients.

5.2.1.2.2. Competition

The introduction of EMIR represented a great step ahead to establish a level playing field for CCPs in the EU. Prior to the introduction of EMIR European CCPs were subject exclusively to national regulations. The EMIR Regulation made all authorised CCPs subject to the same prudential, organisational and conduct of business requirements, allowing them to compete on equal regulatory terms, while ensuring an adequate level of risk management.

Due to the vertical ownership structure of exchanges and CCPs, competition for or in a market is not usually a feature of clearing. Derivatives exchanges which list substitutable contracts compete with each other's bundle of trading and clearing service. Network effects help the largest exchanges attract more liquidity. In this regard, competition occurs at global level, where CCPs from different jurisdictions (e.g. the EU and US) may compete on the same types of products. This is why the importance of a level playing field at global level is crucial in order to ensure a healthy competitive environment. The recent agreement on a common approach for transatlantic CCPs¹¹⁸ between the EU and US is therefore a very important step in favour of fair competition.

5.2.1.2.3. Efficiency

Cross-platform netting, which is provided by a CCP that clears a firm's trades on multiple platforms in assets that can be netted to reduce financial exposure, is not a feature of derivatives markets. Derivatives exchanges can implement cross-margining in a cooperative arrangement to help reduce trading firms' collateral requirements. Cross margining is an arrangement whereby a firm's open positions in correlated contracts on the cooperating exchanges are margined together as one portfolio, with margin calculated on the net exposure and paid to one of the cooperating CCPs. The cooperating CCPs would need to have agreements in place to apportion losses in the event of a member default and the net collateral is insufficient to cover losses after the close out of the member's open positions.

5.2.1.3. Settlement

ETD settlement is the completion of a transaction or of processing with the aim of discharging participants' obligations through the transfer of funds and/or securities. A settlement may be final or provisional¹¹⁹.

ETDs may be cash- or physically-settled.

- In the case of **cash-settlement** ETDs, the holder of the ETD instrument does not take actual ownership of the underlying but rather receives the difference between the entry price and the settlement price. ETDs are usually settled in cash.
- In the case of **physically-settled** ETDs, the holder of the ETD instrument will deliver or take the underlying. This may be a financial instrument (e.g. an equity or bond) or a physical commodity.

¹¹⁸ http://europa.eu/rapid/press-release_IP-16-281_en.htm

¹¹⁹ <https://www.ecb.europa.eu/pub/pdf/other/glossaryrelatedtopaymentclearingandsettlementsystemsens.pdf>

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5.2.1.4. Asset Servicing

Asset Servicing relates to the administration of the underlying assets and the mechanism of updating the open derivative contracts.

There are several types of asset servicing events including corporate actions that affect open derivatives. These have been outlined in detail in the Asset Servicing section of the Securities document.

It is worth noting that the processing of corporate actions for the underlying of derivatives contracts differs greatly depending on the corporate action and the actors. Whilst much of the asset servicing of the underlying is automated there still exist many manual processes for options and futures contracts.

The asset servicing on the underlying is quite automated in general due to harmonisation of ISO SWIFT messages and the creation of Straight-Through-Processing.

However, the processing of Corporate Actions can differ greatly between markets and is generally less automated.

In simplest terms each Corporate Action Notice needs to be applied to the derivative as an adjustment to various open positions, i.e. ratio method (lot size, strikes), package, redesignation, fair value cash out, etc.

Based on this:

- Where appropriate, a CCP adjusts all open positions accordingly.
- All brokers / banks handling client positions will also need to apply and reflect such changes to ensure positions are accurately maintained.

When the shares underlying a derivatives contract which has not been exercised become ex-entitlement, contracts on such shares should be amended to reflect in economic terms a holding equivalent to the ex-entitlement shares and the Relevant Entitlement. The process used on some exchanges is as follows:

- altering the exercise prices of Option Contracts, creating Reference Prices for use as the basis for the determination of variation margin flow for Futures Contracts and the Lot Size of the respective contracts; or
- substituting the underlying shares in a proportion determined by the ex-entitlement holding with the new underlying shares; or
- settling (closing) Option Contracts and Futures Contracts at their respective Fair Value.

Where the timing of a Corporate Action requires an adjustment to be made to Option Contracts or Futures Contracts prior to authorisation from shareholders, regulatory bodies or any other such party that has power to disqualify the Corporate Action, such adjustments will be made in order to maintain the contract's relationship with the underlying shares. Adjustments made in the above manner are irrevocable, irrespective of whether approval is or is not obtained.

In a similar vein to the Settlement process, there is a significant opportunity for standardisation of process and deployment of modern technology to reduce risk of economic loss to all participants in the chain.

5.2.1.5. Reporting

Increased transparency was promoted as one of the commitments of the G20 Leaders' Statement from the Pittsburgh G20 Summit of 2009. Under the banner of strengthening the International Financial Regulatory System and improving the safety of over-the-counter derivatives markets, the

agreement was that OTC derivative contracts should be reported to trade repositories (TRs). Since then, various jurisdictions around the world have introduced legislation to implement the necessary derivative trade data reporting regimes within their jurisdictions, to meet this commitment.

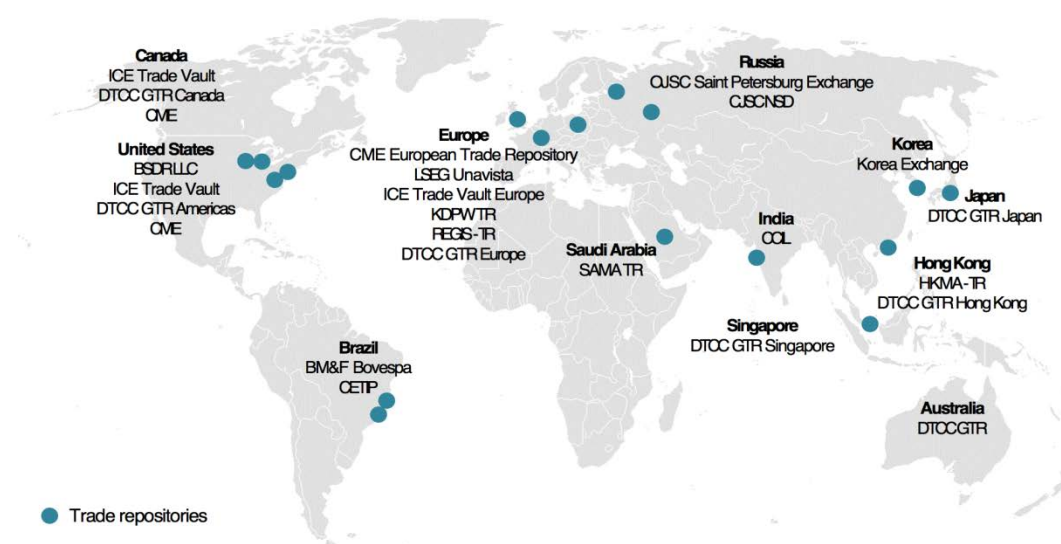
In Europe, the regulation goes beyond the original G20 requirement and EMIR is currently the only jurisdiction requiring the reporting of ETD as well as OTC derivative transactions.

Reporting legislation and regulation has since followed in many global jurisdictions with regulatory reporting now being required in the vast bulk of the global derivatives markets including Australia, Canada, the European Union, Hong Kong, Japan, Singapore, and the United States.

As at the time of writing, reporting regulation is under consideration in Malaysia, South Korea, Switzerland, and Russia.

Given that the EU requires the reporting of both ETD and OTC, as well as the mandatory reporting by both counterparties to the trade, it can be considered to be the most comprehensive reporting framework.

Figure 30: Main trade repositories in key global jurisdictions



Source DTCC/Aite Group.

The following objectives for data reporting may be identified:

- Enhanced financial stability through the reduction of systemic risk due to increased transparency of derivative markets;
- Price transparency for the assistance of investors;
- Observing the behaviour of market participants in order to police for abusive behaviour.

The diversity of these objectives can create some challenges. These include:

Data quality: An ongoing concern both within all global jurisdictions, relates to the quality of the reported derivatives data. Poor data quality reduces the value of the data for regulators and limits their ability to fulfill their regulatory tasks. Lack of standardisation and differences in requirements across jurisdictions increase the risk of misinterpretation and the cost for reporting parties that have reporting obligations in multiple jurisdictions. FSB, CPMI, and IOSCO have recently taken a number of steps to improve the data quality and undoubtedly more will follow.

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Legal restrictions. Cross border data sharing may come into conflict with local privacy and data protection legislation. The FSB have studied the issue in relation to OTC derivatives reporting to TRs. This peer review provides an update on the implementation of G20 requirements for trade reporting in OTC derivative markets, showing that most FSB jurisdictions have trade reporting requirements in place but certain legal and regulatory barriers to reporting continue to be a concern. FSB members have committed themselves to addressing legal barriers to reporting by June 2018, to removing masking of counterparty-identifying data by end-2018, and to having a fully implemented regime to permit access to data held in a domestic trade repository by relevant authorities (whether domestic or foreign) by June 2018.

Harmonisation of Global Legislation. Global jurisdictions have implemented reforms that mandate reporting and there is significant work being undertaken by global standard setting bodies such as the FSB, CPMI and IOSCO, in particular in view of harmonising data elements and their use for reporting. Nevertheless, and in spite of the acknowledgement that reporting should be harmonised globally to the extent possible, jurisdictions have implemented these reforms in vastly different ways. This complicates regulatory efforts to identify risks and industry efforts to achieve accuracy of reportable data and transparency for investors, while at the same time driving up the cost of compliance for market participants, due to the duplication of reports and a lack of consistency of data. The consequence is data fragmentation and legal uncertainty for both investors and supervisors.

Standardisation of Data. Consistent data standards, forms, and templates could facilitate the reporting that takes place under different pieces of global and EU legislation. One example of successful data standardisation is the adoption of the global standard known as the Legal Entity Identifier (LEI). Since it became available it has been widely taken up across the globe, and in particular in the EU. According to ESMA, LEIs are either required or are optional in 19 EU legislative acts. These include post-trade rules such as EMIR, MiFID/R, SFTR, Solvency I, AIFMD, Solvency II, CRD IV, and CSDR. MiFID mandates the use of LEIs; in the absence of an LEI, firms cannot trade securities in Europe. To purchase EU securities without an LEI, it would be necessary to route an order to a financial institution which has an LEI and can therefore transact in the EU with an EU financial institution. The FSB, CPMI, and IOSCO are working further to establish a system for unique transaction and product identifiers (UTIs and UPIs).

Standardisation of Messaging. Even though the output messaging standard in EMIR and MiFIR is defined as ISO 20022, the input messaging standard is not described in either piece of legislation. As a result, there is a requirement to translate or ‘map’ between the market standard, e.g. FpML, and the regulation standard, in this case ISO 20022. This can be done at central utilities such as TR’s where there will be an element of standard application of mapping rules, or it can be done by each individual reporting institution where bespoke mapping rules may be applied in a unique way.

Timing of regulatory implementation. There are three aspects of timing to consider:

- Market development of compliant systems: Provision of appropriate times for the reengineering of legacy systems being operated within the market.
- Coherence/conflict with other legislation: Regulatory timelines from development through to implementation have ripple effects on other regulatory activity, e.g. delay in MiFID2 vs SFTR.
- Phasing of implementation: Consideration of how a regulation is implemented is important to the success of the implementation. EMIR, for example, took a ‘big bang’ approach, i.e. applied to all participants and all asset classes on the same day. Generally it is considered that phasing by asset class and/or participant type assists in the creation of a successful implementation.

Within reporting, we can identify three principal areas of process and practice:

1. Submission of data
2. Processing of data
3. Consumption of data

5.2.1.5.1. Submission of data

Data submission standards: The use of standards on the market side of derivatives activity can be split into two categories:

Trades are typically executed and confirmed via electronic means and as such, use a standard set by the confirmation/affirmation platform that then need translating into the central infrastructures reporting template. SFTR is proposing the direct use of ISO 20022 for submissions to the TR by participants to avoid such translation.

Non-electronic trades input will inevitably rely on some human interface' interpretation of the central infrastructures reporting template and as a result, typically subject to lower levels of standardization and accuracy.

Third Party providers have graphical user interfaces (GUIs) into which trades are entered and then data is transmitted to the central infrastructure.

- Data fields – The data fields defined in the trading space are unique to the derivatives markets and are defined by the FpML organisation (<https://www2.isda.org/functional-areas/technology-infrastructure/fpml/> and <http://www.fpml.org/>). FpML data standards may resemble standards used elsewhere, e.g. date coding is in the ISO 8601 format (YYYY-MM-DD), but the FpML standard does not acknowledge this, i.e. does not specifically reference or recommend the ISO standard.
- Messaging formats – FpML has developed a set of messages uniquely designed to support the global nature of derivative trading and lifecycle maintenance.

Connectivity – Depending on the relevant regulation, reporting entities may choose to submit their data in one of two ways (note: whilst the act of reporting can be delegated, the obligation to report cannot and so the entity with the obligation is always held responsible for the reporting):

- I. On their own account using a direct link;
- II. Via a third party which can include:
 - a. Delegation of the reporting activity to a counterparty;
 - b. Delegation of the reporting activity to an independent service provider.

The decision to report on a firm's own account or via another party will be driven by two principal factors:

1. the cost of building a direct reporting link vs the cost of utilising a third party service that reuses an existing reporting link
2. the nature of the data being reported. So for example, many firms feel they can delegate reporting required under EMIR because there is no requirement to report personally identifiable information (PII is data that could potentially be used to identify an individual and as such, the protection of such data is subject to high standards of security). As PII (in this case, trader ID) is required under MiFIR, some firms are rethinking their delegated reporting arrangements.

5.2.1.5.2. Processing of data

Technical transport layer: The infrastructure that is used to process the data prior to delivery to the end user, will frequently define the technical transport mechanisms. Those in common use include SFTP, MQ and .csv file downloads. Central infrastructure providers will also usually have their own input formats ('templates') which are unlikely to match those of other central infrastructure providers.

Data processing standards: Where the data submission and data consumption standards differ, there is a requirement for translation between the two. Within the European environment, the global market standard (FpML) and the data fields required under EMIR, for example, are not equivalent. There are two ways in which this can be addressed:

- **Redesign of local systems:** Where a market participant operates only in the European jurisdiction, the redesign of their processing systems to match the requirements of the local legislation/regulation is a relatively simple task in the sense that whilst there is still a cost, the redesign needs take no notice of global standards where they differ from the European requirements.
- **Maintenance of global systems:** For participants operating in the global derivatives market, there will be a need to convert the global standard into the local requirement. This is achieved via 'mapping' which can be on a *1:1 basis*, i.e. direct match between data fields, or on a *many:1 basis* where a number of fields are used to derive the single required field. Mapping is more cost effective and consistent when it is implemented centrally and is therefore a feature of some infrastructural services that TR's provide to process data before delivery to the end user.

Validation of data: Individual legislative instruments often, but not always, identify the need for validation and usually provide a standard against which those validations should be made. However, in addition to potentially not being specified at all, validations may not be of sufficient granularity leading to issues of interpretation at the individual institution or infrastructure level. Consistency and accuracy of validation criteria should be enforced at the legislative level.

Central infrastructure provider process: Many of the regulations provide for the authorisation and use of infrastructures. However, whilst it is clear that such authorisations should match the provision of service to the regulation (the 'what'), they do not usually consider the 'how' the service should be provided. The result of this is a lack of consistency between how data is processed. This is most clearly illustrated in the EMIR requirement for reconciliation between TRs. Although the results of this process have been improving, the success of the process continues to be hindered by:

- TRs using different processes that may have variations in regulatory interpretation, data validation, process timing, system limitation in terms of file sizes etc. These limitations are now 'baked in' to the TR legacy systems making change in the absence of regulatory guidance, difficult and time consuming;
- practical commercial considerations around system changes – in the absence of a standard, which TR system prevails, i.e. which TR has to incur the cost of change;
- disconnects created by differing interpretations of regulation between regulatory authorities, e.g. maintenance of data on expired trades;
- a lack of understanding of practical/technical constraints, e.g. indefinite EMIR UTI/LEI pair matching record storage and comparison.

Output standards: In the same way that there is little market standardisation of input templates, similar issues exist for output templates for specific legislations such as EMIR. This causes issues in particular if the aggregation of data is required and is discussed below in the 'consumption of data' section.

Reusability of solutions: Many pieces of discrete European legislation contain specific transparency requirements in the form of reporting or disclosure requirements. Each piece of legislation that contains a reporting requirement is seemingly developed in isolation resulting in a confused end result which has led to:

- The creation of operational overhead: e.g. multiple types of central infrastructure (TR vs ARM) with associated authorisation processes and underlying business processes;
- A lack of coherence of processes: e.g. under MiFID, data is pushed to NCAs, under EMIR and SFTR, data will be pulled by NCAs.

5.2.1.5.3. Consumption of data

No thought had initially been given to the output of reporting from TRs. This has been demonstrated globally. All TRs have made their own interpretation of what outbound reporting is required. As a result, each TR has built a solution for outbound reporting and delivery ranging from simple daily activity reports to those who deliver Activity, Trade State and Aggregated reports.

Existing regulation does not take into consideration the size of data available and how to store this data.

The consumption of data is usually for one of three reasons, all of which are very different and require different manipulative techniques for the data:

- **Regulatory analysis:** Typically by regulators (NCAs and Central Banks) which comprise Prudential and Market Conduct Authorities for the identification and analysis of systemic risk or market abuse.
- **Public analysis:** Typically referenced by industry commentators/analysts for press or academic research purposes.
- **Competitive analysis:** Market participants may use data for benchmarking performance.

Consumption of data for these purposes tends to be dominated by a number of issues:

Access to data: Where data is not delivered directly to the end user, the mechanisms for accessing data processed via an infrastructure frequently rely on the provision of portals by the infrastructure providers. Again, in the absence of standards, these portals tend to be specific to the infrastructure. In some cases, regulatory authorities are providing further guidance on the creation of common portals (e.g. ESMA's TRACE project) although these are not universal in their application, only being available to sub-sets of data users.

Fragmentation: As with the submission and processing spaces, where there is a lack of detailed output standards with an implied or explicit requirement to have data aggregation, then the aggregation of the data becomes a complex and near impossible task. This is evidenced by the development of the common TRACE portal in Europe where ESMA has implemented such output standards to allow aggregation of data by the NCA's across all authorized TRs. Such standardization is also required in the cross border domain to facilitate global aggregation and systemic risk analysis.

Specificity of content/granularity: Regulation has tended to focus on the outcome required and not be too specific about how this is achieved. This is mostly manifested in the lack of granularity of content and standards. Where standards have been mandated, e.g. the use of the LEI, this has been found to be of tremendous benefit. However, it should also be noted that the specification of a particular standard is not always sufficient, there is also a need to specify the parameters of usage. An example of this is the UTI: A market standard for the form of the UTI is and has been available for some time. However, the way in which the UTI is applied, in particular the timing, creates issues.

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If the UTI is applied at the time of trade, it can be used downstream. If it is not applied until the end of the day, i.e. after reporting deadlines, then firms will construct their own dummy UTI's which negates the value of the UTI standard.

5.2.1.6. Future Trends - Trade Confirmation

As set out above, the process of give-up from an executing broker to a clearing broker is automated in the ETD market. An area where the industry is currently working to increase efficiency in this process is around the billing process for clearing services. Currently clearing commissions are commonly agreed between the executing and clearing brokers on an annual basis, and the process for determining the commission is highly manual. This is due primarily to the fact that key pieces of data on the trades are not received by the clearing member at the point that the trade is given up to it, which gives rise to delays and inaccuracies in the billing process. The FIA is driving changes to the current process to alleviate these inefficiencies, which the industry supports.

The potential access for CCPs to central bank liquidity in order to promote the safety and efficiency of the markets may be considered a challenge for the clearing industry.

EMIR requires that CCPs have access to necessary credit lines or similar arrangements in order to perform their services and activities. CCPs can obtain these either from central banks or commercial banks. CCP access to central bank liquidity is currently not implemented consistently across the EU. The possibility for CCPs to access central bank liquidity promotes the safety and efficiency of the markets. Access to central bank money usually requires a banking license. Providing all CCPs across the EU with harmonised access to central bank liquidity creates not only a level playing field but also ensures an alternative source of liquidity for the CCP.

In order to implement this access to central bank liquidity, a change to the EMIR provisions is not necessary if all central banks within the EU agree to provide access to such liquidity to the CCPs in their jurisdiction, as a complement to the objectives of EMIR. It appears that the final decision to grant access to central bank liquidity lies with the central bank¹²⁰.

Process to approve new products, services and risk models – The process for extending activities and services described in EMIR Articles 15 and 17 and the provisions regarding the authorisation of changes to a CCP's risk management models under Article 49 could be streamlined in order to ensure similar application in all jurisdictions and to achieve a more efficient capital markets union in the EU. The current process has generally lead to duplications of verifications and extended timeframes to approve a particular product.

5.3. OTC Derivatives

OTC Derivatives are bilaterally negotiated, customised contracts which are traded on the over-the-counter ("OTC") market, and are settled directly between the parties. The degree of customisation varies significantly, with the majority of the contracts being relatively standardised (in a broad sense of the word) and others much less so.

¹²⁰ This subject is discussed in the Report of the ESCB on the need for any measure to facilitate the access of CCPs to central bank liquidity facilities;
<https://www.ecb.europa.eu/pub/pdf/other/genc-2015-escb-reporten.pdf?ad207bdcdb583b7048066703b8cc6e60>

The following helps in classifying derivatives along several dimensions. Specifically, and depending on the contractual nature of the future obligations, derivatives broadly fall into one of the categories listed below:

- **Forwards:** These are contracts in which the parties have agreed to exchange obligations at some point in the future, at a price agreed upon now. That is, this contract is settled at some point in the future (say, three- or six-months or longer, from now). An example of such a forward derivatives contract is an agreement by a crop farmer to sell his produce at the end of the season (six months from now) for a price agreed upon today.
- **Options:** These are contracts in which one of the parties (the buyer) has the right but not the obligation (i.e. an “option”) to proceed with the exchange of the obligation it has undertaken by the contract at some point in the future. For this right, it pays to the other party (the seller) a premium (the options premium).
- **Swaps:** These are contracts which involve a package of several forward exchanges of obligations in the future. Typically, these are exchanges of payment streams between two parties, each of which is linked to, and calculated on, a different basis from the other. An example is an interest rate swap where one party makes a series of payments linked to/based on a floating rate of interest on a specified notional amount, while the other party makes a series of payments linked to/based on a fixed rate on the same notional amount.
- Finally, **complex** contracts typically involve combinations of the above categories of derivatives.

Yet, another classification categorises derivatives on the basis of the underlying asset (or asset class) to which the obligations to be exchanged at some point in the future are linked. According to this classification, most derivative contracts are subdivided along the following asset classes, which are similar to ETD:

- **Interest rates:** This asset class covers all derivative contracts linked to interest rates (swaps, options, and other exotic products) in all major currencies/markets. Interest rate swaps, which involve future exchanges of fixed rate for floating rate obligations¹²¹, are an example of such a contract.
- **Credit (indices and single names):** This asset class comprises derivative contracts which involve the transfer of obligations that are linked to the credit quality of an entity (single name) or a group of entities (indices). These contracts are designed to mitigate the credit risk associated with the reference entity.
- **Commodities:** This is a heterogeneous asset class of contracts linked to products across energy, metals and agricultural sectors, with some of these products being traded in the form of ETDs, and some others in highly customised OTC form.
- **Equities:** This asset class comprises of contracts with both standardised and highly customised features which are traded on exchanges or the OTC derivatives market respectively. An important characteristic of this asset class is its localised character which draws from the underlying equity markets in which such contracts are linked to.
- **Foreign Exchange:** This asset class straddles the “traditional” FX (spot and forward) market as contracts involve exchanges of obligations deep into the future (5, 10, or 30 years in the future, such as currency swaps, FX options and NDFs - non-deliverable forwards), or are more complex.

¹²¹ Most floating rate obligations are linked to 3 or 6-month LIBOR (LIBOR stands for London Interbank Offered Rate).

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- **Other:** Over time, there are a number of other types of OTC derivative contracts which link obligations to other markets such as life insurance (longevity swaps), weather (weather swaps), and other (e.g., inflation swaps). One could also speak of complex OTC derivatives which combine two or more of the above asset classes.

This section describes how the OTC derivatives market works and how the various post-trade aspects of processing such contracts are performed.

5.3.1. Description, Scope and Market Structure

As noted above, the broad definition of OTC derivative contracts points to three particular aspects which explain their diversity. One is their forward nature, namely, the fact that they are agreed upon now but settled at some time in the future. The second characteristic is the fact that such forward exchanges are linked to different methods of calculation (same asset class, like in an interest rate swap), and/or to different asset classes.

For example, as mentioned before, in an interest rate swap one party makes a series of payments linked to a floating rate of interest (typically 6-month LIBOR), while the other party makes a series of payments linked to/based on a fixed rate of interest on the same notional amount. In yet another example linking two asset classes, in a credit default swap (CDS), one party makes a series of payments linked to a floating rate of interest (say, 6-month LIBOR), while the other party makes (or not) a payment which is linked to the performance of a debt obligation of a specific entity or group of entities (reference entity(ies)).

The third characteristic is their longevity. OTC derivative contracts may involve exchanges of obligations/cash flows which may extend to 50 years (or even longer). Their flexible nature, combined with their longevity, make these instruments important risk management tools for a wide variety of participants (financial institutions, corporations, debt management offices, asset managers, insurance companies, pension funds, and many others) in the real economy as well as financial and capital markets.

For example, commodity derivative contracts are used extensively by commodity producers to sell their production forward for many years in the future, establishing certainty of future revenues, thus removing a significant source of risk and enabling them to focus on other – more important aspects of their business (e.g. becoming more efficient producers). Equally, commodity swaps are used by electric utilities, airlines and others to hedge (fix) the price of natural energy (oil, gas, coal, etc.), and thus establish better control in their businesses.

Credit derivatives are ideal instruments to hedge credit risk which arises in almost every aspect where bilateral transacting is involved (and thus exposure to the credit risk of the counterparty arises).

Equity derivatives markets instruments are used extensively by asset managers, insurance companies, pension funds and others to manage their exposures to equity risk. And interest rate swaps – the largest derivatives asset class by volume – see statistics below), enjoy wide use across the economy and market participants, be they financial institutions, corporations, insurance companies, pension and hedge funds, debt management offices and others.

Finally, because of their longevity, OTC derivatives help both the liquidity and price discovery process of the underlying cash markets, leading to better and more efficient markets. In doing so, they contribute to a more efficient economy in terms of better allocation of resources (they lead to prices which are more reflective of all the information, and such prices provide better signals to the

real economy for resource allocation). Thus, well-functioning and efficient OTC derivatives markets are instrumental to the Capital Markets Union project.

5.3.2. Market Structure of the OTC derivatives market

Since its inception in the early 1980s the OTC derivatives market has consisted of an informal network of interconnected (through inter-dealer market brokers) dealers, each of which has its own client networks.

Unlike exchange traded markets, in the OTC derivatives market there is not one centralised point where the market trades. Instead, transactions typically take place in a highly decentralised fashion either between dealers (dealer to dealer, in the so-called inter-dealer market), or between dealers and clients (dealer to client). Until recently¹²², it rarely was the case that client to client transactions were observed. In effect, every dealer offers its own market place, and such dealer market places are connected through the inter-dealer market.

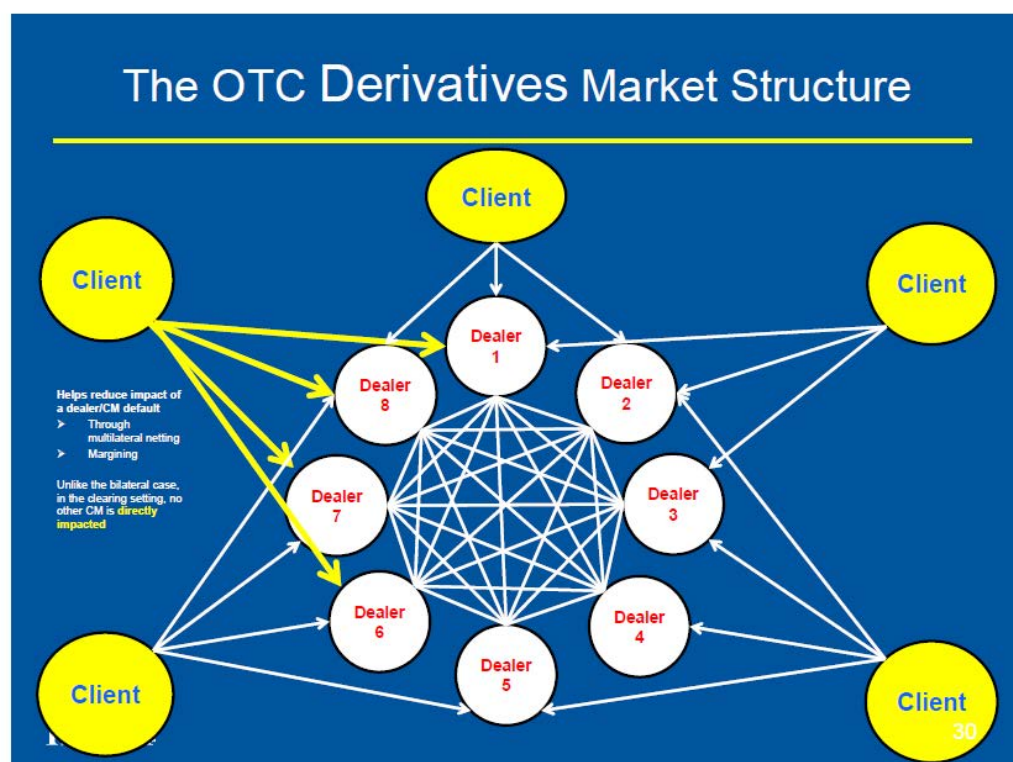
Another important dimension of this market has been its global character. Unlike securities markets which are typically organised around national markets with different conventions, the OTC derivatives market is perhaps one of the few examples of a globally linked and operating market whereby a US bank may transact with a European or Asian party (and vice versa) as easily as with another US party.

Figure 31 – ‘An Overview of the OTC Derivatives Market Structure’ is a pictorial representation of the OTC market structure that has been (and partly still is) in place today. Some key points to highlight are:

- The bilateral part of the market (as shown in Figure 1) continues to exist for those trades that are not cleared and not subject to margin requirements
- The vast majority (close to 70-75%) of trades will be subject to clearing, causing the structure depicted in Figure 1 to change to that described in Figure 3 in which most trades now either directly or through a Clearing Member, will be centrally cleared through a CCP.
- Cleared trades are required to be traded on electronic platforms. We have attempted to capture this development in Figure 3 by circling the “old” telephone based process and noting how this is being replaced for those trades to be traded on electronic platforms by the process in the green box.
- All trades – cleared or not – must be reported
- New and multiple capital requirements imposed on OTC derivatives (cleared and not) – Basel III, CVA, LCR, NSFR, FRTB, Leverage Ratio – have significant processing aspects
- Because the G20 conditions have been implemented jurisdictionally, there are significant differences which lead to multiple post-trading processes. As a result post-trade activities have the potential to be multiplied by an order of magnitude equal to the number of jurisdictions.

¹²² See, section 5.2.5 and 5.2.8 for recent developments in trading protocols and the emergence of the all-to-all electronic trading platforms.

Figure 31: An Overview of the OTC Derivatives Market Structure



Source: ISDA.

Trading in the OTC derivatives market has historically taken place by either (i) between dealers and clients reaching out to the various OTC derivatives dealers and asking for a quote or (ii) between dealers themselves. The features of each are set out below:

- **Inter-dealer (DtD) Activity:** In this type of activity, dealers typically offset or generate new risk positions by dealing directly with each other. To maintain anonymity, this activity is conducted through the so-called inter-dealer brokers. The method of execution is typically voice based, but over the past few years we have seen the emergence of electronic streaming platforms – offered by many of the same brokers alongside new entrants – where automated execution is possible. As noted further down (see section 5.2.5), this market is evolving rapidly because of regulatory reform and the obligation to trade on a ‘trading venue’, in particular.
- **Client (CtD) Activity:** This activity involves a client reaching out to several dealers, asking to provide quotes for a specific transaction they have in mind, and selecting the most competitive quote. This process is often called/described as Request-for-Quote (RFQ). This process has also been primarily a telephonic (voice) market, but increasingly it is also being electronified by vendors (who enable an electronic form of RFQ), or the dealers themselves who offer various forms of electronic streaming to their clients directly.

Associated with the above, are a number of pre- and post-trade functions that take place, such as the pre-trade credit check and client eligibility, possible collateral arrangements, etc). As explained in the post-trade section, regulatory reform has introduced a number of additional requirements (such as pre-trade transparency requirements, representations and Know Your Customer (KYC) requirements which have led to additional pre-trade processing requirements.

5.3.2.1. The Issuance of OTC Derivative Contracts

Unlike securities where issuance is physical, identifiable and unique to an issuer, the decentralised nature of the OTC derivatives market means that OTC derivative contracts with nearly identical characteristics (say, US\$ 10-year swaps transacted the same day by different dealers at different agreed rates) can be issued by several OTC derivatives dealers. Moreover, the traded amount is in most cases notional (that is, there is no exchange of that amount, as cash-for-cash exchange of same in the same currency makes no sense) and it is used for reference purposes (that is, to calculate the amounts/obligations to be exchanged periodically). Apart from the fact that such contracts are issued by different dealers, such contracts are not unique (as several dealers of comparable credit standing can issue them), and, in theory, their supply of such contracts is unlimited (in practice, supply is de-facto limited by the credit limits market participants have with each other).

Contract Specification: Unlike securities where there are specific rules for identifying and “naming” such securities (ISINs, CUSIPs, etc.), in the OTC derivatives market, there has not been historically any unique global identification mechanism. MiFID II/MiFIR requires the identification of OTC derivatives which are traded on regulated markets with an ISIN and the financial industry has already started to develop a mechanism for the issuance of a “real-time” ISIN code for OTC derivatives under the auspices of the ANNA/Derivative Service Bureau with a target delivery of January 2018 to coincide with the start date of MiFIDII/MiFIR. However, there remain doubts as to whether this initiative will deliver on the target date and, since it is not currently supported by the global regulatory community, it creates challenges at a global level. Furthermore, the proposed ISIN, in its current phase 1 construct is designed with the sole use case for MiFIDII reporting in mind and provides little benefit to the industry in terms of process efficiency.

Recent regulation in some jurisdictions has sought to introduce such mechanisms in the form of trade identifiers but there remains little global harmonisation. Given the global nature of the OTC derivatives market, it is clear that the absence of global consistency in the identification of newly issued OTC derivatives will be problematic especially in the reporting and use of OTC derivatives transactions data as required by the regulatory reform. These challenges associated with establishing globally consistent identifiers and the associated challenges for the OTC derivatives users in meeting the reporting obligation are addressed in more detail in the clearing section of this report.

5.3.2.2. Participants/Actors

The main direct participants in the derivatives market have typically been dealers and clients such as institutional investors, corporations, pension funds, highly regulated investment funds (UCITS/AIF) sovereign debt offices and insurance companies. However, there are a number of additional groups of participants who either provide services to the industry, or have recently entered this market, as a result of the derivatives regulatory reform.

- **Traditional OTC Derivatives Market Participants:**

- Dealers: All major European banks as well as banks from around the world with significant presence in Europe.
- Clients: Corporations, financial institutions, asset managers, insurance companies, governments, pension funds and others).
- Brokers.
- Middle ware/service providers: These are entities which provide services such as confirmation services, trade reconciliation services, compression services, collateral management services, and or risk and capital management services.

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- Law firms: Several global law firms with departments specialising in the IMA and its negotiation.
- Clearing Houses: Until the regulatory reform, clearing took place voluntarily.
- **New Entrants in the OTC derivatives Market**: As explained further in later sections, the regulatory reform is causing the introduction of many new processes – both pre and post-trading - and as such, new market participants offering associated services. New entrants are joining the market to either compete with existing participants, or to offer services which address the new requirements, including:
 - Pre-trade checking providers: These are services provide functionality to check that a transaction between two parties can be completed, and generate the list of all the regulatory obligations that such transactions will generate (the obligation to trade it on an electronic platform, to clear it, to report it, etc.).
 - Clearing Members (CMs): The requirement to clear, and the need to reach the CCP through a CM, has led to the emergence of this new group of participants. Clearing members serving the OTC derivatives market have come either from the traditional clearing community (i.e., the clearing members who already offer clearing services to users of ETDs), or the traditional OTC derivatives dealers who are expanding their offered services to their clients, to include clearing.
 - OTC derivatives Clearing Houses (CCPs): The mandatory obligation to clear most OTC derivatives transactions has led to the emergence of several clearing houses which offer clearing of OTC derivatives.
 - Electronic Trading Platforms: Again, the trading obligation is leading to the introduction of several electronic trading platforms. In the US, they are in the form of the so-called Swap-Execution-Facilities (SEFs), while in Europe the trading obligation regime is still under formation with MIFID/MIFIR.
 - Data Reporting Service Providers: Finally, the reporting obligation has led to the emergence of several service providers catering for the collection and submission of the required reports on behalf of their clients, as well as the emergence of various Trade Repositories (TRs) which are eligible for collecting such data on behalf of the regulators.
 - Fin-Tech: More broadly, the new and multiple requirements emanating from regulatory reform have acted as a beacon for a number of newly formed (and existing) hi-tech firms who are converging in this space with the view to provide innovative ways and services to market participants to address such challenges.

5.3.2.3. Competition

In the OTC derivatives market at its infancy, banks were trying to identify parties with exactly corresponding and opposite needs (such as, the celebrated World Bank –IBM currency swap). In that environment, banks were acting as agents/brokers on behalf of their clients. In selected circumstances, they would intermediate the transaction between two the parties, and in that capacity, banks in addition to their role as agents, acted as credit intermediaries accepting (and charging for) the credit exposure/risk of the two parties they faced.

However, the development that proved crucial to the growth of the market was when banks realised that, in addition to intermediating the transaction, they could step in and offer liquidity to the parties involved, without necessarily having secured the other party on the other side. Instead, they would temporarily warehouse or take on a principal capacity the risk associated with the transaction, and attempt to find an offsetting transaction among their clients. Since the banks involved would be exposed to the risk they had undertaken by being principals in the transaction – even on a temporary basis – they would typically hedge such transactions while they held them.

This development provided a major boost to the liquidity of the market, and proved to be a profitable activity for the banks involved. It also transformed the nature of the bank's role from an agent and/or intermediary for credit enhancement purposes, to a market-maker/dealer which would be ready to offer bids and asks (and thus, liquidity) to its clients. As a result, several banks of certain credit quality and above (a good credit quality being a prerequisite of being an acceptable party to these transactions), became active participants in this market, have been and are still active in this market.

As it can be seen from Figure 1, dealers perform a fundamental function in this market as, in effect, each of them makes its own market (by quoting bid and offer prices) to its client base. However, the very same clients can obtain simultaneous quotes from several dealers (and they typically do). As such, the market competition is high among the banks which are active as dealers in this market.

The global nature of the OTC derivatives markets means that, in most derivatives product markets competition is global, namely US banks compete with European and Asian banks. Equity derivatives though do have a strong local character as they are tied to the local cash equity markets (e.g. European level).

Since the 2008 crisis, the number of dealers that remain active in this market has declined, either because their credit rating was reduced, and/ or as a result of regulatory reform which has led to increases in the cost of doing this business. The regulatory reform has imposed additional capital and other requirements, leading to a higher cost of doing business, while the levels of the bilaterally traded activity are no longer growing. As such, several banks have made the business decision to exit the business. Having said that, competition is still strong among the dealer banks.

As discussed above, the regulatory reform has also introduced new participants and has led to the creation of new market segments. As a result, the OTC derivatives market structure is evolving and it is too early to draw conclusions about the state of competition in these markets.

While the longevity and customised nature of OTC derivatives contracts appeals to many users, it presents its own challenges. Longevity means that the credit quality of the parties involved is of paramount importance and mechanisms (and associated incremental processes, such as collateralisation) need to be put in place to assure the quality of the other party. In addition, the life cycle requirements of such transactions increase. Also, their customised nature implies that the opportunities for standardisation may be less available, increasing the complexity and cost of supporting such activity from a post-trade processing point of view.

Unlike ETDs which have been traded on exchanges for a long time, the emergence of the OTC derivatives market is a relatively recent phenomenon, dating back to the late 1970s/early 1980s. It traces its origins in periods of increased volatility in the asset classes underlying the derivatives, which leads to a need to hedge. In particular, the growth of these instruments exploded in the 1980s, 1990s and early 2000s, as volatility (and thus the need to hedge) in the various markets increased in reaction to globalisation, deregulation and global innovation trends. It started with FX volatility in the late 1970s/early 1980s following the collapse of Bretton Woods and the ensuing FX volatility which led to the emergence and growth of currency swaps, and continued with the emergence of interest rate swaps, following the Volcker policies in the US which led to sky-high and volatile interest rates. The growth of other asset classes, such as commodities, equities, and credit, has followed a similar pattern, amplified by the megatrends of globalisation (with derivatives being the ideal instruments in linking various markets around the world), deregulation, and innovation.

The following table presents some statistics – compiled by the Bank of International Settlements (BIS) – of the relative size of these markets, measured by the notional amounts of the contracts outstanding as of the end of 2015.

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Table M: Notional Amounts Outstanding of OTC derivatives as of Dec 31, 2015 (In USD Trillions)

Foreign Exchange Contracts	\$ 70 446
Interest Rate Contracts	\$ 384 025
Equity-Linked Contracts	\$ 7 141
Commodities Contracts	\$ 1 320
Credit Default Contracts	\$ 12 294
All Contracts	\$ 475 226

Source: BIS.

5.3.3. Post-Trade Activities

Unlike the ETDs where the majority of post-trading functions is concentrated in and performed by the clearing house – typically the exchange in which such contracts are traded - the decentralised and customised nature of OTC derivatives market has implications for post-trading activities. Instead of one single centralised place where all life cycle, confirmation and settlement steps take place, in the OTC derivatives market, there are multiple post-trading processing places with each dealer having its own post-trade processing environment. Moreover, because of the global nature of the OTC derivatives market, some dealers (particularly among the major global banks) have tried to achieve scale by putting in place “global” post-trade solutions, in the sense, that their post-trade activities have been centralised and streamlined to address all their global OTC derivatives needs in a systematic (and standardised) way where possible. In many cases, this has resulted in outsourcing or offshoring (in places as far as India) many of the more standardised activities.

The lack of a centralised place where such processes can take place does not allow for multi-lateral netting¹²³ adding to the number of transactions which need to be processed. Moreover, the long longevity of the OTC derivatives contracts implies that such contracts need to be maintained over much longer periods of time (up to 50 years), in contrast to most listed ETD contracts which typically have a 3 to 6-month life span. Connecting these dealer specific decentralised post-trade processing centres are some market-wide services/functions being performed by various vendors. For example, vendors offer affirmation/confirmation services which allow dealers to confirm their transactions. Equally, there are vendors which offer compression¹²⁴ services.

Because of considerations such as the above, along with the plethora of new post-trade requirements which have been introduced by the regulatory reform, in the following we outline the key components of the OTC derivatives post-trade landscape.

¹²³ sections 3.3 and 5.1 for the benefits of clearing, particularly when it comes to multi-lateral netting.

¹²⁴ The word “compression” is used to describe the process by which various dealers simultaneously reduce the number of transactions outstanding for the purpose of reducing post-trade requirements (and thus, risk), without altering their risk profiles. This is achieved by simultaneously cancelling bilateral transactions among various parties.

In practice, this is achieved by a service which uploads the portfolios of several dealers (the larger the number, the more the opportunities for identifying trades to be cancelled) and running an optimizing algorithm to identify pairs of trades which can be removed/compressed (and in some cases substitute them with a much lower number of new trades) without altering the risk profile of the participating banks.

5.3.3.1. Documentation

The majority of the OTC derivatives transactions are documented under the so-called ISDA Master Agreement (IMA)¹²⁵. The IMA, through its annexes and other associated documents, covers all aspects of the trades while preserving the ability of the parties to customise transactions where necessary and provide material advantages in the form of a commonly used document/contract with a menu of standardised terms. Furthermore, it enables the netting of payments (and thus exposures, from a legal point of view and where possible, from an operational point of view) of all the OTC derivative transactions captured by an IMA between two parties. In this respect, the IMA has proved to be an extremely useful risk mitigation tool.

Alternatively, market participants use also national master agreements (e.g. German Master Agreement for Financial Derivatives Transactions) which have the generally the same common feature like the IMA agreements.

The legal enforceability of the IMA and the linked Credit Support Annex (CSA) which deals with the collateral aspects of IMA, is reinforced by a web of legal opinions attesting to the enforceability of these contracts among the various European states. This has been tested repeatedly over the past 20+ years and proved to be very robust. As such, the IMA constitutes a significant cornerstone of the OTC derivatives market infrastructure and its development has been instrumental to the growth of this market.

Trade and Counterparty Set-Up

There are a number of pre-trade activities such as credit check, collateral arrangements which need to be in place before an OTC derivatives transaction is entered into. However, as explained in section 5.2.3, the regulatory reform¹²⁶ has introduced a number of additional requirements – varying from jurisdiction by jurisdiction – including items such as the registration of users of OTC derivatives (in the US), “knowing your customer” – KYC – requirements, as other declarations aimed at categorising users of OTC derivatives into categories such as Financial institutions (FIs), Non-Financial Institutions (NFIs+/-), etc., as well as others. This is leading to a proliferation of new post-trade processes as well as new entrants aiming to support such demands through their offerings.

¹²⁵ The use of the IMA is wide and pervasive globally, particularly with respect to cross-border OTC derivatives transactions (namely derivative transactions between parties residing in different countries/jurisdictions) where it is used almost exclusively. However, in several European states, local versions of the IMA have been developed. Some of them are simply translations from the IMA English version, others rely on IMA definitions (and have the benefits of the continued updates in the IMA, through the so-called protocols, i.e., a way to consistently modify contracts by simply accepting them, as opposed to negotiating them bilaterally), while others, less so. Being simpler and in local language, the local agreements are used to document OTC derivative transactions with local clients in such countries. However, since the dealers offering such products domestically (and document them with the local agreement) typically hedge themselves with other international dealers (where the prevailing agreement is the IMA), there is always the incentive to ensure that the terms of such local agreements align with the terms and scope of the IMA.

¹²⁶ See discussion of EMIR requirements in to ensure that the terms of such local agreements align with the terms and scope of the IMA.

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5.3.3.2. Affirmation/Confirmation and Settlement of trades

Once an OTC derivatives transaction has been agreed upon¹²⁷, a confirmation of the transaction must take place. In this respect, many market participants use the terms ‘affirmation’ and ‘confirmation’ interchangeably to describe essentially the same thing, that is the post-trade process of confirming/ensuring that the agreed upon terms of the transactions are correct. In practical terms, in prior times, affirmation was meant to describe that part of the confirmation process which involved assuring that all optional information fields (such as interest calculations, holidays, etc.) were aligned and correct, before a confirmation was issued and agreed upon. Nowadays, the industry (and Markit-wire in particular – which is the main confirmation hub that is used by most OTC derivatives participants) still uses the term “affirmation” to describe what is generally perceived confirmation. Even the CFTC rules on Straight Through Processing (STP)¹²⁸, make reference to affirmation hubs pointing at infrastructures such as Markit-wire.

So the affirmation/confirmation process is now either fully automated through such middle-ware providers which rely on pre-loaded terms of the IMAs among the parties involved, and focus on confirming the additional trade terms. As an example of affirmation/confirmation, consider a standardized 5-year US\$ interest rate swap which has traded with an agreed spot start date, an agreed upon amount, an agreed upon rate – the swap rate or spread - and an agreed upon termination date. In this simple example, the confirmation process would confirm those terms and rely on the remaining IMA terms which are stored at the middle-ware provider. However, if the trade contains additional characteristics, e.g. a forward start, is against 1-year LIBOR (as opposed to the typical 6-month LIBOR), or has an early termination clause before the final maturity, the affirmation of these additional terms needs to take place before a confirmation can be issued.

Allocations: An additional operational requirement for the buy-side is the trade allocation process. Typically, large fund managers trade on behalf of several underlying funds. An important requirement for them is to have a correct allocation of trades in the respective funds, that is, the process by which a large trade is subdivided into smaller ones which, in turn are allocated to the appropriate fund sub-accounts. The need for allocating such trades among the underlying funds, introduces another level of complexity in the post-trade process as allocations frequently are made only after the original trade has been executed.

Settlement: Once a trade is confirmed then it gets settled utilising existing systems. Most trades are settled in cash, but there are settlements which lead to new trades (e.g. the exercise of a swaption¹²⁹ which may either be settled in cash, or it may lead to the establishment of a new swap position, depending on what exactly the contract spells out.

5.3.3.3. Life-Cycle Management of OTC Derivatives

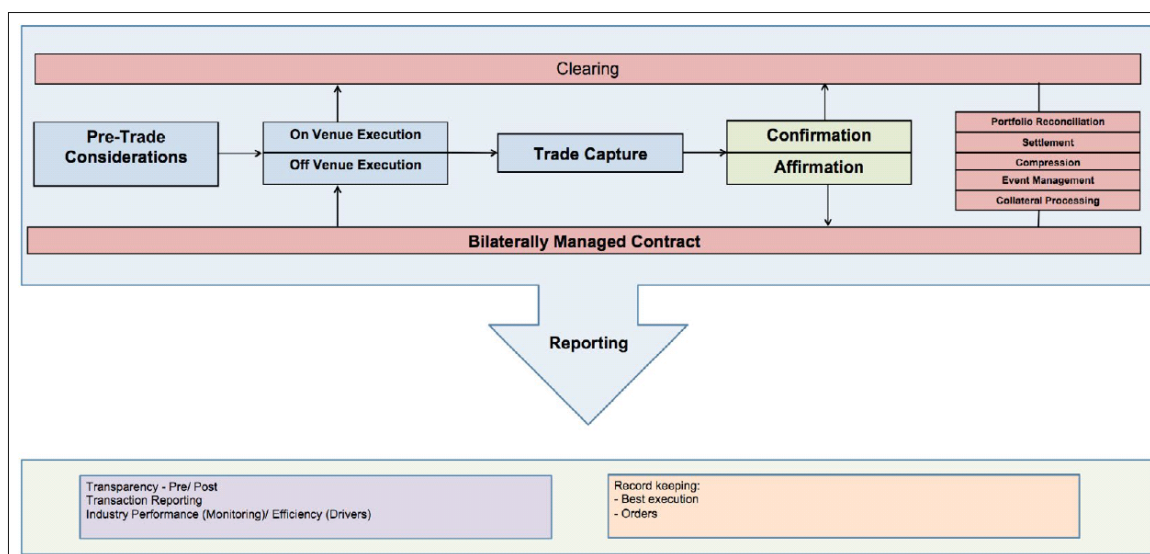
Figure X captures the major components of a generic post-trade OTC derivatives process as a linear step by step flow which reflects the core functions that support a trade from its inception through its life cycle.

¹²⁷ However, the execution of this transaction has taken place. Namely, either agreed upon verbally, between traders or traders and clients, or executed on an electronic platform. See section 5.2.5 on OTC derivatives trading.

¹²⁸ The CFTC STP rules call for affirmations/ confirmations to be issued within 10 minutes from the execution of the transaction.

¹²⁹ A swaption is a type of an option which gives on expiration the buyer of such contract, the option to either enter into a swap transaction at an agreed upon swap rate for a certain maturity, or let the option expire worthless. Moreover, the buyer may have the option to either enter into a new trade, or simply cash in the difference between the agreed upon swap rate and the prevailing swap rates (cash settlement).

Figure 32: Generic OTC Derivatives Post-trade Process Flow



Source: ISDA Whitepaper titled “The Future of Derivatives Processing and Market Infrastructure”, dated Sept 15, 2016.

As it can be seen from the above Figure 32, there are a number of post-trades activities that take place during the life a transaction, after the confirmation and settlement process. Typically, such activities can be categorised as:

- a. Event management activities, including the calculation and settlement of the periodic exchanges during the life of the transaction (e.g. every 3 or 6 months), as well as the processing of any additional terms, such as early termination, or close outs¹³⁰. Feeding, maintaining and updating a number of associated systems relating, to the Financial Control, Transactions Reporting (more further down), Trading Exposures Management, Credit Management, Accounting, etc.),
- b. Events associated with the processing of any collateral held against transactions (e.g. the calculation of exposures to life events, such as Portfolio Reconciliation, Exposures calculation, the resolution of emerging disputes in any of the above, etc. The operational aspects of collateral management are further discussed in section 6 on Collateral Management.

To address the post-trade needs, market participants use a combination of in-house processes as well as services provided by a number of “middle-ware” market providers (see section on participants above).

¹³⁰ There are two particular events worth noting. The first one is the close-out process triggered by the default of one of the parties which, according to the IMA, provides the other party with the right to replace the transaction(s) it has with the defaulted party. This is accomplished by entering into a replacement transaction, calculating the cost of such replacement, and (depending on if collateral is held), settling such claim against collateral held, or stabling a claim against the estate of the defaulted party (if the cost of replacement is a positive number). There are a number of operational steps involved in this process, and the events following the bankruptcy of Lehman in 2008, attest to some of the associated challenges.

The second event is the processing of the credit default swaps (CDS) in the case where the reference entity defaults which gives rise to a number of operational challenges, including, the determination that a default event has occurred, the obligations (deliverables) which qualify for delivery against the obligations called under the CDS contract, and the determination of the so-called “Final Price” at such CDS contracts are settled. To address these issues, and associated operational processes, ISDA has set up an industry wide process driven by the so- called Determinations Committee – see ISDA website for more information www.isda.org.

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We note that the decentralised nature of OTC derivatives, means that most of these processes (both inside and outside the respective firms) are often unique and custom-built for the processing of the OTC derivative transactions, sitting separately and managed separately from the processing of securities and even the ETDs (which, as noted above, are exchange focused). At the same time, for such a complex de-centralised system to work efficiently, there is a need for standards (be they, data and data formats, technology standards, documentation, and operational processes).

5.3.4. The OTC derivatives regulatory reform

With the advent of the post 2007-8 regulatory reform, OTC Derivatives have been the subject of extended and significant reforms with significant implications both for market structure and associated post-trade activities. Specifically at the G20 summit at Pittsburgh in 2009, it was agreed that:

*"... All standardized OTC derivative contracts should be traded on exchanges or electronic trading platforms, where appropriate, and cleared through central counterparties by end-2012 at the latest. OTC derivative contracts should be reported to trade repositories. Non-centrally cleared contracts should be subject to higher capital requirement ..."*¹³¹.

Later on (in 2012), and following a call by the G20, BCBS and IOSCO through the so called Working Group on Margin Requirements (WGMR), yet another requirement was introduced in the form of standards for the margining of most non-cleared OTC derivatives. Consequently, the regulatory reform has introduced five new major structural changes to the OTC Derivatives market, namely:

- The requirement that all standardised OTC derivative transactions to be centrally cleared through CCPs
- The requirement that all standardised OTC derivative transactions to be traded on electronic platforms, where possible
- The requirement that all OTC derivatives to be reported into trade repositories
- The requirement that all OTC derivatives to be subject to new capital requirements (Basel III, CVA, LCR, NSFR, FRTB, Leverage Ratio) and
- The requirement that most non-centrally cleared OTC Derivatives should be marginated

The G20 pronouncements in 2009 have been implemented jurisdictionally, with United States first to implement them through the so-called Dodd-Frank-Act, in 2012. In Europe, the respective process is being implemented through a combination of EMIR and MIFID/MIFIR. Similar implementations have taken (or are in the process of doing so), elsewhere around the world – Japan, Canada, Mexico, Australia, Singapore, etc.

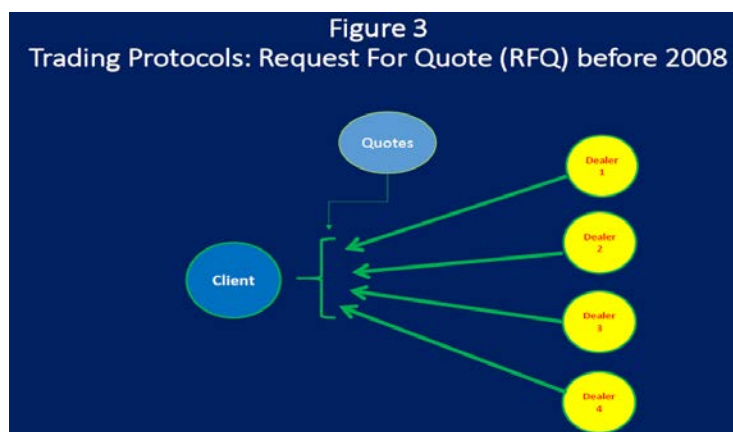
The regulatory reform has had already a major impact on the post-trading of the OTC derivatives market, as it has introduced a number of new regulatory requirements with significant post-trade implications. Further complicating matters is the fact that the G-20 pronouncements have been (or are being) implemented jurisdictionally around the world, giving rise to differences in implementations and occasions of jurisdictional overlap and conflict. The need to address such differences leads to the requirement for creating multiple post-trading processes to address the different regulatory demands. Because of the major impact such reforms are having on the OTC derivatives infrastructure, we devote the next few sections describing the new requirements, their impact on the existing-post trading activities, as well as a description of the new requirements and the new trade processes which are emerging. This process is still under way, and it remains unclear what the final state of the post-trading environment will look like five years from now.

¹³¹ <http://www.g20.utoronto.ca/2009/2009communique0925.html>.

5.3.5. The Requirement to Trade on Electronic Trading Platforms

As noted in section 5.2, the OTC derivatives market comprises a network of dealers each of which has its own client base. If a client wishes to enter into an OTC derivatives transaction, it typically reaches out to several dealers with a request to each of them to provide a quote in the so called Request-for-Quote (RFQ) process. Most clients would typically make an RFQ by calling two or more dealers, in a process graphically depicted in Figure 33 below.

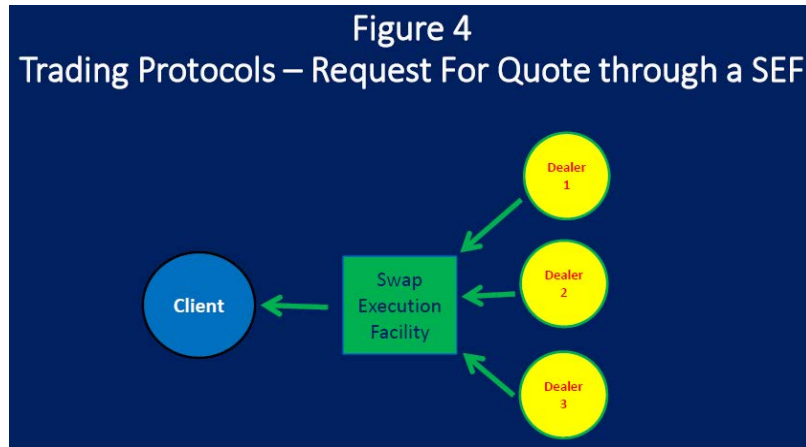
Figure 33: Trading protocols: request for quote (RFQ) before 2008



Source: ISDA.

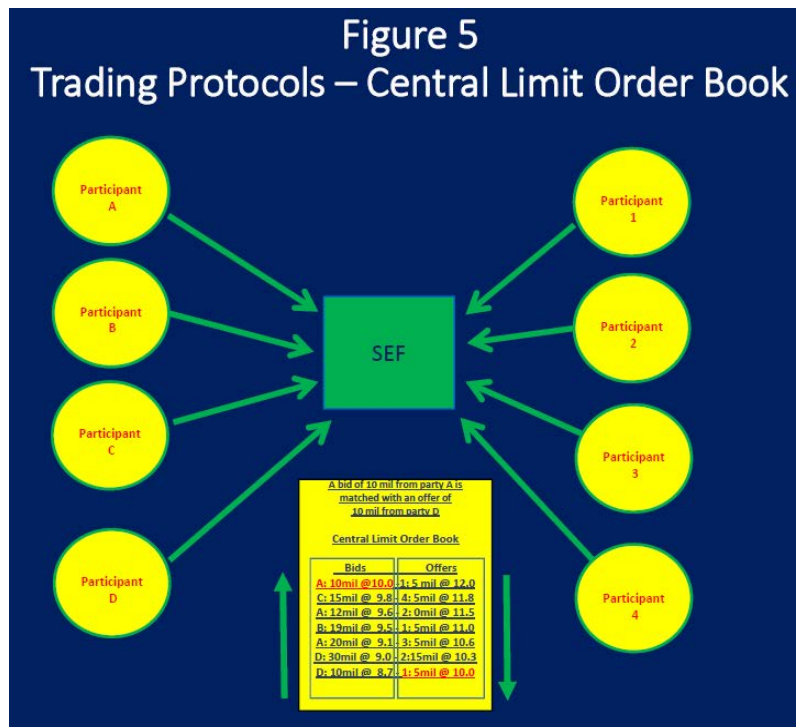
The introduction of the requirement to trade all standardised (and cleared) OTC derivatives on electronic trading platforms, has introduced new channels for executing such OTC derivatives transactions. The new regulations dictate that (some of) these transactions now have to take place on newly established (and regulated) entities – the electronic trading platforms - established for this purpose. At this time, the so-called Swap Execution Facilities (“SEFs”) have been established in the United States under CFTC rules. These rules dictate whether a party in an OTC derivatives transaction is required to trade on or off such platform, and for which products. They also specify the obligations of the platforms with regard to the execution protocol to be used, and aspects of post-trade processing. The rules allow for several trading protocols, including the RFQ (through a SEF – as depicted in Figure 34 below), and all-to-all quoting which gives rise to the so-called central limit order book, depicted in Figure 35 below.

Figure 34: Trading protocols: request for quote through a SEF



Source: ISDA.

Figure 35: Trading protocols – central limit order book



Source: ISDA.

Similarly, trade execution rules came into effect in Japan in September 2015, but the requirements to trade on electronic trading platforms are not wholly consistent with other jurisdictions.

In Europe, the trading obligation is due to come into force as part of MIFID II¹³², which, in addition to Regulated Markets (organised exchanges), and Systematic Internalisers (SIs), introduces multilateral trading facilities (MTFs) and organised trading facilities (OTFs) to the OTC derivatives landscape. The exact details of the rules and requirements for these execution platforms have yet to be fully defined. And, in addition to the challenges associated with supporting the so-called

¹³² See section, for more details regarding the trading obligation in MIFID/MIFIR.

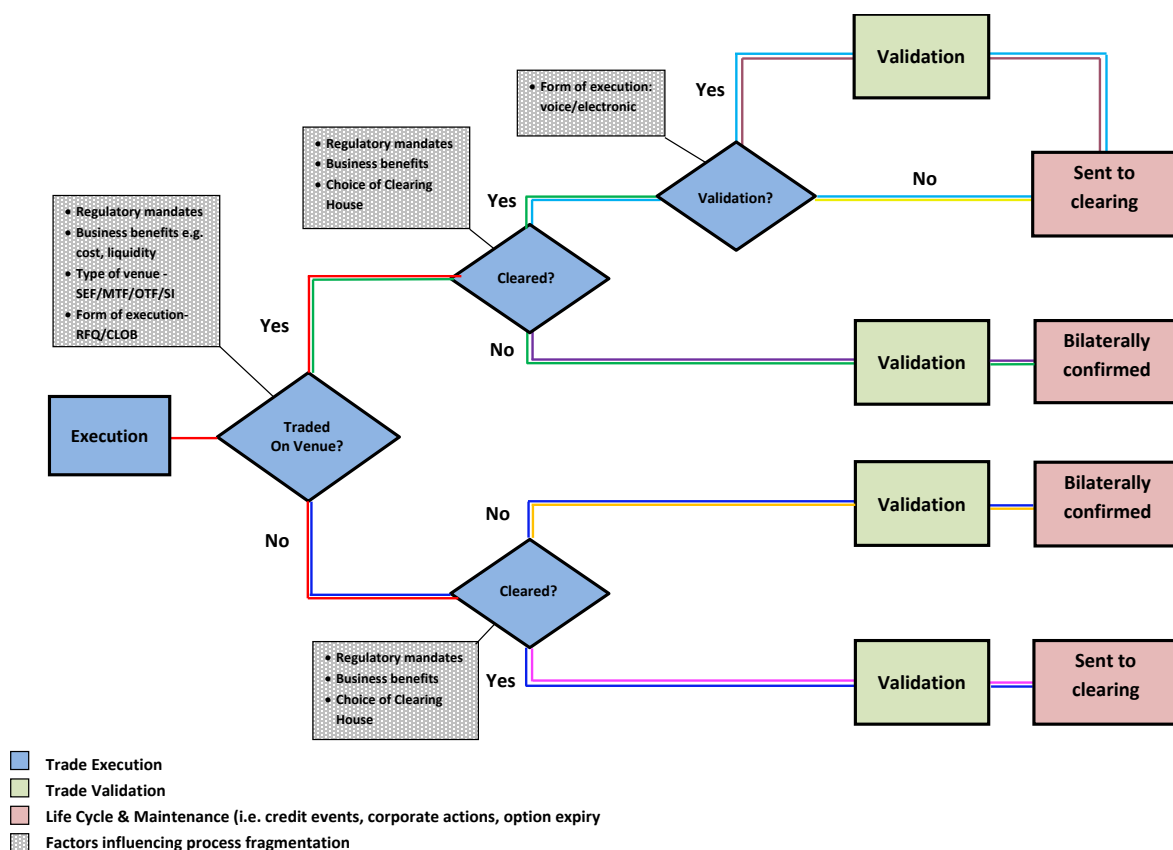
obligation to “trade on a trading venue” (ToTV), we anticipate similar challenges in the evolution of multiple additional process flows as platforms are established and have to interface with other post-trade activities.

Although the trading rules in Europe are yet to be finalised, the experience from observing the implementation of the trading obligation in other jurisdictions, indicates that as the post-trade processing rules have been implemented, a range of approaches to supporting such pre and post-trade functions has developed.

Undoubtedly, the choice of platforms and methods of execution available to market participants wishing to execute an OTC derivatives transaction will increase. Equally, however, the new trade execution venues represent additional points of entry of OTC derivative transactions into the post-trade environment. Inconsistencies in approaches adopted by these venues inevitably cause disruption to a relatively established, if not wholly adopted, post-trade processing environment. In addition, they proliferate the need for connectivity with the other market infrastructures, such as CCPs. All of the above lead to incremental levels of complexity in the process of trade execution as well the quantum of the post-trading activities involved, which is created either because, i) there is a new sets of entities (the regulated trading platforms/venues) with their own associated processes, standards, and on-boarding requirements, ii) compliance with associated regulatory requirements (which have led to a series of extraterritorial issues, i.e., how far the reach of the regulation of a specific jurisdiction is), iii) new required documentation, as well as iv) coming up to speed with all the new requirements and understanding how the new ecosystem works.

Figure 36 below, demonstrates the emerging complexity by depicting graphically the various functional steps involved in the associated post-trade process, and all the branches that emerge (along with a need to establish new processes). This figure should be contrasted with that of Figure 32 above, which summarised the process flows before the regulatory reform.

Figure 36: Core Post-Trade Process Flow Decision Tree



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Source: ISDA Whitepaper titled “The Future of Derivatives Processing and Market Infrastructure”, dated Sept 15, 2016.

Finally, there are a variety of new representations and legal agreements that need to be put in place in order to execute a transaction. Having means to make these representations and store the necessary output for re-use either at the point of trade or in the pre and post-trade process is critical for improved efficiency. To date there are mechanisms to facilitate some of this but more work needs to be done in this area.

5.3.6. The Mandatory Clearing of Standardised OTC Derivatives

One of the observations made in the reviews conducted in the aftermath of the 2007-8 crisis revealed that counterparty risk was heightened during the crisis, to the point that trading among parties came to a halt, out of fears about the other parties’ survivability. To address (and mitigate) counterparty risk in the context of the OTC derivatives activity, global policy makers elected to impose the clearing obligation, that is the obligation that every standardised bilateral OTC derivatives trade is intermediated (cleared through) a CCP.

As explained in the previous section (3.3 on clearing, and 5.1 on the clearing of ETDs), CCPs are financial market infrastructures that interpose themselves between two parties. In the case of the OTC derivatives, by superimposing a CCP in a bilateral derivatives transaction, the CCP receives (pays) the agreed upon cash flows associated with an OTC derivative from one party and agrees to pay (receive) the same cash flows to the other party. As such, the CCP always maintains a balanced (a matched cash flow) book of positions at all times and does not expose itself to market risk except if one of the parties default. This process typically takes place through one or more Clearing Members (CMs) of the CCP and it is through them that the parties of a CCP-intermediated transaction get access to the CCP.

At some level of abstraction, the clearing of the OTC derivatives is identical to that of cash instruments (such as equities), or ETDs, with all the associated benefits of mitigating counterparty risk, multilateral netting, risk management, operational efficiencies, and transparency gains. All these benefits are present in the case of OTC derivatives. In fact there is a significant additional benefit, which is central management of a counterparty default. In the bilateral OTC derivative market, the event of default of one party affects all counterparties bilaterally linked to the defaulter. In the cleared context, a similar event of default affects only the CCP, leaving all the other parties (and their positions) unaffected. The CCP, through the so-called porting process, can transfer the positions of the defaulter’s clients from the defaulted party to other CMs, avoiding the need to liquidate and replace such client positions. However, there are some aspects of the OTC derivatives, already identified in the discussion in the previous sections, which make their clearing different than that of other products. These are:

- a) The global nature of the OTC derivatives market;
- b) The decentralised nature of the OTC derivatives market;
- c) The absence of a single centralised point of trading and price formation;
- d) The more complex nature and long life of the underlying instruments.

The first two aspects concern the legal risk of the enforcement of a CCP’s rules across different jurisdictions. The second two aspects concern the limited price availability and liquidity of OTC derivatives which make default management challenging. The above have implications for the way CCPs manage risk and, most importantly the so-called Default Management process (DMP), which is the process deployed in the event that one or more of the CCP’s CMs default, causing the CCP to

have an unmatched book. The absence of a single centralised trading place potentially makes the DMP more challenging. Unlike the case of the other instruments (equities or ETDs), where in the event of a CM default, the positions of the defaulted CM (which give rise to an unmatched book for the CCP) can be quickly liquidated in the market, the absence of a centralised market makes such liquidation more challenging, requiring the establishment of other mechanisms (the auction) as well as additional contingency plans in the form of CCP Recovery and Resolution plans. In fact, this has led to the characterisation of most of OTC derivatives CCPs as systemically important entities.

In addition, unlike the case of the other instruments (equities or ETDs), which are typically traded in centralised trading infrastructures which are (in most cases) vertically integrated with the associated clearing infrastructures, the trading of OTC derivatives is done on a decentralised basis which is rarely linked vertically with the CCPs in which these products are cleared. As noted in the previous section, and highlighted by Figure 6, this provided a flavour of the multiple paths/channels through which a transaction can reach one or more OTC derivatives CCPs. Further complicating this picture is the fact that several of these channels may be cross-border as the major OTC derivative CCPs comprise CMs from several jurisdictions which may be subject to overlapping and not always consistent regulatory demands, and subject to different solvency regimes¹³³.

Finally, the more complex nature and long life of the underlying instruments puts additional demands on the CCP in terms of on-going risk management as well as demands for liquidity management arrangements above and beyond those required by the clearing of other products, with implications for post-trading as well, including the requirements to port, and segregate and manage collateral.

In the following, some of the characteristics of OTC derivatives are brought out and discussed.

5.3.6.1. Types of OTC Derivatives Cleared

Unlike ETDs, the clearing of OTC derivatives is a relatively recent phenomenon. OTC derivatives clearing started in 1999 when the largest participants of the OTC derivatives market - the OTC derivative dealers - started clearing their trades with each other at the London Clearing House (LCH), as a way to mitigate counterparty risk and increase capacity of the OTC dealer to deal with each other.

But clearing has become much more pervasive since the 2007-8 crisis, when regulatory reform called for the clearing of all standardised OTC derivatives. As a result, the current state of the market reflects to a large extent, primary regulatory developments, and is focused primarily on the most liquid OTC derivative asset classes which are the most standardised. The below lists these asset classes in an order reflecting the pervasiveness of clearing from highest to lowest:

- Interest rates: Interest rate swaps comprise the largest and most liquid part of the OTC derivatives market. As a result, mandated for clearing are interest rate swaps denominated in major currencies, but swaps denominated in other currencies are also being cleared, while options products (such as swaptions) are being considered. It is estimated that over 90-95% of the new interest swaps are already being cleared.
- Credit (indices and single names): Mandated for clearing are credit indices but single-name CDS are also being cleared (without mandate).

In addition, there is clearing of products that have not been mandated by regulation:

¹³³ See section 7 of this report for more information on the legislative and regulatory framework.

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- Commodities: Most of the OTC commodities derivatives contracts have been recast in the form of listed products to gain associated regulatory treatment – a case where the line between OTC and exchange-traded derivatives is beginning to be blurred.
- Equities: The majority of OTC equity derivatives transactions are bilaterally negotiated, but cleared through exchanges – yet another case where the difference between OTC and exchange-traded derivatives is blurred.
- FX products: NDFs (non-deliverable forwards) can be cleared on a voluntary basis.

5.3.6.2. Clearing Market Structure

It is already apparent from the discussion so far that the OTC derivatives regulatory reform is causing major changes in the way the financial services industry conducts this business which is causing the re-evaluation of the business models used. In this context, one of the many questions which dominates the thinking of OTC derivatives business leaders is whether clearing is:

- a. A new post-trade process associated with the conduct of the OTC derivatives business;
- b. Yet another variation in the post-trade process, and part of their existing cleared business model; or
- c. A new stand-alone business opportunity on its own with CCPs and CMs at the epicentre.

The outcome of this debate is still open as different participants are adopting different stances on these questions. As a result, the current structure of the market for clearing reflects the above trends. Broadly speaking, the clearing ecosystem comprises of the following constituents:

- CCPs: Currently, the clearing of OTC Derivatives has been undertaken by a few CCPs. As a result, it is extremely concentrated along the following lines:
 - Interest Rates: Dominated by LCH with presence by CME and to a lesser extent Eurex, ICE, NASDAQ, SGX and some other smaller national CCPs which concentrate on the clearing of the local currency denominated OTC derivatives
 - Credit: Dominated by ICE with presence by CME, LCH and to a much lesser extent others
 - Commodities: Dominated by ICE
 - Equities: In terms of OTC derivatives ICE and LCH dominate, but since equities also have a strong local character and the use of clearing is pervasive (particularly the multilateral netting element) , there are a number of local exchanges which are also present and active
 - FX: LCH and CME
- Clearing Members: These are the entities through which clearing participants (typically, end users) get access to CCPs. Currently this community comprises:
 - Participants from the OTC derivatives dealer community (primarily major US, European and some Japanese banks, about one dozen or so). Among those participants some view clearing as a post-trade activity complementing their OTC derivatives offering. Others (see below) have a different perspective.
 - Participants from the traditional clearing community which see this as an extension of their existing clearing business and an opportunity to expand it by leveraging cross-selling and cross-margin opportunities by adding OTC derivatives clearing to their offering. Interestingly, some of these participants are simply different divisions of the above banks.
 - New non-traditional participants (such as Citadel) who see this as an opportunity to enter this business.

Clearing Participants (users/clients): There is a wide spectrum of entities who are either already clearing, or likely to be clearing in the next 2+ years as the clearing obligation becomes effective in Europe and elsewhere¹³⁴. Especially small and medium-sized buy side users with a limited volume of clearing activity face difficulties to find clearing members and to set up legal and operational arrangements with them. The negotiation power of such financial counterparties is limited when interacting with clearing members. Furthermore, clearing members are less willing to offer client clearing services beyond their most important and biggest clients largely due to the stringent capital requirements applicable to them (e.g. BCBS Leverage Ratio).

It has been observed by the buy-side that the client clearing offerings provided both on the level of the CCPs and of the clearing members for the clearing eligible CDS products are not sufficiently broad enough in comparison to the requirements of the interest rate derivative market participants at large. The buy side fear that the limited client clearing offerings could cause bottleneck situations as all clients (UCITS/AIF) need to set up legal and operational arrangements with the CCPs and the clearing members at the same time. Furthermore, some clearing members do not offer a cost-effective client clearing model which is a good offer for the small and medium-sized buy side firms

5.3.6.3. The Requirement to Margin Non-Cleared OTC Derivatives

As mentioned above, yet another regulatory requirement with respect to OTC derivatives that came out of the G-20 summit in Pittsburgh in 2009, calls for the margining of significant portions of non-cleared OTC derivatives (non-financial institutions are mostly exempted from this requirement)¹³⁵, by imposing a requirement to post two-way initial margin (IM), and exchange variation margin on a daily basis. This new requirement – which went in to effect already on Sept 1, 2016 in the US, Japan and Canada, is expected to go into effect early 2017 in Europe and elsewhere – imposes new, significant and challenging post-trading processes.

As explained in section 5.2.1, collateralisation has been a feature of the OTC derivatives market almost since its inception. However, such collateralisation was an optional (if frequently used) feature, albeit of a significantly less burdensome nature than the new rules. As a result, the new near universal two-way margin requirement for the OTC derivative transactions which are not cleared creates the need for a significant number of new requirements ranging from:

- Incremental demand for collateral, estimated to be in excess of \$1 trillion (see section 6.4.1. below on potential collateral shortage discussion);
- Incremental need for portfolio reconciliation processes as the daily nature of the IM and VM exchanges leaves very little room for errors in ensuring that the two parties have the identical number of transactions between them;
- Need for new processing facilities to calculate collateral on a uniform basis (need for a standard IM model) so that the two contracting parties come up with the same collateral valuation;
- Need to put in place efficient dispute resolution processes to address any disputes in a highly efficient and timely manner;
- Need for new documentation in the form of new or modified CSAs to legally address the new requirements/need for exchanging both IM and VM;
- Need for new collateral processing facilities to deal with the large number of collateral calls and associated timely moves that the new collateral requirements will generate.

¹³⁴ See section 7 of this report for more information on who is subject to the Clearing Obligation in Europe. In the US, the clearing obligation has been in effect since 2012.

¹³⁵ For more details, see section 7 of this report.

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- Need to revise legal documentation to address certification needs associated with complying with the margining regulation (thresholds);
- New demands on existing infrastructures (custodians, collateral providers, collateral transformation and optimisation services), and
- Potentially other unanticipated consequences.

Of all the new regulatory requirements, this one is perhaps the most pervasive with respect to its potential impact on the OTC derivatives market post-trading environment. And it is too early to ascertain progress and/or its potential impact on the market, market structure, market participants and post-trading functions.

5.3.7. The reporting requirement for OTC Derivatives

As mentioned one of the commitments of the G20 Leaders' Statement from the Pittsburgh G20 Summit of 2009, under the banners of *strengthening the International Financial Regulatory System* and *improving over-the-counter derivatives markets*, was the agreement that *OTC derivative contracts should be reported to trade repositories*. Since then, various jurisdictions around the world have been effecting legislation to implement the necessary derivative trade data reporting regimes within their jurisdictions, to meet this commitment.

The reporting of OTC derivatives activity presents unique challenges because a) of the global nature of this activity which necessitates a consistent approach globally in order to obtain meaningful results in comprehensively capturing this activity. In addition, the very nature of the product, the way it is issued¹³⁶ and its flexible nature which changes over its life, presents a set of unique challenges for properly representing and capturing this activity. Further complicating this process is the fact that various jurisdictions around the world, have begun to implement the reporting requirement without proper consideration of the above considerations. As a result, the current situation could be best described as challenging for market participants, as different reporting regimes exist (and are in the process of being set up) with different formats or standards or required fields. In the following we provide a quick overview of these regimes with emphasis on the European scene which is the focus of this study.

The US was the first to put in place an OTC derivative transactions trade data reporting regime via Dodd Frank legislation and the implementation of reporting requirements by CFTC in 2012¹³⁷. Being the first jurisdiction to come up with reporting requirements, it set its own data requirements, and associated formats and standards. Noteworthy was the introduction of trade repositories (TRs) and the choice afforded to market participants in choosing the TR to which they could submit their transaction data.

Canada also has implemented or is in the process of implementing reporting in all its provinces/territories with requirements that are broadly similar to those of the US. In the Asia Pacific region trade data reporting has begun in:

- Japan to the Japan Financial Services Agency (JFSA)
- Hong Kong to the Hong Kong Monetary Authority (HKMA)
- Singapore to the Monetary Authority of Singapore (MAS)
- Australia to the Australian Securities and Investments Commission (ASIC)

¹³⁶ See section 5.2. of this report.

¹³⁷ Reporting to SEC has yet to be implemented as it is still being finalised. Moreover, it should be noted that the CFTC and SEC reporting regimes differ in scope but also in formats and types of data required to be reported.

5.3.7.1. European reporting

The EU has put in place perhaps the most comprehensive reporting framework¹³⁸ aimed at capturing activity to a) enhance the ability of regulators to maintain financial stability through the reduction of systemic risk, by monitoring exposures, b) to provide market transparency to market participants and regulators, and c) to police abusive or illegal conduct. The pursuit of this ambitious plan has resulted in a situation which is complicated by the fact that there are requirements for *multiple* reporting regimes, affecting the OTC derivatives markets either directly or indirectly in multiple ways. While these requirements have different aims, they have considerable overlap in both scope and data formats, but they are not identical. As a result, additional significant time, cost and effort is added in their implementation which could be avoided by better harmonising them. Examples of such regimes¹³⁹ are:

- **MAR:** The *Market Abuse Regulation* requires data to be reported which should align with data formats of other regimes where possible.
- **Short Selling Regulation (SSR):** This requires firms to report short sales to competent authorities if trading results in short positions in shares and sovereign debt (including positions effected by credit default swaps in sovereign debt).
- **SFTR** (*Securities Financing Transaction Regulation*): Which requires reporting of repo and financing transactions which ideally would leverage processes and data formats of existing reporting regimes and exempt products subject to SFTR from reporting under MiFIR.
- **MMSR:** This is an initiative by the ECB to gather *Money Market Statistical Reporting* data on money market trades including in their definition repos and interest rate derivatives and FX swaps. Starting in April 2016 this applies to Eurozone banks which are deemed to be *Reporting Agents* and will have been notified by their national central bank already but this may expand to other institutions interconnected in the Eurozone.
- **Sterling MM Data Collection:** The Bank of England's equivalent to MMSR for Sterling contracts.
- **REMIT:** The Regulation on wholesale Energy Markets Integrity and Transparency requires reporting of wholesale electricity and gas contracts to the Agency for the Cooperation of Energy Regulators (ACER).
- **EMIR:** This requires the reporting of all derivative contracts. It came into effect in February 2014 to enable prudential regulators to analyse systemic risk in OTC derivative markets.
- **MiFID II/MiFIR:** Due January 2017 (delayed to 2018) – this regulation and recast directive has reporting of trade data close to execution time for transparency purposes, transaction reporting to allow regulators to monitor market abuse and other reporting requirements which are intended to provide statistics to the market on best execution.

Across Europe, there is a lack of harmonisation of the various trade data reporting regimes which are at various stages of implementation. In their effort to implement the various reporting regimes, ESMA, ECB and other relevant competent authorities have issued/included specific formats and requirements in the regulatory technical standards (RTS). However, since the process of modifying such RTSs is very cumbersome in Europe, and the state of such formats is still fluid (in view of the CPMI-IOSCO efforts to standardise such formats globally), there is very limited flexibility to react or align them with any future developments.

¹³⁸ See section 7 for more detailed information on the legislative and regulatory requirements of each of these regimes.

¹³⁹ See section 7 for more detailed information on the legislative and regulatory requirements of each of these regimes.

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Moreover, there are examples of *overlap* between regimes which cause lack of clarity regarding the scope of each regime. For example,

- Securities financing transactions which are exempt from SFTR (due to the type of counterparty) are then subject to MiFIR transaction reporting.
- Trades already reported under EMIR are not required to be reported under REMIT – though venues which are obliged to report under REMIT may have no knowledge of a trade’s dual status without knowing full details about parties to a trade.
- Since there are multiple reporting requirements across different regimes under ESMA’s authority, ideally they should be viewed as different “cuts” of the same data set. This is not the case currently, giving rise to challenges for participants subject to such requirement.
- The global nature of the OTC derivatives market calls for consistent formats and standards, an effort currently under way by CPMI-IOSCO on global data harmonisation and standards for identifiers. Yet, due to timeframes set out in the original MiFID II/MiFIR legislation, ESMA’s prescriptions in the MiFID RTSs are setting standards before the CPMI-IOSCO is finished (e.g., requiring ISINs for instrument identification in MiFIDII/MiFIR). Likewise and again perhaps understandably, ESMA is proposing changes to the EMIR reporting regime which are not waiting for CPMI-IOSCO guidance on UPI and UTI.

The impact of the above can be significant as they multiply implementation efforts and drive up costs. Participants must reinterpret things multiple times and repeatedly do gap analysis for new developments and change their IT build multiple times to effect all the changes. Market participants are challenged to test their builds across various RTSs and possibly against what they think the future state will be¹⁴⁰.

5.3.7.2. Global data harmonisation efforts by CPMI-IOSCO

The result of the lack of global standards has been an uneven reporting of the OTC derivatives activity, relatively poor quality in the reported data and more broadly, data which cannot be easily consolidated globally¹⁴¹. Poor data quality reduces their value to regulators and limits their ability to fulfil their regulatory tasks. Lack of standardisation and differences in requirements across jurisdictions increase the risk of misinterpretation and the cost for reporting parties that have reporting obligations in multiple jurisdictions. This need has been recognised and the highest level and FSB, CPMI and IOSCO have taken a number of steps in the right direction. Specifically, CPMI-IOSCO is running a data harmonisation project focussing on Unique Trade Identifiers (UTI), Unique

¹⁴⁰ It is understood that it is unrealistic for one to expect rules to remain static. Some remediation work is to be expected (and is typically anticipated and built in to any programme budget). But, ideally, regulators should have a clear vision and begin their rule making with data harmonisation in mind.

EMIR is yet another example of a technology project, of which the proposed amended EMIR reporting RTS will be a huge change to the EMIR reporting technology firms have in place. It is likely to be implemented at the end of 2016 or early 2017. It will be the 3rd major change firms have had to consider and implement to the EMIR reporting technology since go live in Feb 2014. (The other two being the implementation in two stages of data validation – the latter of which fundamentally changed the way certain TRs allows firms submit reports).

More broadly, due to tight legislative timeframes and the large scope of the reforms, market participants are concerned that ESMA is not given the time in developing technical standards and to properly access the relevant industry experience for the purpose of understanding how disruptive policy changes may be from a technology and costs point of view.

¹⁴¹ Legal restrictions have emerged as yet another source of issues preventing the consolidation of data collected by trade repositories located in different jurisdictions with differing privacy and data protection legislations.

Product Identifiers (UPI) and other critical data elements which are important trade data to report¹⁴².

There is an urgent need for the regulatory reporting requirements for OTC derivatives transactions to be harmonised within and across borders. Toward this end, regulators around the world should identify and agree on the trade data they need to fulfil their supervisory responsibilities, and then issue consistent reporting requirements across jurisdictions.

In addition, policy-makers should embrace and adopt the use of open standards – such as legal entity identifiers (LEIs), unique trade identifiers (UTIs), unique product identifiers (UPIs) and existing messaging standards (e.g. FpML) – to drive improved quality and consistency in meeting reporting requirements. Unique global identifiers for legal entities conducting a trade (LEIs), for product types (UPIs) and for trades (UTIs/unique swap identifiers) have been developed. They should be expanded as necessary and their use should be adopted across reporting regimes. The governance of such standards should be transparent and allow for input and review by market participants, infrastructure providers and regulators. Access to the standards, licensing and cost factors should be carefully considered.

5.3.7.3. Impact of the reporting obligation on post-trading

The reporting of the OTC derivatives was a key objective of the G-20's Pittsburgh summit and a way for regulators to monitor the build-up of systemic risk. Despite an avalanche of new requirements, it is clear that key objective of monitoring systemic risk has yet to be met on a global basis. Regulatory requirements have been inconsistently developed in different jurisdictions, making it impossible to get a truly global picture of this market. In fact, it is questionable whether an accurate picture even exists at a jurisdictional level.

The reporting obligation presents a particularly challenging situation given the global nature of the OTC derivatives market, the existence of multiple trade repositories, and the fact that different jurisdictions have come up with different requirements and different standards which make the collection, consolidation and interpretation of reported derivatives data extremely challenging, if not impossible. Most importantly, because reporting requirements are disconnected from the way many market participants currently represent transactions in their systems, it adds yet another layer of complexity in the already increasing complex post-trade processing environment which has resulted from the introduction of the trading and clearing obligation (captured in Figure 6). And that environment does not attempt to capture the added processes produced by the imposition of the margin requirements which are only beginning to be assessed.

The role of regulators in assisting, and in many cases becoming catalysts for, change in the form of standardisation should not be underestimated.

5.3.8. Future trends

The above discussion speaks to the breadth and depth of the OTC derivatives regulatory reform which is reshaping the structure and the nature of the OTC derivatives market, the way this market trades, its market structure, the number and diversity of its participants, as well as the introduction

¹⁴² Market participants have provided significant input to this process by responding to the consultations. ISDA in particular, has provided key inputs to the UTI and UPI discussions as global harmonisation of these identifiers should be the starting point for any new regimes or changes to incumbent ones. Moreover, ISDA published a set of for data reporting in the context of OTC derivatives. See www.isda.org.

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5. Derivatives

of new participants. All the dynamics have (and likely to continue to do so) a significant impact on the current post-trade process.

In the discussion of the various aspects of the OTC derivatives markets and associated post-trade functions, an effort was made to tease out and sketch some of these changes, as well as attempt to identify some of the new emerging trends. In the following, we summarize and further expand on those thoughts following the structure of this section, namely, in terms of market structure, competition, participants (existing as well as new entrants), the new market infrastructures, and above all, the possibilities for addressing the challenges posed by all the changes on post-trading activities.

1. **Market Structure:** The traditional decentralised dealer network continues to form the basis of the OTC derivatives market structure, as these dealers continue to be the main sources of market liquidity by being ready to quote to their clients (the so-called market making). However, it should be noted that there are signs of change:
 - a. **Reduction in the number of dealers:** The regulatory reform, particularly in the form of new capital requirements (Liquidity Coverage Ratio, Net Stable Funding Ratio, Leverage Ratio, the Fundamental Review of the Trading Book (FRTB) and others) are impacting directly the ability of the dealer banks to make markets in OTC derivatives, by significantly impacting the cost of doing business. The cost of complying with the additional regulatory demands (compliance with trading, reporting, clearing obligations and others) also has increased the cost of doing business. The result has been that a number of banks/dealers have left the business.

This has been especially true of small and medium-sized buy side users with a limited volume of clearing activity that face difficulties to find clearing members and to set up legal and operational arrangements with them.
 - b. **Potential new Entrants:** We observe that a new class of participants is emerging, in the form of the so-called high frequency/algorithmic traders. In a repeat of what has occurred in other liquid markets (equities, ETDs, government bond markets – cash and futures), the more liquid part of the OTC derivatives market is attracting new entrants with different business models, based more on the provision of highly time dependant liquidity. Typically, such participants are very active participants in the market place during the trading hours and return to flat position with limited (if any) balance sheet utilization at the end of the trading day.
2. **Trading platforms:** The introduction of the obligation to trade on electronic platforms and the all-to-all trading protocol has the potential to accelerate the trends observed in the market structure. Although the RFQ trading protocol is currently the dominant form of electronic trading execution, there are also signs that the all-to-all trading protocol is beginning to attract increasing trading volumes. More broadly, the combination of the clearing obligation (which largely removes any concerns with respect to the quality of the other party) with the trading obligation, potentially opens the OTC derivatives market to a wider set of potential users wishing to utilise these products for hedging or other purposes.
3. **Clearing:** Potential future trends with respect to clearing are discussed in terms of: a) client activity, b) Clearing Member activity, and c) CCP activity.

-
- a. Clients: With respect to client activity, the impact of the clearing obligation on client business seems to be cutting both ways. On one hand, while credit concerns are mitigated by opening up the OTC market to a potential wider set of users, some new users may be put off by the additional costs associated with clearing in the form of new documentation costs, new clearing fees, and incremental funding and operational requirements caused by the IM and VM requirements which are associated with clearing.
 - b. Clearing Members: Changes are also observed among Clearing Members. Overall, there seems to be a reduction in the number of CMs, particularly those who offer client clearing services, as the impact of the capital reform (especially the leverage ratio) seems to have a negative effect on the clearing business. According to others, another reason (reinforced also by the leverage ratio concerns) is through the current low (to negative) level of interest rates¹⁴³. Yet, another set of factors seem to be the still unsettled questions of whether clearing is viewed as a stand-alone service to be provided at full cost by specialised providers. Or is it a post-trade function supported by existing clearing set-ups wishing to fully leverage their operational set-ups, and cross-margining opportunities? Or is it a post-trade function to be integrated by existing OTC derivatives dealers who wish to leverage cross-margining opportunities between cleared and non-cleared OTC derivatives products, particularly after the margining obligation goes fully into effect? Each of these possible directions has implications for the associated post-trading environment.
 - c. CCPs: Currently, there is more than one CCP actively clearing each of the OTC derivative asset classes (rates, credit, etc.). While competition is welcomed by market participants (both in terms of cost reduction and innovation), proliferation of CCPs leads to increasing margin/collateral fragmentation increasing funding costs for participants, and leading to market dislocations either as a result of different practices (differences in IM practices), or simply demand and supply. Again, there are implications for the associated post-trading processes.
4. Reporting: Strictly speaking the reporting requirement is not likely to lead to any significant changes in the market or its market structure. Yet, the complexity and the cost associated with this obligation is acting as a deterrent either for those wishing to use these products, or to existing players who are faced with increased costs to comply with this regulations. However, the need to comply with this obligation is likely to stimulate the entry of new players wishing to participate and compete in the provision of these services. Also, as more and more data become available, it is likely to prompt the emergence of another cottage industry focusing on developing applications for using such data with possible beneficial effects for post-trading processes
 5. Margining of non-cleared OTC derivatives: The requirement, when fully implemented, has the potential to be a catalyst for big changes and impact on both the OTC derivatives business, its market structure, as well as the many post-trade processes. The first phase of the margining requirement is already into effect in certain jurisdictions (North America, Japan and Canada) and it is providing us indications as to some likely developments:

¹⁴³ Interest earned on the margin balances held on client accounts traditionally has been a significant source of revenue for clearing members. Such balances, on one hand attract very punitive capital charges through the leverage ratio if held on their balance sheet, while generating very little (if any) interest income.

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- a. There are significant documentation requirements associated with the full implementation of this obligation. Although ISDA has issued a number of protocols¹⁴⁴ designed for the efficient transitioning from existing CSAs¹⁴⁵, to the new, amended ones, the sheer volume of re-papering (estimated in the tens if not hundreds of thousands of legal documents that need to be updated) is very large.

Alternatively, market participants can use national master agreements beyond the IMA.

- b. The requirement – either in its IM, VM or both form – is likely to create significant additional operation processes (and associated costs) for a large numbers of existing users who, previously, did not have any (or had only very limited) collateralisation needs or requirements.
 - c. The requirement for new collateral processing and custodian services: The need to keep initial margin segregated creates a new need for 3rd party custodians to safe keep such collateral. Collateral processing, due to the high frequency and quantum involved is likely to put strain on existing systems, implying the need for more streamlined and efficient systems to be built.
 - d. The need to calculate initial margin in a similar manner by the two parties involved in a bilateral OTC derivatives transaction, has already led to an industry-led effort to produce a standardised model for calculating initial margin¹⁴⁶. This model has been approved by regulators in other jurisdictions at the firm-level and is currently being used globally, with users having to maintain similar validation and testing standards to internal margin models. Moreover, the implementation and use of this model still requires a number of operational steps, including portfolio reconciliation, ensuring that transactions are classified consistently among asset classes, and the resolution of disputes which may emerge for a multitude of reasons. All these processes are new and need to be involved, fully tested and stabilised. It remains to be seen whether the processes being built are resilient enough when large numbers of participants are subject to the margining obligation, in subsequent phases. In terms of initial margin amount, the G20 objective of promoting clearing means that margin requirements calculated on uncleared trades, regardless of what model is used, should be at least on average higher than the requirements if trades were cleared through a CCP.
6. RegTech and FinTech¹⁴⁷: The large number of changes in the post-trade environment induced by regulatory change is creating opportunities for the broader financial technology (FinTech) community to create applications and offer services which drive efficiencies and cost reductions. As a result, many FinTech companies are emerging across capital markets. It remains to be seen what the impact of these newcomers will be.

Of particular interest in the FinTech space may be the opportunities for blockchain or distributed ledger technology (DLT). DLT is currently gaining a significant amount of attention, and many

¹⁴⁴ Interest earned on the margin balances held on client accounts traditionally has been a significant source of revenue for clearing members. Such balances, on one hand attract very punitive capital charges through the leverage ratio if held on their balance sheet, while generating very little (if any) interest income.

¹⁴⁵ See section 5.2.3.1 on documentation.

¹⁴⁶ The industry effort to produce the standard model – called the ISDA SIMM – was spearheaded by ISDA. See www.isda.org for further details.

¹⁴⁷ The nametags “RegTech” and “FinTech” as well elements of this section, appear and draw heavily from ISDA’s Whitepaper titled “*The Future of Derivatives Processing and Market Infrastructure*”, dated Sept 15, 2016.

traditional market participants are collaborating and gathering around this technology, either through involvement in consortiums and/or exploring their own initiatives internally. In particular, the development of smart contracts has the potential to disrupt many existing post-trading activities in the OTC derivatives market. Yet, it is too early to ascertain whether such technologies will have an impact in the foreseeable future.

The cumulative result of these changes is likely to be significant. Already many market participants are rethinking their traditional roles and involvement in the OTC derivatives markets. The industry has already seen examples of firms stepping away from less profitable areas, for example some notable investment banks have stopped providing clearing member services for their customers in some jurisdictions, potentially leading to lack of access to clearing by smaller participants (as everyone has to go through a clearing member to clear through a CCP). Others have reduced or are considering reducing their footprint in certain asset classes. To this end it is clear that the role of banks as intermediaries in the global market is changing. It remains to be seen how.

6. Collateral management

6.1. Description

6.1.1. Importance of collateral to financial markets

Collateral plays a key role in the fabric of financial markets, and the ability to move collateral efficiently between counterparties, markets and accounts is paramount for the adequate functioning of financial markets.

As one of the main risk mitigation tools throughout the financial system, collateral is key to the following types of transactions¹⁴⁸.

- Funding by banks from central banks, other banks, and broker dealers;
- Regulatory capital requirements for transactions under, for example, Basel III;
- Funding by fund managers via prime brokerage firms;
- Derivatives transactions (through the posting of initial and variation margins for bilateral and centrally cleared OTC derivatives transactions);
- Members' participation and contribution to CCP and CSD risk management;
- Securities financing agreements (i.e. securities lending and borrowing, repo and reverse repo).

6.1.2. Collateral assets

Collateral can be cash or non-cash. What constitutes non-cash collateral can be broad and varied, and, in theory, could be any cash-funded financial (or even non-financial) security that is liquid, easily priced, and where title can be transferred. This could include government, agency, covered and asset-backed bonds, bills, equities, bank loans, highly regulated investment funds (e.g. UCITS) including also ETFs, and even commodities, such as gold.

Among collateral types, it is important to distinguish between collateral types which are readily usable for a variety of purposes (usually high grade collateral) and collateral which is specific in nature, can be exchanged and accepted only in specific circumstances:

- Usable collateral (usually investment grade) is more readily acceptable by collateral takers. It can be further divided into High Quality Liquid Assets (HQLA), which fall under the Level 1 and Level 2 definitions of the Basel III Liquidity Coverage Ratio (LCR), and the broader High Quality Assets (HQA), which is effectively defined by the market acceptability of collateral takers.
- The broadest definition of usable collateral (Collateral Assets), however, could be extended to cover any security that can be pledged in a collateralized funding transaction, or, alternatively, repo-ed in a securities financing transaction (SFT)¹⁴⁹.

6.1.3. Collateral management¹⁵⁰

“Collateral management” (also known as ‘collateral management arrangements’) includes the full chain of actions and processes of valuing, allocating, exchanging and maintaining collateral (including the verifying and providing of collateral).

¹⁴⁸ IOSCO Securities Markets Risk Outlook 2016

¹⁴⁹ International Capital Market Association (ICMA) study Collateral is the New Cash]

¹⁵⁰ From Cogesi paper on collateral management – June 2014

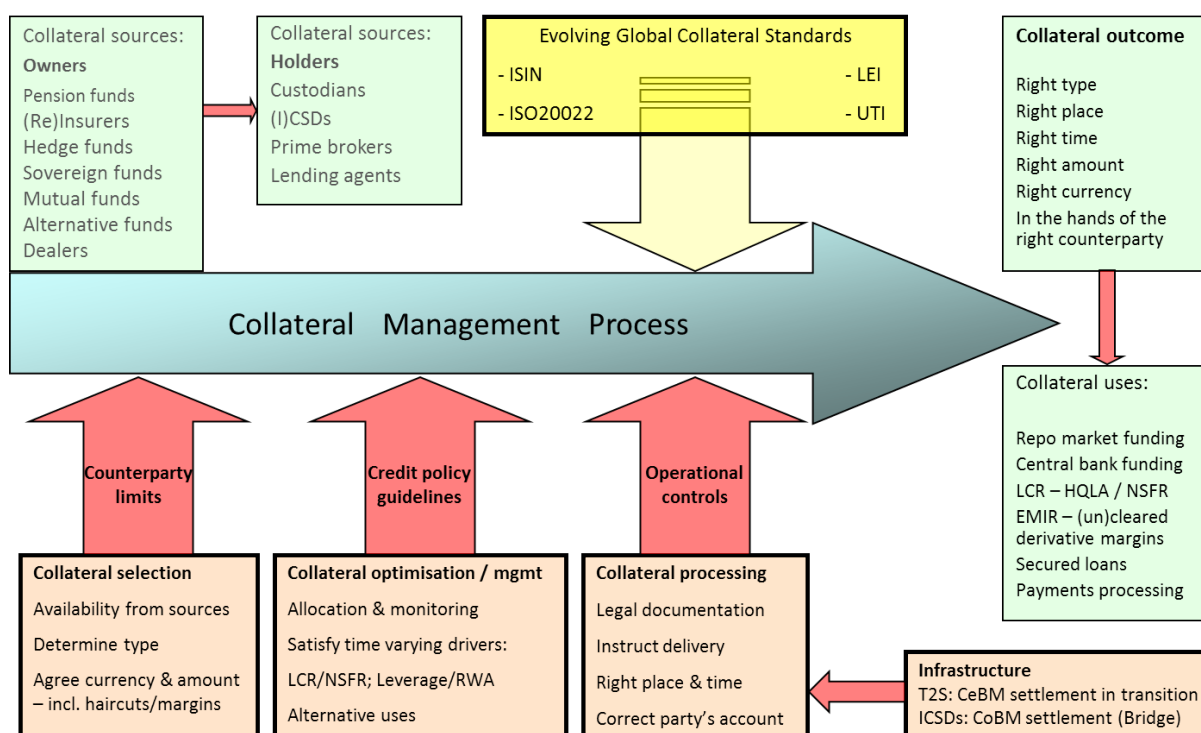
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This encompasses all post-trade processes and arrangements (by market infrastructures and other service providers) and other activities to ensure that a firm can meet its various collateral obligations and reduce its counterparty credit risk exposures. It involves frequent multilateral interactions between different providers of collateral management services, such as custodians and financial market infrastructures (such as (I)CSDs and CCPs).

Collateral management is a distinct activity from securities and cash settlement, even if it uses the same market infrastructures as for securities or cash settlements. Specifically, it has its own legal construct, product definitions and post-trade lifecycle. Within the collateral products there is event management that is required such as substitutions, revaluation and pricing. Furthermore collateral movements have to be identified and tracked, margins have to be processed and collateral has to be available in the right location to be used or returned when needed.

Figure 37: Collateral Management Process



Source:ICMA.

6.1.4. Collateral processes (relevant for post-trade)

The Collateral manager performs a number of tasks and processes:

- Define the collateral profile: receive from the collateral taker the precise definition of the collateral that he accepts: i.e. credit rating, type of securities (plain vanilla bonds, asset backed securities, equities, loans, etc.), type of issuer (government, supranational, corporate), currency, country of issuance, duration, concentration, haircut or margin in function of the quality of the assets
- Identify in the pool of available assets of the collateral giver, the ones that match the collateral obligation of the collateral giver: based on the profile, the size of the funding provided by the collateral taker, the market value of the assets used as collateral and the haircuts/margin,

- The assets selected will then either be earmarked in the securities account of the collateral giver, or moved to a separate “collateral account” of the collateral giver. In the case of repo transactions the selected assets are transferred to the account of the collateral taker.
- Monitor that the value of the collateral provided by the collateral giver always equals or exceeds its collateral obligation. The value of the collateral constantly fluctuates based on market movements and may fluctuate if the asset quality changes (e.g.: credit rating change). Request additional collateral when needed or select additional collateral from the pool of available assets of the collateral giver.
- Monitor that the quality of the collateral provided always corresponds to the profile defined by the collateral taker. Request or effect collateral substitution when quality criteria are no longer met.
- Support the collateral giver whenever they need to replace securities given as collateral by others, for example when the collateral giver wants to sell securities currently used as collateral.
- Performs a number of tasks when CCPs trigger margin calls or margin adjustments
- Provide asset-servicing services on the assets used as collateral.
- Closing of repo/stock loan where assets/collateral is swapped back

For more specific info on repo processes, please see the repo section 7.2.1 below.

6.1.5. Legal structures

While there are a variety of legal structures associated with the provision of collateral, two main categories are distinguished, by *Directive 2002/47/EC of the European Parliament and the Council of 6 June 2002 on financial collateral arrangements* (FCD):

(1) **Security financial collateral arrangement (or “security transfer”)**, which means an arrangement under which a collateral provider provides financial collateral by way of security to or in favour of a collateral taker, and where the full or qualified ownership of, or full entitlement to, the financial collateral remains with the collateral provider when the security right is established.

(2) **Title transfer financial collateral arrangement (or “title transfer”)**, which means an arrangement, including repurchase agreements, under which a collateral provider transfers full ownership of, or full entitlement to, financial collateral to a collateral taker for the purpose of securing or otherwise covering the performance of relevant financial obligations. Examples of title transfer arrangements are the Global Master Repurchase Agreement (GMRA)¹⁵¹ and Global Master Securities Lending Agreement (GMSLA).

One key difference between the two legal structures is related to the capacity of the collateral taker to use the collateral:

- Where an instrument is provided through outright transfer of title, this implies a proprietary right for the collateral taker to *(re)use* the assets.
- By contrast, in the case of a security financial collateral arrangement, the collateral-taker does not automatically have a right to use the collateral in circumstances other than a default. However, under Article 5 of the FCD it is possible for the collateral-giver to grant a right of use (sometimes referred to in the market as a *re-hypothecation* (or re-pledging),

¹⁵¹ GMRA is a model legal agreement designed for parties transacting repos and is published by the *International Capital Market Association (ICMA)*, which is the body representing the bond and repo markets in Europe.

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which allows the collateral taker to use the collateral at his discretion. If the collateral giver grants a right of use to the collateral taker, the collateral giver retains the ownership but only until the collateral taker exercises his right. When the right of use is exercised, the collateral giver loses his title to the collateral, which is transferred to the third party to whom the collateral has been re-hypothecated. Instead, the collateral giver is then given a contractual right to the return of fungible collateral. The exact extent and conditions governing such rights over the collateral are defined by the relevant collateral arrangement.

The Securities Financing Transaction Regulation (SFTR) sets additional conditions for the re-use of collateral, particularly a disclosure of risks and consequences, the prior consent of the collateral provider in the case of security financial collateral arrangements, and the debiting of the collateral provider's account. Art. 16 (8) of MiFiD II entirely prohibit the use of title transfer techniques in the relationship to private clients. Further restrictions in relation to transactions with professionals may emanate from the draft implementing directive (replacing Directive 2006/73). In addition to the characterisation of collateral transfer (title transfer vs security interest), of equal relevance is the analysis of the insolvency regimes relevant to the transaction.

This is of particular importance to participants who conduct cross-border business given the implications for regulatory capital and large exposure requirements.

Especially for cross-border transactions, (different) collateral ownership rights and safekeeping arrangements are important for legal certainty in case of insolvency. Also close-out netting arrangements are relevant in insolvency. These topics are covered in the main part of the EPTF report

Further information on application of different regulations on collateral (including disclosure requirements can be found in section 7).

6.1.6. Repo/reverse repo

6.1.6.1. What is a repo¹⁵²

Repo is the generic term for repurchase agreements and sell/buy-backs.

In a repo, one party sells an asset (usually fixed- income securities) to another party at one price at the start of the transaction and commits to repurchase fungible assets from the second party at a different price at a future date or (in the case of an open repo) on demand. If the seller defaults during the life of the repo, the buyer (as the new owner) can sell the asset to a third party to offset his loss. The asset therefore acts as collateral and mitigates the credit risk that the buyer has on the seller.

Although assets are sold outright at the start of a repo, the commitment of the seller to buy back fungible assets in the future means that the buyer has only temporary use of those assets, while the seller has only temporary use of the cash proceeds of the sale. Thus, although repo is structured legally as a sale and repurchase of securities, it behaves economically like a collateralised loan or secured deposit (and the principal use of repo is in fact the borrowing and lending of cash).

¹⁵² ICMA frequently asked questions on repo – December 2015.

Figure 38: Example of a repo transaction



Source: ICMA/ISLA.

The difference between the price paid by the buyer at the start of a repo and the price he receives at the end is his return on the cash that he is effectively lending to the seller. In repurchase agreements, this return is quoted as a percentage per annum rate and is called the repo rate. Although not legally correct, the return is usually referred to as repo interest.

6.1.6.2. How is repo used?

Repo performs four basic functions, which are fundamental to the efficient working of many other financial markets.

1. One party can invest cash and earn interest against the security of the asset provided as collateral --- safe investment.
2. The counterparty can borrow cash to finance a long position in the same asset, in amounts and at prices that reflect the security provided to the lender --- cheap borrowing.
3. One party can earn a return by lending out an asset that is in demand in the market, in exchange for cheap cash, which can be used for funding or reinvested for profit ---yield enhancement for securities investors
4. The counterparty can borrow an asset in order to cover a short position --- short covering.

For lenders of cash (repo buyers), repo offers a safe investment because:

- The buyer receives collateral to hedge his credit risk on the seller.
- The buyer can diversify his credit risk by taking collateral issued by a third party whose credit risk is uncorrelated with the credit risk of the seller.
- Collateralisation cannot only reduce the credit risk arising from lending but can also mitigate the liquidity risk. Where a buyer is given liquid collateral, he can meet any unforeseen need for liquidity during the life of the repo by selling the collateral to a third party, either through another repo or an outright sale (he would, of course, subsequently have to buy the collateral back in order to be able to return it to repo counterparty at the end of the repo)

For borrowers of cash (repo sellers), repo offers a cheap and potentially more plentiful source of funding, because the collateral they provide to the lenders (repo buyers) reduces the risks to the latter.

For lenders of securities (repo sellers), repo offers a means of generating incremental income, as in the securities lending market.

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For borrowers of securities (repo buyers), repo offers an alternative or supplement to the securities lending market, particularly for fixed-income securities.

Central banks use repo to conduct routine monetary policy operations and to provide emergency liquidity to the market in times of crisis. Repo mitigates their credit risk and connects them to an active interbank repo market through which liquidity can be efficiently redistributed to other banks and non-banks.

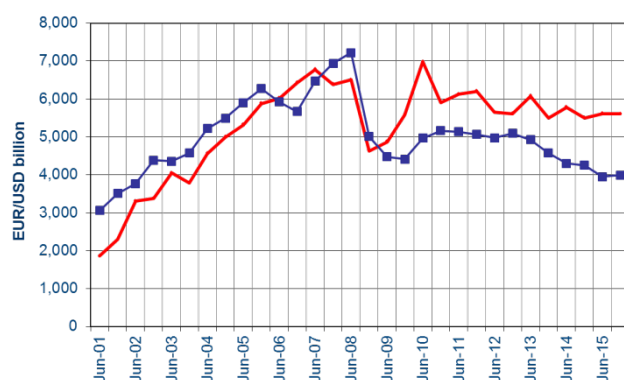
Repo is essential in the primary securities market. It allows dealers to fund their bids at bond auctions and underwriting positions in syndicated bond issues at reasonable cost, as well as to hedge their underwriting risk by taking short positions, thereby providing cheaper and less risky access to the capital markets for issuers.

In the secondary securities market, market makers need repo to fund their inventory and, where there is no inventory or it has been exhausted, to cover the temporary short positions created by sudden customer purchases.

6.1.6.3. Size of the repo market

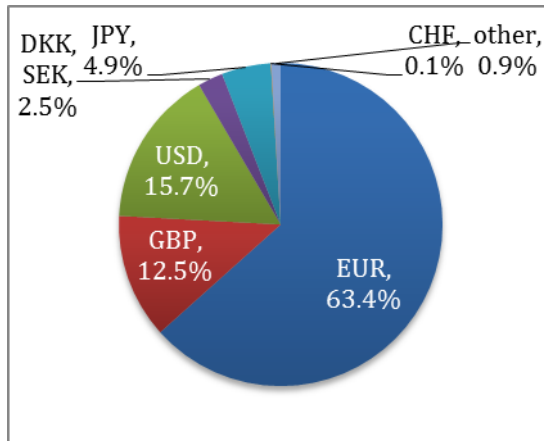
The ICMA's semi-annual survey of the European repo market in December 2015 produced a figure of about EUR 5.6 trillion in terms of repo contracts outstanding. This compares with the US Federal Reserve report of outstanding repo business of its primary dealers (who may account for as much as 90% of the US market) as almost EUR 4 trillion.

Figure 39: Historical evolution of the total size of the European repo market outstanding (red line) compared with US Federal Reserve repo activity (blue line)



Source: ICMA's semi-annual survey of the European repo market in December 2015.

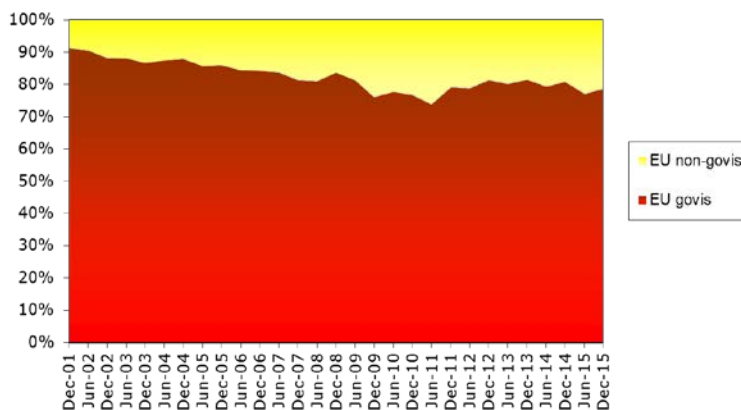
Figure 40: Split of outstanding repos by currency



Source: ICMA’s semi-annual survey of the European repo market in December 2015.

More than 60% of the outstanding repos in the European area are in EUR.

Figure 41: Split by types of collateral



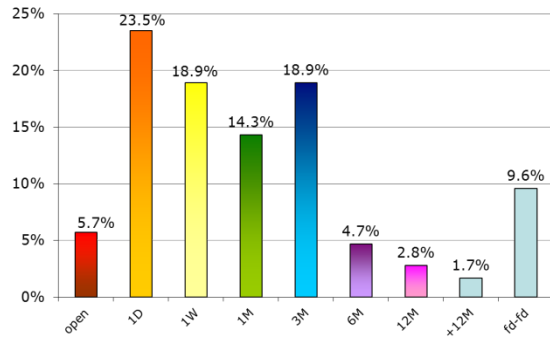
Source: ICMA’s semi-annual survey of the European repo market in December 2015.

The ICMA’s semi-annual survey of the European repo market estimates government bond collateral to account for about 80% of EU-originated repo collateral. The second segment is composed of “high-grade” bonds issued by supranational institutions and agency issues. Private sector assets (corporate bonds, equities, covered bonds, asset-backed securities, ...) form the smallest segment of the repo market.

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Figure 42: Split by maturity



Source: ICMA's semi-annual survey of the European repo market in December 2015.

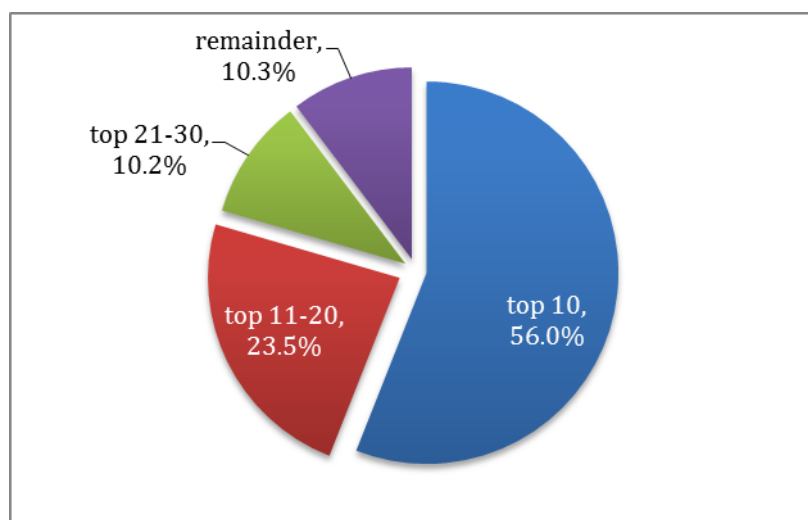
Traditionally, repos have been short-term instruments and the bulk of liquidity is still relatively short-term. The maturity distribution of the European market is longer than the US one and has been lengthening. The ICMA survey of the European repo market shows that the proportion of short-dated repos (terms of one month or less) has decreased from two-thirds of the outstanding to about half.

An open repo (also known as on demand repo) is a repurchase agreement that is agreed without fixing the maturity date. Instead, either party can terminate the repo on any day in the future, provided they give notice before an agreed daily deadline.

Until an open repo is terminated, it automatically rolls over each day. Interest accrues daily but is not compounded (i.e. interest is not earned each day on interest accrued over previous days). Where parties have open repos outstanding between themselves all the time, accumulated interest is typically paid off every month. The initial repo rate on an open transaction will be close to the overnight repo rate, but it will not subsequently change until the parties agree to reset the rate.

Open repo is used to invest cash or finance assets where the parties are not sure how long they will need to do so.

Figure 43: Concentration analysis



Source: The ICMA's semi-annual survey of the European repo market in December 2015.

Then looking at how repo transactions are executed and processed post-trade, different scenarios can be distinguished. Below table contains a list of the 7 main repo (post-) trade scenarios, including the estimated market shares of each of these.

Table N: Repo (post-) trade scenarios and estimated market shares

Name	Trading	CCP	Triparty	Users	Share
1: OTC	direct/ voice	✗	✗	FI+NBF+OFI+NFC	47.7 %
2: OTC post-trade CCP	direct/ voice	✓	✗	FI	7.9 %
3: bilateral electronic	ATS	✗	✗	FI	9.8%
4: anonymous electronic	ATS	✓	✗	FI	22.0%
5: traditional tri- party	Direct	✗	✓	FI+NBF+OFI+NFC	10.9 %
6: SIX tri-party	ATS	✗	✓	FI	0.1 %
7: GC pooling	ATS	✓	✓	FI+NBF	1.6 %

Source: Based on latest [ICMA European Repo Market Survey](#) (December 2015 data).

Note: The survey is based on stock data. This tends to significantly understate the share of electronic trading and CCP-clearing, as compared to other accounts based on flow data such the [ECB's money market survey](#).

6.1.6.4. What is a haircut¹⁵³

A haircut is the difference between the market value of an asset and the purchase price paid at the start of a repo. An initial margin is an alternative to a haircut. A haircut is expressed as the percentage deduction from the market value of collateral (e.g. 2%), while an initial margin is the market value of collateral expressed as a percentage of the purchase price (e.g. 105%) or as a simple ratio (e.g. 105:100).

Ideally, collateral should be free of credit and liquidity risks. The market value of such perfect collateral would be certain, meaning that it would be easy to sell for a predictable value in the event of default by the collateral-giver. The type of asset that comes closest to this paradigm, and is in fact the most commonly used type of collateral in the repo market, is a bond issued by a creditworthy central government.

The haircut or initial margin represents the potential loss of value due to (1) price volatility between regular margining dates (in case there is a default between a calculation of a margin call

¹⁵³ ICMA frequently asked questions on repo – December 2015.

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and the payment or transfer of margin in response to that margin call) and (2) the probable cost of liquidating collateral following an event of default, as well as (3) inconsistencies between the valuation methodologies used in margining and for a default. There are three broad issues: delays in liquidation, price volatility and the potential price impact of a default by the issuer of the collateral asset. Time delays include: how long it takes to respond to a margin call (operational risk); the likelihood of a delay in liquidation due to a legal challenge to the non-defaulting party's title to the collateral asset or his right to net (legal risk); and how quickly the entire holding of a collateral asset could be liquidated without a significant market impact or how far might the price fall or be forced down by faster selling (liquidity risk). If the cash and collateral are denominated in different currencies, price volatility must include the effect of exchange rate fluctuations. It is arguable as to whether the credit risk of the repo counterparty should affect the size of a haircut or initial margin, given that the risk of loss by a non-defaulting party is a function of the collateral and collateral management rather than the credit of the counterparty (i.e. a matter of loss-given-default rather than probability of default). However, it is appropriate to take account of any significant correlation between the credit risks of the repo counterparty and the issuer of the collateral (so-called 'wrong-way risk'), as this will diminish the effectiveness of the collateral. Nevertheless, in practice, many parties do factor in the credit risk of their repo counterparties.

6.1.6.5. Typical post-trade processes supporting repo

Clearing: CCPs clear a very significant proportion of the European repo market. The ICMA's semi-annual survey of the European repo market suggests that about 30% of outstanding repos by value are cleared across a CCP. The proportion of repo turnover cleared across a CCP is likely to be even higher because the repos cleared in CCP tend to be short-term transactions (the ECB's money market survey suggests in the order of 70%). Most CCP cleared repos are negotiated on automatic repo trading systems such as BrokerTec, Eurex Repo and MTS. However, repo negotiated directly between parties or via a voice-broker can also be registered with a CCP post-trade. The principal CCPs clearing repos in Europe are:

- LCH Clearnet Ltd in the UK, LCH-Clearnet SA in France,
- Eurex Clearing in Germany,
- CC&G in Italy,
- And BME Clearing in Spain.

The clearing of repo transactions is effected by using the same processes as described in section 3.3 on Clearing.

Trade processing: The matching and settlement of repo related transactions (initial sale of the securities and repurchase of fungible securities at a future date) are effected by using the same processes as described in sections 3.4. and 3.5. of this Annex 3. An illustration of a typical repo lifecycle is also provided in Figures 44 and 45 below.

Asset servicing: The servicing of the securities that are used in repo transactions is effected using the same process as described in section 3.6. of this Annex 3, with the following caveat.

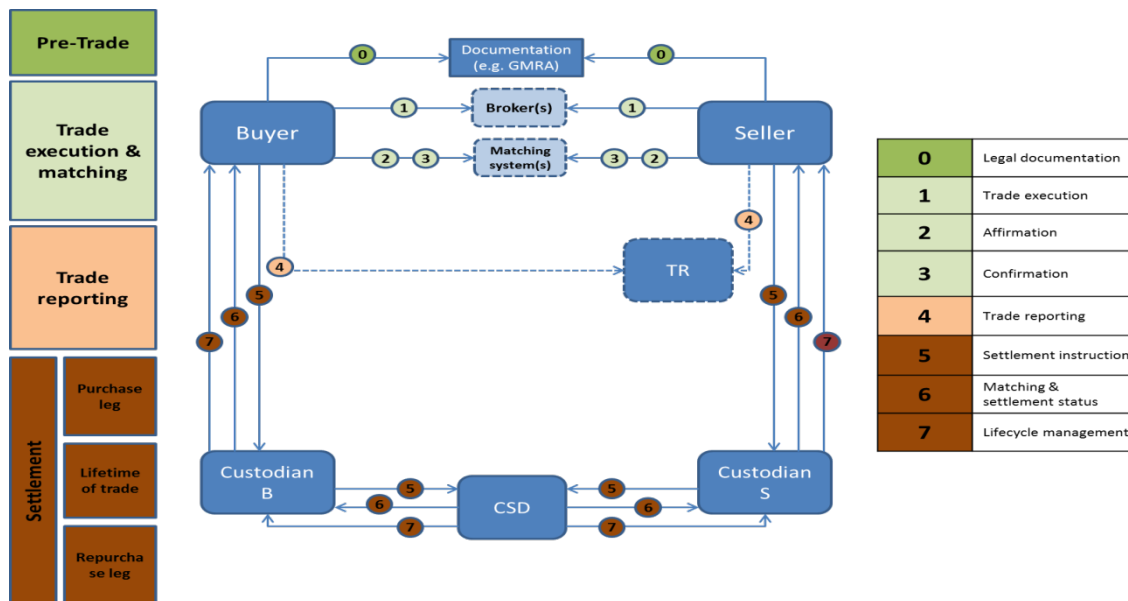
During the life of a repo, the buyer holds legal title to the collateral. In other words, the collateral is his property and he is entitled to any benefits of ownership. This means he should receive any coupon, dividend or other income that may be paid by the issuer of the collateral. However, the seller of collateral retains the risk on the collateral, as he has committed to buy it back at a fixed price in the future (so, if the price falls between selling and buying, the seller will suffer the loss and vice versa). The seller would not accept the risk on the collateral unless he also received the return, including coupons, dividends or other income. To satisfy the seller, under the GMRA, the buyer agrees to pay him compensatory amounts equivalent to any income payment received on the collateral. These are *manufactured payments*.

Similarly, if there is a corporate action event on the security subject to a repo and if such corporate action requires the investor to make a choice, the buyer holds legal title to the collateral and will make such a choice. However usually, such a choice will be made in close consultation with the seller who has committed to buy back the securities in the future.

Tax services: The taxability of repo returns depends on local fiscal regulations applicable to the parties in a repo transaction. Similarly whether or not manufactured payments, as described here above, would be subject to the same fiscal and withholding rules as those applicable to the income on the securities subject to the repo transaction, will depend on the local fiscal regulations applicable to the parties of the repo transaction.

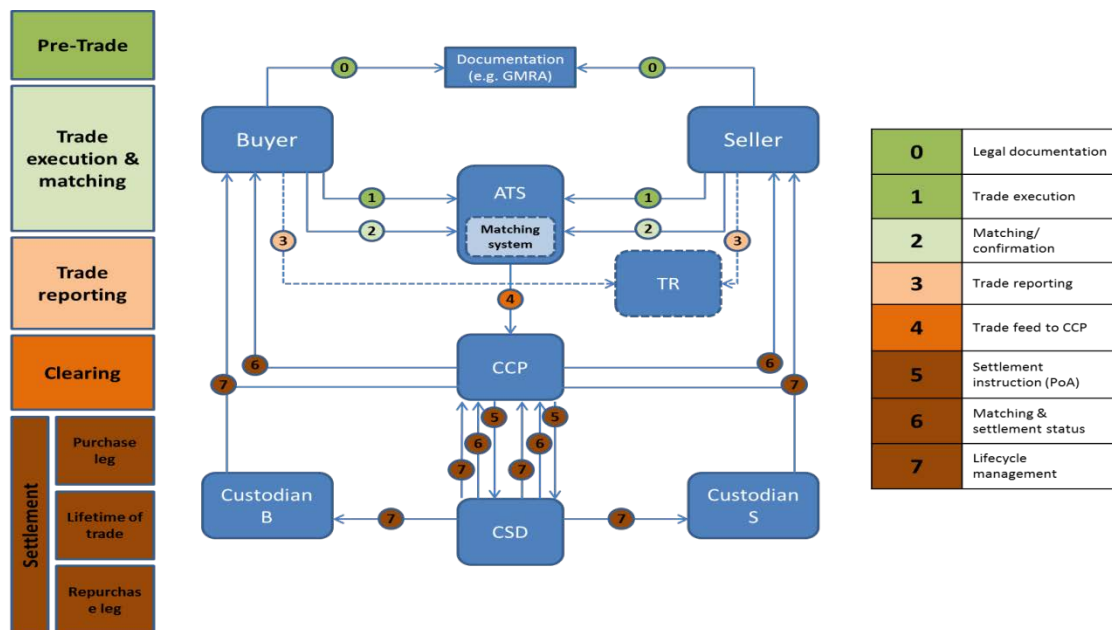
Types of repo post-trade processing

Figure 44: OTC scenario (direct/voice, no CCP)



Source: ICMA, Cogesi Workstream 3 papers.

Figure 45: Repo post-trade processing: Anonymous-electronic scenario (ATS, CCP)



Source: ICMA, Cogesi Workstream 3 papers.

6.1.6.6. Repo documentation: GMRA

The purpose of collateralisation is to secure a lender (i.e. mitigate his credit risk) by giving him the right to liquidate collateral provided by the borrower in the event that the borrower becomes insolvent or defaults in another way. In repo, security is established by transfer of legal title to the collateral. In order to ensure that courts will enforce a lender’s right to collateral, it is usually mandatory (in the case of pledges) or prudent (in the case of title transfer) to provide a written

agreement as evidence of the intentions of the parties to give the lender the right to liquidate the collateral.

In the case of repo, the evidence provided by a written agreement should help to ensure that a court would not invalidate the transfer of title to the collateral and re-characterise the repo as a secured loan. In many jurisdictions, such re-characterisation would deprive the holder of any rights to the collateral, as the parties would not have originally intended to make a pledge nor would they have performed any of the formalities normally required to establish a pledge. The lender would therefore find himself an unsecured creditor.

GMRA is a model legal Agreement designed for parties transacting repos and is published by the *International Capital Market Association (ICMA)*, which is the body representing the bond and repo markets in Europe. The GMRA is the principal master agreement for cross-border repos globally, as well as for many domestic repo markets. Beyond the GMRA master agreements, market participants use also national master agreements (e.g. German master agreements for Repo transactions).

6.1.6.7. Existing market practices in relation to repos

- Guide to Best Practice in the European Repo Market:
<http://www.icmagroup.org/Regulatory-Policy-and-Market-Practice/short-term-markets/Repo-Markets/repo0/>
- Information on GMRA:
<http://www.icmagroup.org/Regulatory-Policy-and-Market-Practice/short-term-markets/Repo-Markets/global-master-repurchase-agreement-gmra/>

6.1.7. Securities lending and borrowing

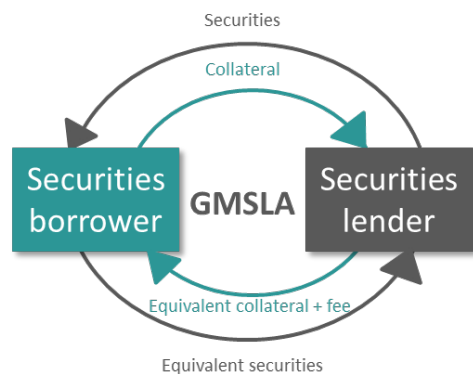
Securities lending transactions (along with repos) are a type of securities financing transaction (SFT). In a securities lending transaction:

- One party (the Lender) transfers title to a security or basket of securities on a temporary basis to another party (the Borrower) in exchange for either (1) title to another security or basket of securities (non-cash collateral) or (2) cash (as collateral), and the payment of a fee.
- And has a contractual obligation to either (1) return title to equivalent collateral or (2) repay cash plus an agreed return at a future date or on demand, in exchange for title to a security or basket of securities equivalent to the one it transferred at the start.
- Despite securities lending counterparties being called Lenders and Borrowers, title to securities is generally legally transferred (at least outside the US) in the form of a title transfer.

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6. Collateral management

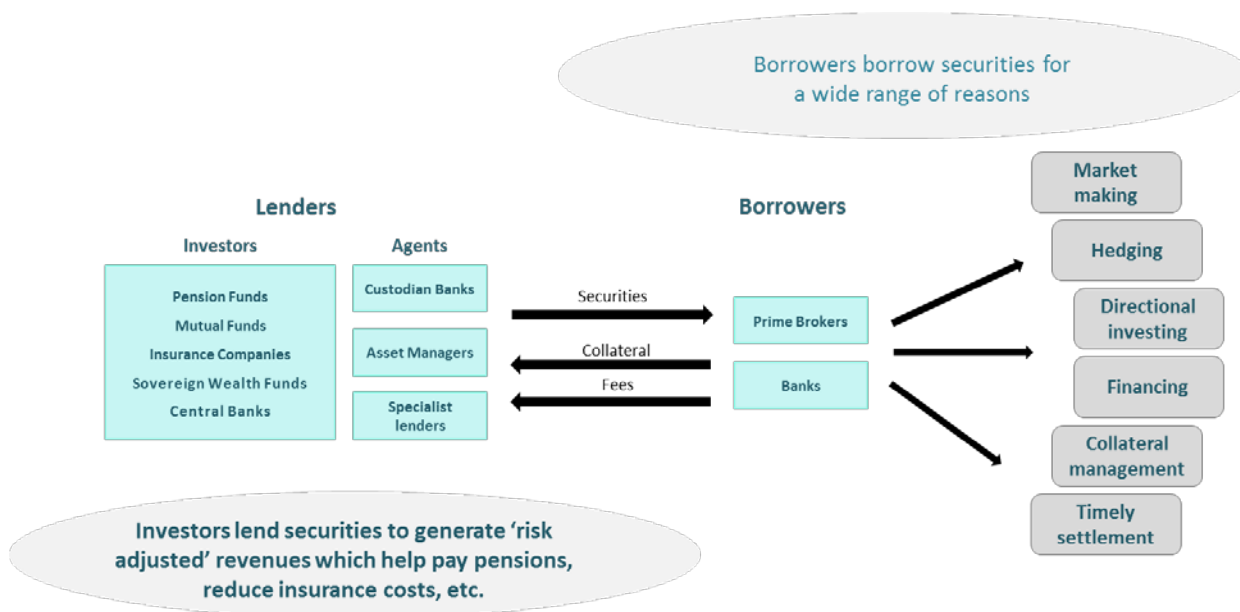
Figure 46: What is securities lending?



Source: ICMA/ ISLA.

Securities lending transactions and repos are analogous transactions in legal and economic terms. The main differences are that: securities lending does not necessarily involve cash (it can be security against security); is generally driven by the demand to borrow specific securities (rather than cash); and tends to be transacted on an open basis. The standard master agreement for securities lending is the ISLA Global Master Securities Lending Agreement (GMSLA). Beyond the GMRA master agreements, market participants use also national master agreements (e.g. German master agreements for Securities lending transactions).

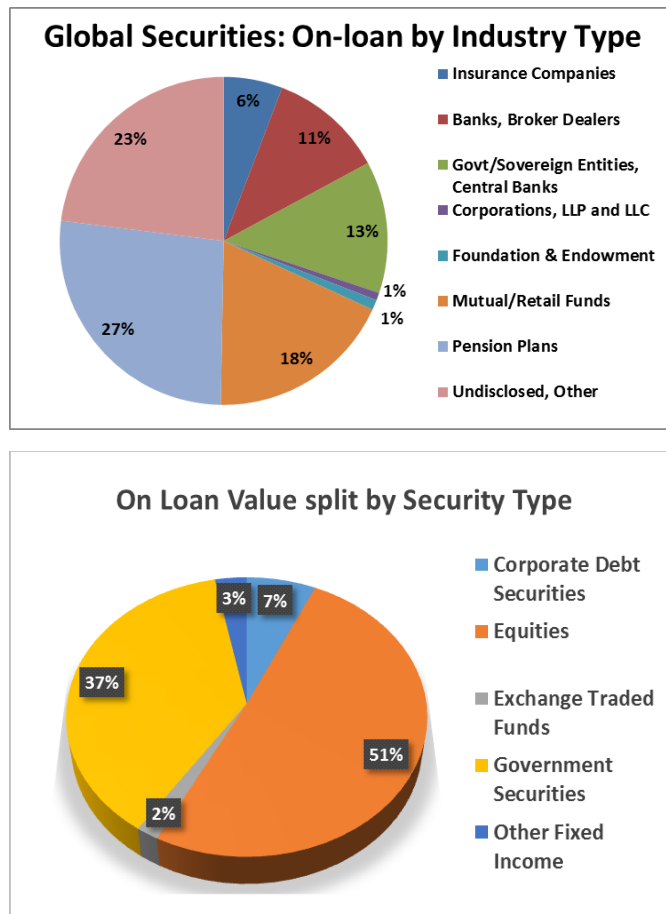
Figure 47: Who uses securities lending and why?



Source: ISLA.

Investors make assets available for securities lending, although only a proportion of this is lent at any one time. It is estimated that €12 trillion assets are made available in the global market for securities lending of which approximately €1.8 trillion is lent at any one time across all asset types. Analysis shows that approximately 37% of this is Government bond assets with the other 63% made up of other fixed income assets and equity based instruments. Analysis estimates around a third of all activity is derived from European entities and/or transacted in European markets.

Figure 48: Securities on loan by lender type and asset type



Source: ISLA¹⁵⁴.

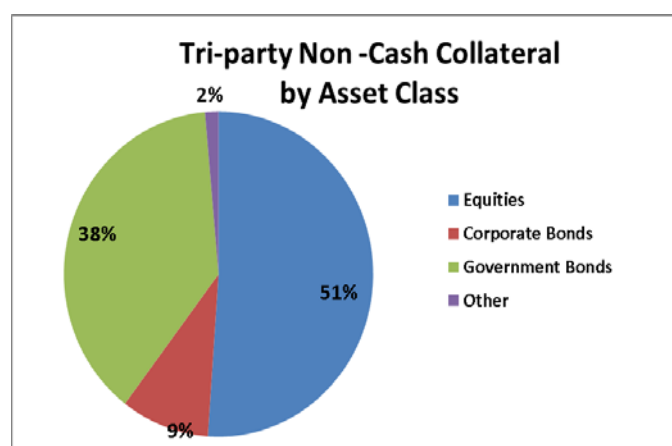
It is estimated that over 60% of securities lending transactions are collateralised with non-cash collateral and that over 90% of this is held and managed by tri-party collateral managers, and over 50% is equity securities.

¹⁵⁴ ISLA sources data from the following data providers: Markit, FIS, Datalend, BNYM, JP Morgan, Clearstream, Euroclear.

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Figure 49: Non-cash collateral managed by triparty collateral service providers for securities lending by asset class



Source: ISLA.

Existing market practices in relation to securities lending:

- Securities Lending Guides and agreements:
<http://www.isla.co.uk/standard-documentation/#securities-lending-guides>

6.1.8. Margining of OTC derivatives

While this chapter covers OTC and ETD derivatives from a collateralisation point of view, a wider description of the OTC/ETD derivatives market can be found elsewhere in the document (chapter 5).

As explained in section 5.3, collateralization has been a feature of the OTC derivatives business since its inception, as a way to enhance the counterparty quality (in terms of credit standing) and thus enlarge the potential set of market participants who would otherwise not have been able to trade.

Credit quality is much more important to an OTC derivatives transaction than to a traditional 'cash' securities transaction because of their long-term nature (typically, an OTC derivatives transaction can have maturities ranging from 5 to 10 years, but they can be as long as 50 years or more).

OTC derivatives collateralization is handled through an annex - the CSA (Credit Support Annex) - to the ISDA Master Agreement, which governs the collateralization.

Alternatively, market participants use also national master agreements (e.g. German Master Agreement for Financial Derivatives Transactions).

Typically, such agreements call for an "Initial Amount" - which is tantamount to Initial Margin (IM)¹⁵⁵ - which was due either at the inception of the trade or after a threshold amount was exceeded¹⁵⁶. Under traditional ISDA Master Agreements, collateral was exchanged to reflect mark-

¹⁵⁵ Generically speaking, the term Initial Margin refers to the amount of collateral provided by a party to a derivatives transaction to the counterparty, in order to cover potential losses in the event the party defaults, and until the counterparty establishes a replacement for the defaulted transaction. In the absence of regulation, the initial Margin is set by common agreement between the two parties involved. Please also see the ECB Glossary on margins in next footnote.

¹⁵⁶ See also the definitions in the ECB Glossary on margins: Margin call: A procedure related to the application of variation margins, implying that if the value, as regularly measured, of the underlying assets falls below a

to-market movements (i.e., variation margin) whereas independent amounts (approximately equivalent to initial margin, without requiring the sophistication of modelling done by CCPs) were more unusual. With the advent of new regulation calling for the margin of non-cleared OTC derivatives transactions, the ISDA CSA is being updated to deal with VM payments in a more sophisticated manner. ISDA has done (and continues to do) a lot of work in this area to standardize, to the extent possible, the terms and associated processes, including a dispute resolution framework, used to address disputes arising from differences in collateral calculation, as stipulated by EMIR.

Clearing, by its very nature requires complete collateralization in the form of IM, as well as daily VM. Given that at least 70% of the OTC derivatives business is likely to (if not already) be cleared, demand for collateral is expected to increase substantially with some estimates as high as \$1 trillion or more. In addition to the substantial increase, the mandatory shift to clearing required by G20 reform is creating several waves of additional processing requirements (be they, in the form of putting in place clearing agreements, sourcing and managing the required collateral, etc.), despite the fact that the collateral management process takes place at the CCP.

However, much more challenging from a processing point of view is the G-20 commitment to margin (virtually) all OTC derivatives that are not cleared, by requiring that the two parties involved in a OTC derivatives transaction to post IM (two-way IM process) to each other, as well as to regularly (daily) exchange VM.

Given the fact that in the OTC derivatives market, collateralization was an optional feature with far from universal use (particularly the VM option), the new margin requirement has led to a huge increase of new requirements ranging from:

- Incremental demand for collateral, estimated to be in excess of \$1 trillion (see section 6.4.1. below on potential collateral shortage discussion)
- Need for new processing facilities to calculate collateral on a uniform basis (need for a standard IM model) so that the two contracting parties come up with the same collateral valuation
- Need to put in place an efficient dispute resolution regime to address any disputes in a highly efficient and timely manner
- Need for new CSAs to legally address the new requirements
- Need for new collateral processing facilities to deal with the large number of collateral calls and associated timely moves that the new collateral requirements will generate
- Need to revise legal documentation to address certification needs
- Demand on existing infrastructures (custodians, collateral providers, collateral transformation and optimization services) to efficiently mobilize the required collateral, in particular securities.

certain level, the central bank requires counterparties to supply additional assets (or cash). Similarly, if the value of the underlying assets, following their revaluation, were to exceed the amount owed by the counterparties plus the variation margin, the counterparty may ask the central bank to return the excess assets (or cash) to the counterparty.

Variation margin: Profits and losses calculated on a daily basis in open futures contracts and options, resulting in the counterparty to the bilateral trade making a payment to the relevant clearing house or vice versa.

Initial margin: For instruments cleared by a central counterparty (CCP), the amount of collateral that each participant is required to provide to the CCP (or the clearing member), in order to cover potential losses in the event of that participant defaulting. The initial margin is calculated on the basis of a formula set by the CCP.

6.2. Market structure

6.2.1. Market actors

There are a vast number of types of collateral givers and takers, depending on the nature of the trading relationship and the nature of the exposure to be covered. While it is impossible to provide an exhaustive list, some key actors are:

6.2.1.1. Financial institutions

- Banks and broker-dealers, which either act on their own behalf (e.g. dealers, repo and swap desks, lending desks) or on behalf of underlying clients (e.g. executing brokers, prime brokers, clearing agents, agent lenders), and take/provide collateral to secure a variety of exposures with counterparties as a result of trading or other activities.

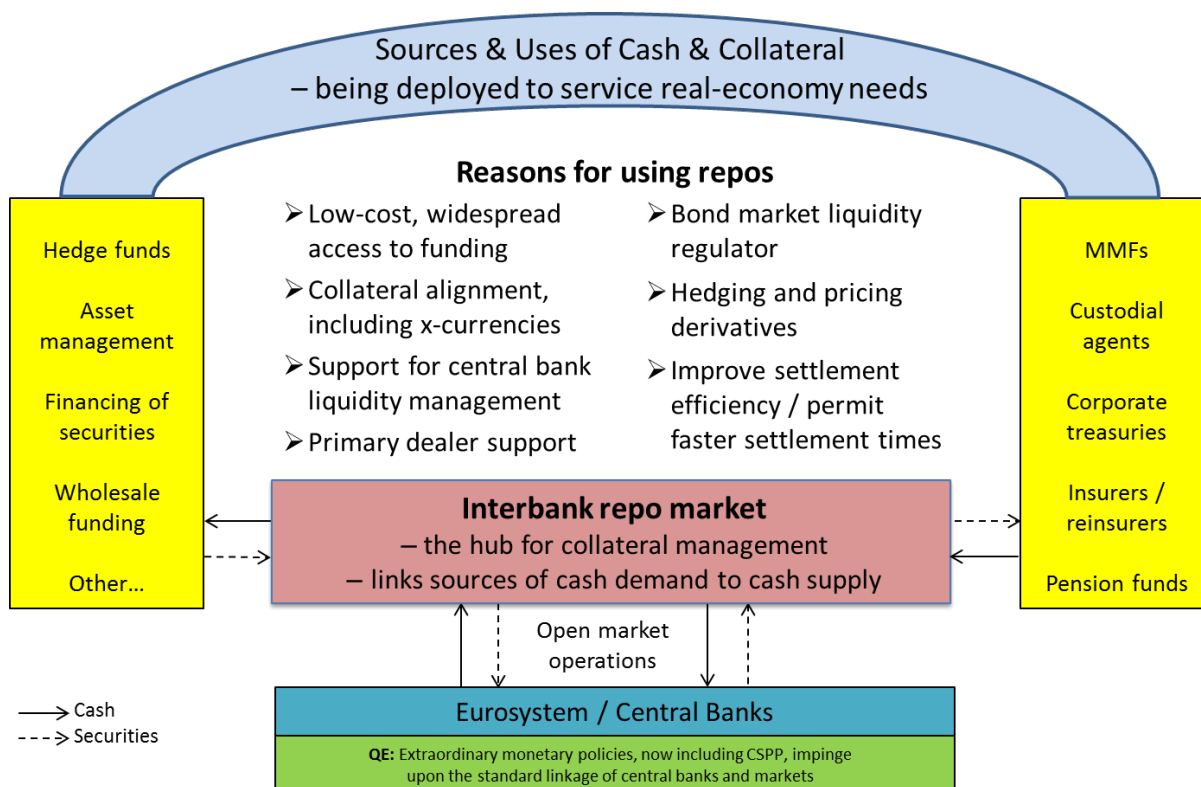
This also includes instances where clearing agents and custodians require collateral to support the clearing and settlement activity of their clients.

- Non-bank financial institutions, such as asset managers, pension and hedge fund managers.

6.2.1.2. Non-financial institutions:

Examples are corporates, who use collateral as part of their hedging (e.g. FX) or funding (e.g. treasury desks) activities.

Figure 50: Use of repos in the real economy



Source: ICMA.

6.2.1.3. Central banks

Central banks generally provide credit only against adequate collateral. Most central banks thereby rely on the repo market as the main channel for the transmission of monetary policy

implementation to the wider financial market and to provide emergency assistance to the banking system.

In relation to securities settlement, the cash leg of transactions is often settled in central bank money, whereby the central bank usually provides intraday liquidity based on the provision of adequate collateral. In T2S, this is done via a system of (Central Bank) auto collateralisation. In addition, T2S also provide facilities to allow market parties to collateralize their settlement (and other) activities between themselves, e.g. via client auto collateralisation.

Since 2008, many central banks have revised and reviewed their collateral management practices, with a view to make them more robust and resilient. This has resulted in a strengthening of processes and more stringent criteria¹⁵⁷.

6.2.1.4. CCPs

Central Counterparties (CCPs) centralize the management of individual counterparty risk, by mutualising and distributing these risks to their participants. In this function, CCPs require collateral to guard against losses in the event of counterparty defaults. They are asked to cover both current counterparty exposures (variation margins) and potential future exposures that could arise from valuation changes (initial margins and default fund contributions).

As mentioned above, the expansion of central clearing (especially for OTC derivatives) is increasing the importance of CCPs being extremely robust, and hence the importance (and amount) of collateral lodged with CCPs.

In addition, interoperability between CCPs is also applying specific requirements and constraints, and requires CCPs to provide collateral to each other.

As part of their treasury and settlement activity, CCPs also require funds to settle pending transactions, for which they also have to post collateral (usually with central banks) to obtain liquidity. Finally, CCPs also invest their own funds on a collateralised basis, generally through repo¹⁵⁸.

6.2.1.5. Central Securities Depositories (CSDs)

CSDs can be involved in the management of collateral in a variety of ways:

- a) As settlement and custody platforms, transferring collateral between parties
- b) As credit institutions: While the main function of CSDs are the notary and settlement functions, CSDs may also require collateral when and if they provide commercial banking services. This is notably the case for the two International CSDs (Euroclear and Clearstream), who act as liquidity providers for activity on their books. The (draft) EBA requirements on CSDs providing banking services is likely to limit the type of assets which can be pledged as eligible collateral to (I)CSDs in this perspective

¹⁵⁷ See: Central bank collateral frameworks and practices. BIS March 2013

¹⁵⁸ See:

- ESMA 2016 Report on Trends, Risks, and Vulnerabilities
https://www.esma.europa.eu/sites/default/files/library/2016-48_report_on_trends_risks_and_vulnerabilities_1-2016.pdf
- BIS working papers 373: Collateral requirements for mandatory central clearing of over-the-counter derivatives.

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- c) (I)CSDs may also provide a Securities Lending and Borrowing service by which they support the settlement efficiency of the market. (I)CSDs enable liquidity providers (lenders) to reduce settlement failure of the borrowers against collateral. The exposure created by this is usually covered by collateral
- d) As providers of collateral management services, e.g. triparty collateral agents (see further below)

(I)CSDs may also have to provide collateral in order to obtain liquidity from central banks and other liquidity providers. Especially in a cross border context, this can become quite complex and be an area of focus.

6.2.1.6. Other providers of services related to collateral management

- Trade execution platforms: this includes bond trading and financing platforms, swap and other derivatives platforms. While they typically do not act as collateral givers or takers, they create exposures, which require need for collateral.
- Other providers, such as trade compression and reconciliation services, data repositories and information warehouses.

6.2.1.7. Collateral management service providers (e.g. triparty agents) and service models

The majority of financial institutions act both as collateral takers and collateral providers in the frame of their different trading and treasury activity. In addition, a number of market infrastructures (i.e. ICSDs and CSDs) also provide collateral services to support operational aspect of collateralization between market participants.

Where there are a number of providers who offer these services in the bilateral derivatives space, only a few service providers offer a full 'triparty' collateral management activity across derivatives, securities financing, CCP margining and central bank activity. These are the 2 ICSDs, and 2 major banks (JP Morgan and Bank of New York). As part of their expanding role post-T2S and CSDR, a number of CSDs are also enhancing their collateral management services.

Two major collateral management models can be identified¹⁵⁹.

The bilateral collateral management

Bilateral collateral management is based on the concept of managing in-house the complete life cycle of the collateral management activity against counterparties, based on collateral management applications developed internally or acquired from a specialised software vendor. There are also certain financial institutions, which utilize the collateral management applications, offered as Software as a Service (SaaS) from a handful of niche software providers.

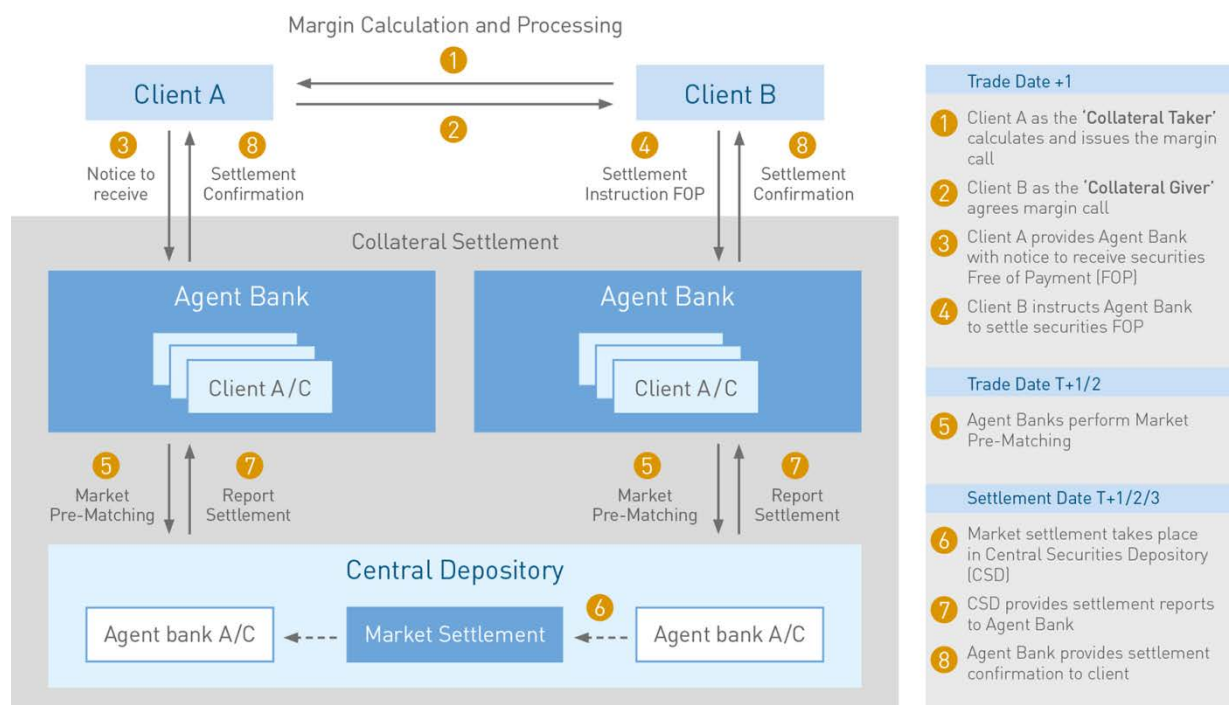
Under this model, clients are required to capture the necessary data and trade feeds, calculate and issue their margin requirements against each other in line with the governing legal documentation, signed on bilateral basis (usually via a Credit Support Annex, GMSLA and others).

Focusing on the collateral mobility aspect of the bilateral collateral management based on the Custody Agent model, the parties will need to exhibit a high level of involvement in selecting and mobilising the collateral required between different locations. Following each margin agreement,

¹⁵⁹ Description and graphs taken from the ISSA report: Collateral Management – Cross Border Mobilisation of Collateral (07/2016)

both parties to the transaction are required to instruct their Agent Bank to mobilise the collateral (i.e. securities settlement for FoP) or their cash correspondent bank for cash settlement, delivery on T+1.

Figure 51: Margin processing flow



Source: ISSA.

The triparty collateral management model (as described in the ISSA report)¹⁶⁰

Triparty collateral management is best described as an outsourced collateral management activity by the parties of the transaction to a third-party acting as neutral agent. Traditional triparty collateral management services have been in existence for the last 30 years or so and are designed to simplify the administration of various transactions under different legal agreements for both counterparties to the transaction: the Collateral Givers (CGs¹⁶¹) and Collateral Receivers (CRs¹⁶²). The key users of triparty collateral management services are central banks, CCPs, investment and commercial banks, highly regulated investment funds (UCITS/AIFs), various securities lenders and corporate cash providers. A triparty agent offers different levels of services tailored to the underlying business requirements of each business area, as well as a bilateral agent. Triparty structures have long been used for repo and securities lending in global markets and currently services are leveraged to meet the requirements of the non-cleared derivatives margining activity.

¹⁶⁰ ISSA report: Collateral Management – Cross Border Mobilisation of Collateral (07/2016)

¹⁶¹ Collateral Giver: The party to a transaction that provides collateral securities and/or cash to the Collateral Receiver in exchange for securities and/or cash. CGs can be Broker Dealers, Commercial Banks etc. CGs are responsible for providing the required level of eligible collateral to meet their exposure coverage requirements.

¹⁶² Collateral Receiver: The party to a transaction that lends securities and/or cash to the Collateral Giver in exchange for an amount of securities and/or cash that is held and monitored on the collateral account. In addition to the general CGs' participant profile, Central banks, Supranationals, State agencies, CCPs are also participants of the triparty collateral management activity.

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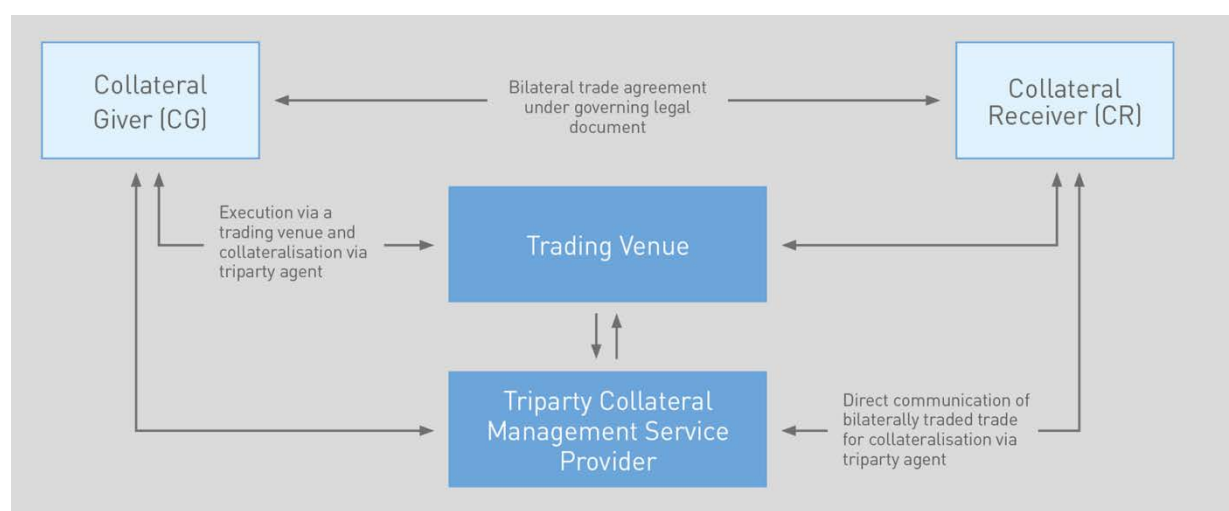
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The objective of a triparty agent is primarily to mitigate operational risk associated with such transactions by offering high degrees of automation, settlement, margining, safekeeping and monitoring services and to provide tools to efficiently manage the collateral across different underlying business lines.

The triparty collateral agent fulfils a facilitating role:

- Undertaking administrative functions, thus reducing cost and workload for customers,
- Providing a fully documented and neutral service,
- Ensuring reduced risk through independent agency services,
- Providing a secure environment for the settlement, valuation and safekeeping of the assets.
- Providing a clear cost structure for management of collateral

Figure 52: Role of triparty agent



Source: ISSA.

Triparty collateral management service is an outsourced activity providing end-to-end collateral servicing to the extent defined by the customer, automatic allocation and substitution of the securities according to the predefined eligibility profiles vs manual selection, and mobilization of the selected collateral (as defined by the customer).

6.2.2. Competition: current state and issues

In view of the importance of collateral for financial markets, there needs to be sufficient open competition and a level playing field between providers of collateral services.

The new pieces of regulation that mandate, or encourage, the use of collateral as a tool of counterparty risk management have a significant impact on all financial market participants, either directly (if the rules apply directly to them) or indirectly (if the rules apply to their counterparty).

In consequence, all participants in financial markets may have the need for collateral management services, and may be faced with issues in accessing services. As not all market participants can access core infrastructure, many market participants need the ability to access collateral management services provided by intermediaries.

More analysis is needed with respect to restrictions on the access to, and on the provision of, collateral management services. In addition, there is a need for further analysis of the market and

competitive implications of collateral services that are embedded in the core settlement service of financial market infrastructure. On the one hand there are concerns about concentration risks, in particular in relation to CCPs. The shift to central clearing under EMIR has created significant risk management challenges for market participants, and concentrated risk in a few major CCPs. While this is a wider topic, in the area of collateral management, the collateral acceptance criteria of CCP's could have systemic impacts, especially in case of sudden changes due to market stress. It is also worth noting that CCPs are increasingly becoming major users in SFT and cash markets, with large cash balances to invest in the market and the potential need to rapidly liquidate securities collateral in case of default.

It could be analysed whether similar challenges would apply to CSDs and collateral service and pricing service providers in the framework of collateral management and liquidity provision services.

On the other hand, related to the lack of open access and the persistence of national barriers to cross-border securities markets, there are concerns around the continued fragmentation of post-trade infrastructures in Europe. The number of post-trade infrastructures (CCPs and CSDs), together with their diverse and non-harmonized criteria (e.g. message formats) and processes (e.g. collateral cut-offs) around collateral, different types of links¹⁶³ and lack of full seamless (settlement) interoperability, is creating a number of issues and concerns, especially around collateral mobility (see section 7.4.1).

6.3. Market practices

Traditionally, processes and services around collateral management were managed in a non-automated and decentralised manner. Increasingly, processes have been developed to improve the management of collateral. In particular, important work in this regard has been undertaken over the past years in the context of the ECB's Contact Group for Euro Securities Infrastructures (COGESI)¹⁶⁴.

The Group has recently initiated further work on the harmonisation of collateral management. Three separate work streams have been established, focusing on: (i) collateral mobility, (ii) collateral holding and segregation (including information on what collateral obligations exist and what securities may be available to fulfil those obligations), (iii) collateral messaging and reporting.

While this work is still at an early stage it is highly relevant and complementary to the work undertaken by the EPTF. Both initiatives need to be closely aligned. Extensive market best practices have also been developed over the past years in relation to securities financing transactions.

6.3.1. Collateral mobility

(From COGESI draft list of key harmonisation activities for collateral management arrangements – as of June 2016).

6.3.1.1. Objective (“What”)

Collateral should be able to move quickly and efficiently across borders via tri-party and bilateral collateral management processes, i.e. to be able to mobilise collateral on demand to where it is

¹⁶³ See the recent ECSDA study on “overview of CSD links in Europe”
http://ecsda.eu/wp-content/uploads/2016_07_29_CSD_Links_Overview.pdf

¹⁶⁴ <https://www.ecb.europa.eu/paym/groups/cogesi/html/index.en.html>

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needed and to meet regulatory requirements. A greater level of automation and connectivity between market infrastructures (i.e. CCPs, (I)CSDs/collateral agents) should be established to ensure timely delivery of collateral across borders.

6.3.1.2. Issues (“Why”)

The lack of collateral mobility is often cited as an industry constraint¹⁶⁵. Further analysis is needed on (national) restrictions that impede movement of collateral (and related services). As a starting point, the following four main issues could be taken into account

The prompt access to collateral from different asset inventories in standardised manners is needed for assets, which are managed via bilateral collateral management processes. For example, buy-side depositaries need to provide access to the asset inventory and the buy-side depositaries need to enable external collateral managers to instruct on collateral movements. Currently, asset managers could be using more than 20 different depositaries and process flows and IT-implementations are not synchronized across all of these depositaries

The implementation of the newly created variation margin collection for uncleared OTC derivatives on T+0 within such a short timeframe is a challenging requirement for the buy side. The implementation of such requirement is for the buy side a complex task as various market participants in the collateral fund chain (e.g. custodian, external collateral manager, (external) portfolio manager, counterparties, valuation service provider) need to interact within strict time frames set by cut-offs and in different time zones, in order to reconcile and to agree on the variation amount before either a collection of a cash amount or a collection of non-cash collateral financial instrument is triggered.

From an operational perspective, the custodian of the investment fund is usually responsible for either a payment or posting of non-cash collateral security if a variation margin event is triggered.

The operational process is further complicated if the various market participants are located in different time zones (e.g. UK/US-counterparties) thereby extending the timeframes for the management companies to agree on the variation margin amounts which go clearly beyond the newly created timelines.

There is typically a chain of intermediaries between the fund custodian, sub custodians and CSDs.

Every party within that chain refers to its own cut-off times, which take into account the cut-off times of the next party within the chain. Cut-off-times are different for the diverse kind of securities and margin calls might reach the UCITS/AIF and their outsourced fund managers after the relevant cut-off times.

On top of that, neither the fund management company nor the outsourced asset manager can influence the timing of margin calls. For that reason it is out of the control of the market participant whether or not it can comply with margin calls in time only relying on free of payment title transfers, by the fund and the counterparty.

- Cross-border transactions are subject in non-T2S markets to different settlement cut-off times (and there may be differences in collateral cut-offs), which may also result in collateral settlement fails¹⁶⁶. Limited operating timeframes hamper same-day trading and

¹⁶⁵ In COGESI and see also for example:

<https://www.euroclear.com/dam/Brochures/Euroclear-Collateral-Management-Aite-Paper.pdf>

¹⁶⁶ See for example “Implications of Collateral Settlement Fails: An Industry Perspective on Bilateral OTC Derivatives.” <http://globalcollateral-publications.businesscatalyst.com/>

settlement in the European repo market when involving different non-T2S cross-border and cross-system arrangements or settlement between T2S in-CSDs as CSDs outside of T2S.

- Interoperability is not available for CCP cleared SFTs/triparty repo products, which results in collateral being blocked in certain infrastructures (silos). Differences in triparty market models also result in different procedures for providing collateral to the Eurosystem via triparty arrangements.
- Lack of interoperability between collateral management service providers also results in securities being blocked with a provider. The most efficient way to move collateral is by performing book-entry transfers on the book of the provider who has the assets in custody. This can be done at any point in time without limitation. Moving asset from one provider to another is much less straightforward and can only be effected during opening hours of the infrastructure where the assets are located.
- Other national-specific obligations for service providers might also be an impediment to collateral movements.

The analysis could focus on requirements for greater integration of post-trade infrastructures, involving automated trading, clearing, triparty collateral management services and settlement at (I)CSD level. In general, this activity supports access to collateral and compliance with new regulatory requirements.

6.3.1.3. Work is currently on going in COGESI in the following harmonisation topics:

- (i) Prompt access to collateral
- (ii) Cross-border connections (e.g. ICSD Bridge improvements)
- (iii) Interoperable triparty collateral management processes (tri-party interoperability)
- (iv) Improved collateral management practices

In March 2014 ISSA issued a report¹⁶⁷ on “best practices of collateral management for cleared and bi-laterally traded products which includes some ISSA proposed measures:

- Chapter 4 provides a summary of those issues that a firm might consider for creating best practices both in terms of preparation before and immediately following a default by a third party.
- Chapter 5 reviews issues and best practices associated with customer communication, reporting and position reconciliation. In addition it focuses on reporting to third party service providers as well as to regulators.
- Chapter 6 discusses some observations relating to emerging trends primarily in response to the general regulatory reform including the mention of noteworthy industry initiatives.
- Chapter 7 gives a high level summary of provisions in primary legislation (including certain proposed legislation), which may have an impact on collateral takers and collateral givers in the EU.

In July 2016 ISSA issued a report¹⁶⁸ on cross border mobilisation of collateral:

- Chapter 2 examines the various industry models that exist and are emerging specifically to facilitate collateral mobility. The chapter provides flows for each of the models, and highlights the benefits and the potential risks (existing and new) that are present within the models. This chapter looks to remain agnostic as to which models are the best, and rather provides the reader with an understanding of each.

¹⁶⁷ http://www.issanet.org/pdf/2014-02_Final_Report_on_Collateral_Management.pdf

¹⁶⁸ http://www.issanet.org/pdf/Final_Report_on_Collateral_Management_July_2016.pdf

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- Chapter 3 provides views on the regulatory and industry initiatives and trends that are both aiding and hindering collateral mobility on a cross border basis. It also looks to provide suggestions for how market players could feasibly improve and remove existing obstacles.
- Chapter 4 rounds off the paper by providing a practical set of questions that any firm should take into consideration when assessing whether they should take advantage of the collateral mobility services available in the market. These questions are split into two sections: o An internal set of questions around exposure management requirements and strategy, which should help a financial player determine if cross border collateral solutions are appropriate for their needs. An externally focused set of questions which could form the basis of a due diligence questionnaire for a financial player, after deciding that it would make sense to look at cross border collateral options, to compare and contrast the different mobility models that are available, helping them to make the right choice for their particular needs.

6.3.2. Collateral holding, segregation and processing

(From COGESI draft list of key harmonisation activities for collateral management arrangements – to be updated as COGESI work evolves).

6.3.2.1. Objective (“What”)

Collateral holding and segregation structures should be established, which take into account best market practices in the custody chain (including advanced collateral management solutions, which offer a central/single intraday view on collateral inventories across borders and offer segregated collateral accounts) and contribute to legal compliance.

6.3.2.2. Issues (“Why”)

New regulatory requirements and market requests for segregation of counterparty collateral could lead to operational challenges to manage individually segregated accounts. COGESI members mentioned the following three main issues:

- Segregation requirements up the custody chain: Upcoming regulatory requirements have to be implemented for segregation for AIFM/UCITS and segregation of initial margin for non-cleared OTC derivatives, which could impact collateral management services¹⁶⁹.
- Transparency for market participants: Market participants are requesting to obtain incremental views on promptly updated asset inventories, so that they are able to react to changes in the market. They request effective collateral holding structures, which support a complete view of collateral to offer real-time reconciliation. Such structures should also facilitate the monitoring of what type of collateral is available for use for how long. And they should also support (intraday) collateral reconciliations from multiple data sets and sources.
- Transparency on the market: Transparency on the securities lending and structured collateral transaction markets could be improved (compared to the repo market).

6.3.2.3. Work is currently on-going in COGESI in the following harmonisation topics:

- (i) Segregation requirements up the custody chain: Best practices and processes should be established that contribute to legal compliance for segregation of counterparty collateral.
- (ii) Improved collateral management processes to obtain prompt information on inventories (i.e. avoid end-of-day collateral reconciliations) and provide central/single view on accounting/record keeping of collateral pledged to various counterparties.

¹⁶⁹ See the ESMA “consultation on asset segregation and custody services under AIFMD and UCITS”.

6.3.3. Collateral messaging and reporting

(From COGESI draft list of key harmonisation activities for collateral management arrangements – to be updated as COGESI work evolves).

6.3.3.1. Objective (“What”)

International messages should be used for collateral processes (such as mobilisation, margin, triparty, corporate actions and/or dispute /fails))) with harmonised data elements and unique identifiers. Reporting frameworks should be specified for repo, securities lending and structured collateral transactions (on how and when to report) and should be based on consistent data from multiple systems.

6.3.3.2. Issues (“Why”)

Harmonisation of messaging standards on a global basis should foster automation for collateral management. The following issues were mentioned:

- Communication on transactions: A lack of market standards/practices could cause disruption of the post-trade lifecycle transactions and hamper reporting. Without common standards, there is also the need to have multiple data sets and sources.
- Communication on margins: Common processes/standards for margining may need to be developed for less sophisticated players, such as the buy-side. The implementation of new standards is also expensive and adoption will only occur if harmonisation of messaging standards brings savings and efficiency benefits (and are adopted globally).

6.3.3.3. Work is currently on-going in COGESI in the following harmonisation topics:

In terms of measures, the relevant COGESI work-stream on collateral messaging is working on a mapping of the current collateral messaging ‘ecosystem’, as a basis to identify any gaps and inconsistencies and assess the need and priorities for further harmonisation. It is also considering the opportunities for using common (ISO 20022) standards for collateral messaging.

6.4. Future trends and impacts

6.4.1. Collateral shortage

Increasing demand for collateral assets in the aftermath of the financial crisis has raised concerns about a shortage of high-quality liquid assets (HQLA). Regulatory requirements for full collateralisation of risk, plus the shift of derivatives activity to a centrally cleared model are both expected to significantly increase the demand for collateral, especially cash and HQLA, which will have to be met.

Some reports (BIS 2013: Mind the gap?) indicate that concerns about a resulting collateral shortage seem unjustified, as the increase in the supply of HQLA appears sufficient to meet the additional demand arising from both market forces and regulatory changes. Such supply side changes could include the pooling and securitisation of assets, changes to collateral eligibility in private transactions, collateral optimisation, and collateral reuse and transformation.

However, these market responses could themselves generate risks for the financial system, such as increased interconnectedness, pro-cyclicality and higher operational, funding and rollover risks and might and thus warrant further monitoring (BIS 2013).

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Other studies highlight different elements. In particular, as pointed out also in other reports (ICMA 2014 – Collateral is the new Cash), demand-supply imbalances for collateral are unpredictable and likely to be cyclical. Key in addressing such imbalances is a sufficient level of collateral ‘fluidity’ to ensure that collateral can move to where it is needed, when it is needed, particularly under stressed conditions. Collateral fluidity requires bank funding desks that are able to source, price, manage and mobilise collateral (‘the pump’), but equally important are robust and efficient post-trade infrastructures (‘the plumbing’).

Another important factor to consider in this context is unconventional monetary policy. Ongoing central bank asset purchases as part of quantitative easing efforts by central banks raise concerns related to the overall supply of HQLA. As asset purchase programmes (such as the ECB’s Asset Purchase Program (APP) continue or are extended, this reduces the stock of HQLA available to the market. Although many central banks have introduced lending programmes to make purchased assets available, these are of limited help in terms of net supply as they operate on a collateral vs collateral basis.

Sources:

- Mind the gap? Sources and implications of supply demand imbalances in collateral asset markets, BIS Quarterly Review, September 2013
- Collateral is the new cash: the systemic risks of inhibiting collateral fluidity, ICMA, April 2014

See also under Chapter 5 for incremental collateral requirements for OTC derivatives.

6.4.2. Segregation issues: collateral holding structures

Triparty collateral management is particularly negatively impacted by requirements around segregation, as it impacts the ability to pool and optimize collateral. A number of new regulations may impose account and collateral segregation requirements, which limit the ability to mobilise collateral and increases costs.

Some of the key regulations in the EU on this topic are Directive 2011/61/EU of the European Parliament and of the Council of 8 June 2011 on Alternative Investment Fund Managers (AIFMD) and Directive 2009/65/EC on the coordination of laws, regulations and administrative provisions relating to undertakings for collective investment in transferable securities (UCITS, regarding the segregation of AIF/UCITS assets from other assets). Similar provisions can be found in Art 16 of MiFiD II and the draft implementing directive. In addition, CSDR specifies the obligation for CSDs and their participants to offer clients the choice between omnibus and individual segregation and disclose the costs and the risks). The ECB’s COGESI Group is looking in more detail at collateral holding and segregation requirements and practices as part of its work on the harmonisation of collateral management arrangements. On this specific point, ESMA is expected to produce a conclusion report by the end this year following the call for evidence paper release in June 2016 on segregation requirements and custody services under the AIFMD and UICITS V. This report should provide the industry with recommendations on the way to apply these requirements, hopefully in a harmonised way all across the EU.

Restrictions on the use and management of collateral would limit the ability to pool and transfer collateral in an efficient way, and thereby impact the ability of investors entering into counterparty transactions requiring that collateral either be provided or received, which in turn reduces risk in the financial system.

This is especially important for the business models of a tri-party collateral manager and securities lending agent, which are very different from core custody services. Collateral management is an environment in which beneficial ownership of collateral changes frequently (including intra-day) as part of a dynamic process, whereas custody tends to involve beneficial ownership of securities changing less frequently (i.e., held for longer periods). Segregation along the custody chain would fundamentally hinder that optimisation process, and limit the ability to pool collateral

In a situation where segregated accounts are used, it is necessary for the relevant data to be stored and maintained in multiple locations (i.e., at each intermediary level). In a tri-party collateral management model, in which positions and exposures are changing frequently, it would be impossible for market infrastructure (with settlement cycles and other obligations) to keep up with frequent changes of collateral at the end investor level if a fully segregated account structure is required.

6.4.3. Operational issues and STP

Lack of harmonisation of processes and practices, and sometimes low levels of automation in collateral management can negatively impact collateral fluidity and increase risks

Product definition – As part of the drive for standardisation to surmount the barriers identified by Giovannini, many of the post-trade instruction processes into agent, CSD and CCP have simplified both SFT and cash instructions into common messages.

This has been visible in Europe since 2004 in the preparatory steps that were being paved for T2S integration where as part of the core principles a decision was made not to include SFT products or attributes at a mandatory level within the infrastructure. Since 2008, SFTs have become a key component within financial markets and additional product level definitions are now required for both clearing efficiency and regulatory transparency to differentiate from other trade types and enable lifecycle automation.

Product messaging - Consistent and harmonised messaging standards will drive efficiency in repo post-trade processing and will help foster automation in collateral management. Various regulatory requirements (e.g. SFTR, MiFID2, EMIR, CSDR) will introduce unique identifiers (ISIN, LEI, UPI, UTI) and the use of ISO 20022 standard for messaging. This work on unique identifiers has been limited so far to OTC derivatives and needs to be extended to cover SFTs. The ISO 20022 framework needs to be evolved to fully capture the repo product and allow for a consistent identification of SFTs throughout the post-trade process. In the context of the implementation of the SFTR regulation ESMA has already started on level 2 a comprehensive analyses to use standardised identifiers (e.g. UTI for SFTs). Such work will be developed during 2017.

Collateral messaging is one of the three priority areas that the ECB's COGESI Group is focusing on in the context of its work on the harmonisation of collateral management arrangements (see 6.3 above). The summary below shows the numerous message domains for the processing of investment products, which will cause conflicts in the end-to-end environment. This is because of the additional translation and mapping exercises required in each layer of trade management.

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Figure 53: Message protocols

Function	Cash Equities & Fixed Income	FX	Listed Derivatives	OTC Derivatives	Funds
Pre-Trade	FIX	FIX	FIX	FpML	ISO
Trade	FIX	FIX	FIX	FpML	ISO
Post-Trade	ISO	ISO	ISO	FpML	ISO
Clearing/ Pre-settlement	ISO	ISO	ISO	FpML	ISO
Asset Servicing	ISO	N/A	ISO	FpML	ISO
Settlement	ISO	ISO	ISO	FpML	ISO
Pricing/Risk/Reporting	ISO	ISO	ISO	FpML	ISO
Trade Association	ICMA/ISLA/AFME	GFMA	FIA	ISDA	IA/AIMA

FIX	ISO	FpML
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Source: ICMA, Cogesi Workstream 3 papers.

The Grid above shows the message constituencies and trade associations contributing to product message standards, transmissions and best practice. Collateral product falls into all of these currently.

Message standardisation within ISO 20022: Users will be subject to major changes in the following years (upcoming T2S migrations, various market reforms, impact of CSDR, MiFID II / MiFIR and EMIR etc.) and need a common target standard for system developments. Where possible, the implementation of ISO 20022 standards needs to take into account the timing and impact of these changes, with a view to minimize system changes and client impacts. Prior to defining a transition plan, it should be verified to what extent ISO 20022 messaging standards have been defined and structured to comply with the new regulatory standards on instruction, reporting etc. which are being set forth by regulations such as CSDR, SFTR and others.

Consistent Legal definitions: Document differences may impact standardization of product delivery – documentation such as the GMRA and GMSLA underpin the legal framework for SFTs. This will create different requirements in the transmission of the product for clearing and reporting for institutions active in more than one agent. Linking the legal framework then to the business processing would assist consistency and therefore efficiency in transmission. As an example the derivatives community through ISDA benefit from a legal and product standard message (FPML) linked closely to the product lifecycle transmission for consistency of translation under central governance. A sub-committee within ISDA is tasked with ensuring that the legal terms of the product and external reporting requirements are configured into the product messaging and acknowledged as part of the product standard. In contrast, the securities industry is more fragmented and acknowledgement of the legal and product constructs ahead of new regulatory demands in product processing will reduce reconfiguration and translation demands to the market

infrastructures. Finally, this is also an area where digital innovations (e.g. smart contracts) might help to integrate legal and reporting aspects.

Regulatory change: The industry will need to define the operating model for the mandatory buy-in & settlement discipline regimes as part of CSDR:

Whilst it is proposed that to exempt STF's up to 30 days from execution from mandatory buy-ins, longer term SFT's and generic margin settlements would be in scope, the trading counterparties and CSD need to identify inflight transactions that may be subject to the buy-in. There are already ISO 20022 specific buy-in messages available in clearing and CSDs that potentially could be reused

Settlement fail penalty calculation and collection of penalties and distribution to the receiving parties shall also apply to failing settlements related to collateral movements. A common report format would be very useful here to standardize the flows across various actors and market infrastructures.

Blockchain and distributed ledger technologies: currently, significant attention is being paid to the possibility of new technologies, and in particularly Distributed Ledger Technology (DLT), potentially being used in the field of collateral management services.

6.4.4. Collateral optimisation

Collateral optimisation is the use of specific infrastructures and protocols that, once aggregation has taken place, allow market participants to maximise the effective and efficient use of their asset portfolio to meet collateral obligations. With collateral optimisation, assets are better sourced, priced, and allocated.

Collateral optimization models can vary from firm to firm, but essentially attempt to do the same thing: ensuring the most efficient use and lowest cost of managing collateral outflows. This is achieved by centrally pooling all usable collateral available to the firm or enterprise (the 'collateral hub'), often across different business lines or even geographic locations, and then allocating this pool against its various margin obligations. The methodology for allocation is based on a minimum eligible collateral quality or lowest cost of collateral basis (i.e. a 'cheapest-to-deliver' logic). As collateral optimization becomes more important as a means for investment firms to reduce costs, this process is increasingly automated, employing algorithms to manage the overall process.

Potential risks: With the increasingly widespread use of automated optimisation systems, eligible but lower-quality collateral might be provided to meet obligations. This is because these automated systems operate under a "cheapest-to-deliver" algorithm. This creates two potential problems. First, in this circumstance, transactions are collateralised with lower quality along with higher quality assets; and second, in periods of stress lower quality collateral is more susceptible to liquidity issues, higher volatility, and, therefore, price swings. Thus, an accurate pricing of the collateral may not be straightforward.

6.4.5. Collateral mobilisation

A possible way to address the challenges around collateral shortage could be to extend the pool of available collateral. This could include the use of alternative forms of collateral, or enhancing the list of eligible collateral. For instance, assets such as gold, equities and high-grade corporate debt may have a role to play alongside other already favoured collateral assets, i.e. cash, government bonds and covered bonds. Similar debates are also pertinent in the context of collateral for private

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contracts, where another alternative under discussion has been the utilisation of credit claims (loans) as repo collateral, in lieu of the use of the hitherto favoured bond obligations (securities)¹⁷⁰.

Highly regulated investment funds (e.g. UCITS) including ETFs should also be accepted as collateral.

6.4.6. Collateral transformation

The collateral transformation process takes a pool of collateral that is available, but is ineligible (or not creditworthy) for regulatory purposes, and exchanges it for another pool of securities that meets the eligibility requirements of a firm's collateral obligations.

There are many ways to achieve a collateral upgrade, e.g. a market participant could lend out corporate bonds and borrow a high-quality security, such as a government treasury bond. Similarly, a firm could repo out the same corporate bond and then use the cash proceeds to purchase a high-quality eligible security. Given the increased demand for high-quality collateral, it is likely that the demand for collateral transformation services might increase although this expectation so far is not supported by findings such as the CPMI report on collateral management services of September 2014¹⁷¹.

Potential risks: An obvious consequence of collateral transformation is that it increases the linkages in the financial system and thus in effect replaces firm-specific, idiosyncratic risk with contagion and systemic risk. While lessening the probability of collateral shortages of high-quality eligible assets, it comes at a cost of increased interconnectedness through securities lending and repo transactions and other transformation services, and requires very efficient transfer and settlement mechanisms.

6.4.7. Incremental Collateral Post-trade requirements for OTC derivatives

The previous sections describe the processing requirements associated with generic collateral movements, however they are generated. When it comes to OTC derivatives, there are a series of incremental post-trade processing steps that are required, before such collateral demands are transformed to "generic" collateral movements, which can be handled by the collateral systems. In addition, and as mentioned above, the incremental number and volumes of collateral movements generated by the new collateral and margin requirements, are expected to put huge pressure on existing infrastructures, requiring a possible complete overhaul.

With respect to the OTC derivatives specific post-trade collateral related activities, which are required before such collateral demands are transformed to "generic" collateral movements, these include:

- Own and counterparty verification – to establish that the "pairing" is subject to the new requirements. Specifically, the new margin requirements are being phased in over a period of several years, depending upon the outstanding amount of derivatives held by each entity. For the new regulation to apply, both entities in a transaction must be subject to such requirements. As such, each counterparty must verify and state to the counterparty that it is (or it is not) subject to such requirements;

¹⁷⁰ IOSCO Securities Markets Risk Outlook 2016

<https://www.iosco.org/library/pubdocs/pdf/IOSCOPD527.pdf>

¹⁷¹ <https://www.bis.org/cpmi/publ/d119.htm>

- Putting in place the new Credit Support Annexes (at least new additional agreements – one of VM and one for “new” IM) which govern the new regulatory requirements associated with the margining of non-cleared trades;
- Trade Population Verification – making sure that the two counterparties have the same portfolios of trades and have the same taxonomy of trade types;
- Allocation of Trades to Risk and Class Bucketing – Asset or Risk based (to feed the SBA based margin model);
- Margin, Collateral Call and Payment processes – the process of feeding into the traditional collateral processing systems;
- Dispute resolution – the process of resolving disputes in any of the above steps.

With respect to the additional pressures that the new requirements create to the existing infrastructures, it should be noted that the existing collateral management systems are based on primarily time-intensive manual processes that are not easily scalable. As such, they are prone to high operational risk and they lack transparency. What is required is, streamlined, scalable solutions with real time access to settlement and fail updates for immediate follow up. A number of entities such as Acadia Software and DTCC are working together with Euroclear and others to build such systems.

With the advent of clearing, a big portion of OTC derivatives (estimated to be as high as 70% or higher of the outstanding OTC derivatives) has been (or is expected to be moved soon) to a few CCPs. The result of this migration has been a split of the single netting set under the ISDA Master Agreement into several netting sets (each corresponding to a CCP in which otherwise OTC derivatives are now being cleared). Although, we do not have precise estimates of the associated loss in offsetting opportunities, estimates are in excess of \$1 trillion of additional collateral. There have been suggestions that potential synergies in collateral management may exist in cross-margining opportunities among CCPs – each of which has its own netting set. For such synergies to be materialized, many thorny issues associated with the so-called CCP inter-operability need to be addressed. As of now, this work belongs firmly in the category of the “to-do” list.

Moreover, the requirement to margin those OTC derivatives trades that are not cleared (or currently not margined) is expected to lead to yet another trillion of additional collateral.

These figures, speak to the quantum of the impact on collateral demand and possible shortages, created by the new regulation of OTC derivatives.

6.4.8. New tools for collateral management

New models are being discussed, which could enable access to a wide range of eligible assets (e.g. virtual collateral pools allow for assets mobilisation, without having to move assets from one location to another). New services are currently analysed that could potentially be used to record, mobilise, monitor and track collateral, including the use of distributed ledger technology¹⁷².

6.4.9. Fragmentation of infrastructures and collateral pooling services

As per ISSA report, pools of collateral exist in many central securities depositories and custodians, across different jurisdictions. The fragmentation caused by these different pools makes the mobilisation of collateral to the right place at the right time difficult. In order to optimize the

¹⁷² ECB Occasional Paper Series, Pinna/Ruttenberg: *Distributed ledger technologies in securities post-trading*, <https://www.ecb.europa.eu/pub/pdf/scpops/ecbop172.en.pdf>

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collateral management process, the financial institution needs to have a view across its products and markets. This is probably the unique way that a global financial institution can efficiently allocate collateral.

In light of the need to mobilize the collateral, a small number of the large international asset aggregators have created solutions in recent years to address such market requirements. The solutions are designed around the concept of a “collateral pool” and the ability for customers to mobilize collateral both domestically and internationally, irrespective of underlying asset type and location. They are designed also to ensure that assets remain in the local jurisdiction.

In this context, the ECB’s COGESI is undertaking important work in relation to the harmonisation of collateral management harmonisation, which also aims to achieve a higher degree of mobility (interoperability) between collateral pools. This work is hoped to foster and coordinate ongoing industry initiatives, in particular in relation to tri-party interoperability (see section 6.3. above).

Another major initiative, which is expected to help address the ongoing fragmentation of collateral in Europe, is the roll-out of T2S, in conjunction with, in the longer term, Eurosystem intentions to investigate the creation of a Common Eurosystem collateral management system.

7. Legislative and regulatory framework

7.1. Introduction and overview

In this chapter, the post-trade landscape is surveyed in terms of its legislative and regulatory content. The aim is to review the scene as it presently stands and to identify achievements, any gaps, and things that do not work as well as intended, particularly in the context of the agendas set by the Giovannini Reports and the G20 post-crisis workplan.

The structure of this chapter is as follows. First, the legal landscape is critically evaluated. Existing laws have been grouped into three collections for assessment: the principal legislation applicable to the EU post-trade sector, other legislation which makes a major contribution to the sector, and thirdly legislation which is not primarily targeted at the sector but nonetheless has a substantial impact. Some legislative work-in-progress relevant to the sector is described. Finally, conclusions are drawn on legislation, and reference to the work on taxation issues is presented.

The review of legislation set out here does not look at the possible impact of legislation in development, except in a few selected cases. The law is taken to be that in force, or in final form, as at 30 June 2016; amendments to legislation are not specifically mentioned but can be assumed to have been recognised.

A preliminary comment may be made concerning any assessment of legislation. Very frequently, regulatory legislation has been introduced mainly to fit the operational manner in which the market structured itself and sometimes as response to a failure in the market-place either of conduct or of institutions. While most legislation contains some provision which is designed to facilitate business, other elements of regulation do not pursue the facilitation of business but address identified risks. In deciding whether a piece of legislation has been 'successful', it is therefore important to bear in mind the reasons for its creation.

A second preliminary point may be that there can be differences among the laws of Member States. However, as laws of different Member States pursue identical objectives, such as protecting the investor against an intermediary's insolvency, differences are not in most cases sources of legal risk. We have not identified any case where operations were impossible due to legal differences.

A third preliminary point is that an important part of the legislative framework is enshrined in traditional concepts such as law of goods and law of contract. Changing those concepts is very likely to result in legal uncertainty until new doctrine or jurisprudence is settled.

Finally, it should not be ignored that there are two principal legislative methods in the EU. Regulations have direct effect; directives have to be transposed by Member States. Both types of legislation are open to differing interpretations as they fit into the legal and regulatory traditions of Member States; it can take years before consensus emerges. Directives are more likely to lead to divergence between Member States, where the scope and manner of transposition can differ widely. Regulations do not require transposition, and so can avoid some of the divergence experienced with Directives; but Regulations can (subject to ex-post ruling by the European Court of Justice) be interpreted differently in different Member States, and they have their own drawbacks, some of which are identified in the discussion below.

7.2. The legal landscape for post-trade activities

In light of the description of the existing business environment and practices in the post-trade sector, the first question to consider is how the law and regulation correspond to the practices and

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processes described in the preceding chapters. The principal legal instruments relating to post-trade activities at EU level is mapped against those practices and processes in Table O¹⁷³.

¹⁷³ Table O is not an ‘executive summary’ of Section 7 of this Annex. It is rather an attempt to map the areas of activity described in preceding chapters to the existing legislative framework.

Table 0: Post-trade activities: summary of relationship to principal EU post-trade legislation

1. Securities	SFD 1998	FCD 2002	SRD 2007	EMIR 2012	AIFMD and UCITS 2011 and 2014	MiFID and MiFIR 2014	CSDR 2014	SFTR 2015
Trading						Regulation of investment firms and trading venues		
Issuance/ issuer services							Notary function Dematerialisation of securities Choice of Issuer CSD by issuers	
Matching/ confirmation							Brokers obliged to match on T or T+1	
Clearing	CCP defences against clearing member insolvency			Regulation of CCPs Regulation of clearing members		Venue access to CCPs CCP access to data feeds STP Indirect clearing	CSD access to data feeds from CCPs CCP access to CSDs	
Settlement	Finality of transfer orders					Choice of CSD by traders	Settlement cycle and discipline regime Regulation of CSDs	
Custody/ Asset servicing					Depositaries' duties/ restitution liability Account structures in holding chain	Custody regulation	Permitted for CSDs as non-'banking' activity Rules on segregation	
Transparency					Reporting by depositaries	Post-trade transparency Transaction reporting	Reporting of settlement internalisation	

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2. Derivatives	SFD 1998	FCD 2002	EMIR 2012	AIFMD and UCITS 2011 and 2014	MiFID and MiFIR 2014	CSDR 2014	SFTR 2015
Pre-trade and Trading					Regulation of investment firms and trading venues		
Matching/confirmation			Timely confirmation and reconciliation of uncleared OTC derivatives				
Clearing	CCP defences against clearing member insolvency		Regulation of CCPs Mandatory clearing of OTC derivatives Regulation of clearing members		Venue access to CCPs CCP access to data feeds Indirect clearing of exchange-traded derivatives		
Settlement	'Netting' protected in designated system	Close-out netting effective as part of collateral arrangement					
Asset servicing				Duties of depositaries			
Transparency			Derivatives reporting to TRs Regulation of TRs	Reporting by depositaries	Post-trade transparency Transaction reporting		

3. Funds and Liquidity Tools	SFD 1998	FCD 2002	EMIR 2012	AIFMD and UCITS 2011 and 2014	MiFID and MiFIR 2014	CSDR 2014	SFTR 2015
Funds	Transfer Agents potentially in-scope but none designated			Regulation of fund management and distribution [but not post-trade]	Regulation of investment firms and trading venues [but not post-trade]	Transfer Agents partially in-scope Funds held in CSDs Settlement discipline applies to ETFs	Reports by UCITS/AIFMs on use of SFTs
Liquidity tools: repo and securities lending	Clearing of repos and securities loans in-scope	Repos classified as TTCA – legally recognised	Repo obligations for CCPs' cash assets	Duties of depositaries apply Repo and securities lending restricted	Transparency rules apply Clients' SFTs to be collateralised	Agency securities lending by CSDs is 'banking' service	Reporting to TRs of SFTs
Liquidity tools: collateral	'Collateral security' protected in designated system and central bank transactions	Formalities abolished Enforceability assured Re-use allowed	Collateralisation of uncleared OTC derivatives Margining of cleared products Custody of margin by CCPs	Limits on use of fund assets as collateral Limits on acceptance of collateral	Use of TTCAs restricted	Only dematerialised securities eligible as financial collateral	Regulation of re-use

Key

Bold type – primary aim of legislation

Grey shading – impact on infrastructures

Bold border – impact on firms

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7.2.1. Key post-trade legislation

Evidently, the most important pieces of legislation in the post-trade sector are (together with their associated implementing directives, regulations and technical standards) the following:

- a. Directive 98/26/EC of the European Parliament and of the Council of 19 May 1998 on settlement finality in payment and securities settlement systems (Settlement Finality Directive or SFD)
- b. Regulation (EU) No 648/2012 of the European Parliament and of the Council of 4 July 2012 on OTC derivatives, central counterparties and trade repositories (EMIR)
- c. Regulation (EU) No 909/2014 of the European Parliament and of the Council of 23 July 2014 on improving securities settlement in the European Union and on central securities depositories and amending Directives 98/26/EC and 2014/65/EU and Regulation (EU) No 236/2012 (CSDR)
- d. Directive 2002/47/EC of the European Parliament and of the Council of 6 June 2002 on financial collateral arrangements (Financial Collateral Directive or FCD)
- e. Directive 2014/65/EU of the European Parliament and of the Council of 15 May 2014 on markets in financial instruments and amending Directive 2002/92/EC and Directive 2011/61/EU, and Regulation (EU) No 600/2014 of the European Parliament and of the Council of 15 May 2014 on markets in financial instruments and amending Regulation (EU) No 648/2012 (MiFID and MiFIR respectively)
- f. Regulation (EU) 2015/2365 of the European Parliament and of the Council of 25 November 2014 on transparency of securities financing transactions and of reuse and amending Regulation (EU) No 648/2012 (SFTR)
- g. Directive 2011/61/EU of the European Parliament and of the Council of 8 June 2011 on alternative Investment Fund Managers and amending Directives 2003/41/EC and 2009/65/EC and Regulations (EC) No 1060/2009 and (EU) No 1095/2010 (AIFMD)
- h. Directive 2014/91/EU of the European Parliament and of the Council of 23 July 2014 amending Directive 2009/65/EC on the coordination of laws, regulations and administrative provisions relating to undertakings for collective investment in transferable securities (UCITS) as regards depositary functions, remuneration policies and sanctions (UCITS V)
- i. Directive 2007/36/EC of the European Parliament and of the Council of 11 July 2007 on the exercise of certain rights of shareholders in listed companies (Shareholders Rights Directive or SRD).

These legislative measures are briefly described in sections 7.3.1. - 7.4.5.

7.2.2. CPMI-IOSCO

At international level, the CPMI/IOSCO 'Principles for Financial Market Infrastructures' (PFMI)¹⁷⁴ dated April 2012, sets out regulatory standards expected to be implemented by financial market infrastructures and supervisory authorities. In general, the PFMI rules principles and recommendations have been to a large extent¹⁷⁵ integrated into EMIR and CSDR thereby integrating them into the EU legal framework. The EU may thus point to compliance with the global standards as a significant achievement and advance towards global competitiveness and consistency.

¹⁷⁴ www.bis.org/cpmi/publ/d101a.pdf

¹⁷⁵ See CPMI-IOSCO assessment report for the EU, <http://www.bis.org/cpmi/publ/d128.htm>

7.2.3. Other relevant legislation

In addition to these principal items of legislation, the following measures should also be mentioned in view of their relevance to the post-trade sector:

- a. Directive 2014/59/EU of the European Parliament and of the Council of 15 May 2014 establishing a framework for the recovery and resolution of credit institutions and investment firms and amending Council Directive 82/891/EEC, and Directives 2001/24/EC, 2002/47/EC, 2004/25/EC, 2005/36/EC, 2011/35/EC, 2012/30/EU and 2013/36/EU, and Regulations (EU) No 1093/2010 and (EU) No 648/2012, of the European Parliament and of the Council (BRRD).
- b. Directive 2001/24/EC of the European Parliament and of the Council of 4 April 2001 on the reorganisation and winding up of credit institutions (WUD).
- c. Directive (EU) 2015/849 of the European Parliament and of the Council of 20 May 2015 on the prevention of the use of the financial system for the purposes of money laundering or terrorist financing, amending Regulation (EU) No 648/2012 of the European Parliament and of the Council, and repealing Directive 2005/60/EC of the European Parliament and of the Council and Commission Directive 2006/70/EC (AML4).
- d. Regulation (EU) No 575/2013 of the European Parliament and of the Council of 26 June 2013 on prudential requirements for credit institutions and investment firms and amending Regulation (EU) No 648/2012 (CRR).

These legislative measures are briefly described in sections 7.4.6-7.4.9.

In addition to these specific items of legislation, a very extensive set of legislation imposes data collection and reporting requirements. Table P sets out the major items of EU legislation of this type, many of which have multiple reporting requirements¹⁷⁶.

It should further be noted that much secondary legislation has been made under the umbrella of the primary legislation mentioned above, which adds very significantly to the detail and volume of legislation in the areas covered by these instruments. A complete list of the secondary legislation is not set out here.

¹⁷⁶ Cf also Eurosystem response to CMU Call for Evidence, paras B1-B3.

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Table P: Reporting obligations under EU legislation

	WHAT	WHEN	WHO	HOW	DETAILS
EMIR (in effect 12 February 2014)	Article 9 requires all derivatives trades to be reported (Exchange Traded Derivatives and Over The Counter)	T+1.	All Counterparties (banks, brokers, clearing members, fund managers, corporates and CCPs) have to report, this covers all participants involved in a trade.	To a Trade Repository (authorized by ESMA) Dual-sided reporting (both counterparties must report the transaction) Mandatory LEIs.	Delegation is possible and can be implemented in a very flexible way. Exemptions for natural persons and central banks Substituted compliance if reported to equivalent Third Country TR – art 13
MMSR Money Market Statistical Reporting Regulation (in effect 4 April 2016)	Article 3 of the ECB Regulation ECB/2014/48 requires all euro repurchase agreements and secured transactions, including tri-party repo transactions, FX swaps, overnight index swaps.	T+1	53 large credit institutions in the euro area will report daily (and other participants will follow)	Reporting to National Central Banks which then report to the ECB.	Significant overlaps with EMIR reportable data. Derogations are the ability to report once a week instead of on a daily basis. This is to be decided by National Central Banks.
MiFIR (TBC 3 January 2018)	Article 26 MiFIR creates the obligation for investment firms to report transactions when providing investment services and/or performing investment activities. Operators of trading venues also have to report transactions on behalf of entities	T+1	All counterparties and all financial instruments	Reporting can be done (1) by the investment firm, (2) an ARM acting on behalf of investment firm, (3) by the trading venue through whose system the transaction was completed. ARMs, trading venues and firms report will be sent to National Competent Authorities (28 NCAs). Dual sided reporting LEI as mandatory to trade and report.	Exemptions for natural persons but different than EMIR. TR can become ARMs. For OTC derivatives, the MiFIR requirement is a subset of EMIR data * (<i>see below</i>) Usages of ISIN but no references to global codes with regards to product and transaction identifiers. Deemed compliance if already reported to a TR under EMIR – art 26(7) Orders transmitted must also be reported if details not supplied with order

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	WHAT	WHEN	WHO	HOW	DETAILS
	Articles 6 and 10 MiFIR require venues to publish price, volume, time of transactions in shares, DRs, ETFs, bonds, structured finance products, emissions allowances and derivatives	real time	Trading venues	RTS 1, 2 in development	
	Articles 20 and 21 MiFIR require firms to publish price and volume of transactions done OTC or by systematic internalisers in shares, DRs, ETFs, bonds, structured finance products, emissions allowances and derivatives	real time	Investment firms	APA	
	Article 27 MiFIR requires trading venues to provide reference data to competent authority	before trading commences	Trading venues	RTS 23 in development	
	Article 31 MiFIR requires investment firms and trading venues to provide data on volume of transactions subject to portfolio compression	real time	Investment firms and trading venues	APA	
MiFID (TBC 3 Jan 2018)	Article 58 MiFID introduces transparency on positions of commodity derivatives and emissions allowances	weekly daily	Investment firms and trading venues	Investment firms must publish data Venues must report breakdown to competent authority	

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	WHAT	WHEN	WHO	HOW	DETAILS
SFTR (TBC H1 2018)	Article 4 creates obligation for counterparties report the details of any SFT they have concluded	T+1	(1) investment firms and banks, (2) CCPs and CSDs (3) insurance, reinsurance, UCITS, AIFMs and retirement schemes; (4) non-financial counterparties/corporate s.	Report to trade repositories (authorized by ESMA-extended service) Mixed single sided and dual sided reporting. LEI as mandatory to report.	Central banks and some SMEs are excluded. Reporting obligation will be phased-in. Overlaps with MiFID/R Harmonisation of formats encouraged – art 4(10) Substituted compliance if reported to equivalent Third Country TR – art 21
REMIT (in effect since October 2015 and then April 2016).	Article 3-11 of REMIT and implementing Regulation on wholesale energy market integrity and transparency	T+1	Wholesale energy firms/commodity	Report to Regulatory Reporting Mechanisms (RRMs), supervised and authorized by ACER (the EU Energy Agency). LEI to be used	National regulatory authorities are responsible for ensuring REMIT is enforced the transaction and data reporting framework should allow for EU wide market monitoring by ACER without any double reporting with EMIR and MiFID. Indicated cooperation between ACER, ESMA and NCAs.
AIFMD (In effect since July 2014, but to be reviewed in 2017)	AIF have to report their transactions when conducted under EMIR or when they decide to use an ARM under MiFIR. Article 3 (state that AIFs need to report their exposures to their national competent authorities, this includes derivatives	Per quarter, twice a year and once a year	All alternative investment funds and their managers	Direct report to the NCA using venues like the TRs. LEI to be used.	ESMA may request competent authority to impose additional reporting requirements – art 24(5)

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	WHAT	WHEN	WHO	HOW	DETAILS
Solvency II 1 January 2016 (followed by a 3 year transitional phase -in full, from 1 January 2020)	Article 35 of Solvency II suggest reporting supervisory authorities and this includes reporting on derivatives.	Quarterly submissions	Insurance and reinsurance firms	EIOPA reviewed the LOGs of the derivatives templates in order to use the same terminology and ensure consistency with EMIR reporting frameworks and SFTR LEIs to be used.	The reporting is specified in EIOPA's preparatory guidelines and further clarified at national level by national supervisory authorities. EMIR TR reporting could ease the reporting burden of Solvency II for derivatives.
Transparency Directive (in effect since 2007)	Arts 9-13 require 'shareholders' to notify acquisition or disposal of shares/voting rights/derivatives etc which give contingent rights	S+4	'Shareholders' and equivalent	to Issuer	ESMA ITS specify formats etc
	Art 21 requires issuers to make 'regulated information' (ie price-sensitive disclosures) available	'fast access'	Issuer or person who has applied for admission to trading on regulated market	to official central storage of home Member State	European electronic access point to be established by 1 Jan 2018 (art 21a) RTS for communications technologies etc
MAR Market Abuse Regulation (3 July 2016)	Art 4 requires reporting of particulars of financial instruments traded	without delay	Operators of RMs, MTFs, OTFs	Competent Authority	
	Art 5 requires reporting of stabilisation transactions	end of 7th day	Issuers, offerors, and entities undertaking stabilisation	Competent Authority	

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	WHAT	WHEN	WHO	HOW	DETAILS
CRAR Credit Rating Agencies Regulation (1 Jan 2017)	Art 8b requires reports on performance of assets underlying structured finance instrument	quarterly	Issuer, originator and sponsor	Published via ESMA SFIs website – can be done by designated reporting entity	Commission Delegated Regulation 2015/3
CSDR	Art 9 of CSDR requires persons who settle securities transactions outside a settlement system to report on this activity	quarterly	'Settlement internalisers'	Competent Authority	
Bank Structural Reform Regulation (in devt)	Various new reporting requirements likely to be introduced, relating to: Assets and trading activities for comparison with thresholds Market making etc falls within exclusions (Tier 2 core banks) P&L, trading, VaR, open interest etc		Banks	Competent Authority	
Money Market Funds Regulation (in devt)	Fund managers to report on portfolio indicators, stress tests etc for MMFs under management		Operators of MMFs	Competent Authority	

7.3. Principal post-trade legislation

7.3.1. Commentary on principal legislation – SFD

The SFD was initially developed to provide protection to payment systems in light of the Lamfalussy report of 1990. During the legislative process the directive was amended to encompass securities settlement systems as well; subsequently amendments have been made which embrace CCPs too. The Directive primarily protects ‘designated systems’ and their participants from certain challenges in the event of a participant’s insolvency, and thus brings a degree of legal certainty and confidence to the default management process of ‘designated’ infrastructures.

National implementation of the SFD has, however, not been carried out consistently. In particular:

- a. The concepts of ‘relevant register, account or system’ has been transposed or interpreted in divergent ways.
- b. The T2S advisory group has reported on inconsistent transposition of the SFD¹⁷⁷. The issue was originally identified as problematic in 2006 by EBA Clearing¹⁷⁸.
- c. It is noteworthy that the various current explications of ‘settlement finality’ (SF1: irrevocability of instructions/transfer orders; SF2: irrevocability of matching; SF3: finality and irreversibility of settlement book-entries) are not reflected in the SFD, leading to different interpretations of what the SFD intends to achieve.
- d. The SFD does not demand a notification procedure for when a participant becomes insolvent.
- e. The SFD does not impose a common standard for the ‘moment of entry’ of a transfer order into the designated system, for the purposes of article 3(1).

The SFD addresses the following Giovannini and other objectives:

- a. Giovannini Barrier 4 (absence of intra-day settlement finality);
- b. Giovannini Barrier 15 (uneven application of national conflict of law rules);
- c. Lamfalussy Report of 1990 on systemic risk¹⁷⁹.

The following remarks may be made regarding the interplay between the SFD and other EU legislation:

- a. Various legislative measures have conflicts-of-laws provisions but overlap is limited. Most significant are FCD, art 9, and WUD, arts 24-27. These are compared in Table Q. From Table Q it may be concluded that the SFD and FCD apply different conflict of law rules in different situations; the formulation of the conflicts of law rule is different which could lead to different interpretations; the WUD approach appears to be ambiguous – in summary, that EU law is inconsistent and could at worst give more than one interpretation to a single problem.
- b. Although the SFD provides protection for ‘payment/transfer order netting’, it does not provide a comprehensive ‘netting law’ for Europe addressing e.g. close out netting in (OTC) derivatives transactions¹⁸⁰. A range of netting legislation exists in the EU, briefly compared in Table R. Article 7 of the FCD also provides substantive protection for close-out netting, in the context of a financial collateral arrangement. However, it is open to

¹⁷⁷ See T2S Advisory Group, ‘Conflict Of Laws Issues In T2s Markets - a fact finding exercise’, ECB (December 2015), pages 3 and 56.

¹⁷⁸ see http://ec.europa.eu/internal_market/financial-markets/docs/settlement/consultation-results/eba_en.pdf

¹⁷⁹ <http://www.bis.org/cpmi/publ/d04.htm>, pp 4-8.

¹⁸⁰ Cf Unidroit Principles on Close-out Netting, <http://www.unidroit.org/instruments/capital-markets/netting>

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question whether the SFD addresses the same concept of ‘netting’ as the FCD. The definitions are not identical¹⁸¹: the FCD is specifically concerned with ‘close-out’ netting¹⁸², whereas the context of the SFD in its original form (including the definition) is the protection of payment and securities settlement systems, which apply ‘multilateral’ netting schemes¹⁸³.

- c. It should be mentioned that the potential interplay between the SFD and the BRRD is not yet fully established. Here there is the potential for additional complexity though also the opportunity for Member States to introduce clarifications which may solve some of the issues mentioned in this section.

It is now accepted that all payments, clearing and settlement infrastructures should achieve designated status and thereby obtain the insolvency protection of the SFD. This is formally required by both EMIR¹⁸⁴ and the CSDR¹⁸⁵ for an EEA-based infrastructure to obtain authorisation as a CCP or CSD.

However, it can be claimed that the SFD protection is less suitable tailored for CCPs than for CSDs and payment systems, because the range of actions taken on default by a CCP which may be open to insolvency challenge is much broader.

- a. The primary objective of the SFD is to assure the finality of ‘transfer orders’¹⁸⁶. In broad terms, transfer orders can be regarded as settlement instructions given to a settlement system¹⁸⁷. CCPs are not, from a functional perspective, ‘settlement’ systems and it is not straightforward to regard cleared transactions as a species of ‘transfer order’.

¹⁸¹ SFD, art 2(k); FCD, art 2(1)(n).

¹⁸² Cf Report of the European Financial Markets Lawyers Group, *Protection For Bilateral Insolvency Set-Off And Netting Agreements Under EC Law* (October 2004), which contains a jurist-linguist analysis of this term and the concept of netting as used in various directives and regulations and applied across Member States.

¹⁸³ Cf ECB Publication, ‘The Payment System’ (2010), ed Tom Kokkola, Chapter 1, section 4.1.

¹⁸⁴ Art 17(4).

¹⁸⁵ Art 39(1).

¹⁸⁶ Articles 3, 5.

¹⁸⁷ Article 2(i). The concept also applies to payment systems (out of the EPTF scope).

Table Q: EU rules for determining applicable law to securities questions

Legislation	Rule	Comment
Settlement Finality Directive (SFD)	Rights to collateral determined by law of Member State where register, account or centralised deposit system is located.	Limited to collateral provided in connection with designated systems. The purpose of the rule is to identify one, and only one, legal system under which legal questions are answered. But the rule points to more than one system of law since more than one register/account/system can be implicated. So the rule cannot be said to have fulfilled its purpose (cf WUD).
Financial Collateral Directive (FCD)	Four legal questions relating to book entry securities collateral governed by law of Member State where relevant account is maintained.	Applies to financial collateral arrangements, but does not assign a legal system to determine whether financial collateral arrangement actually exists. Not clear which legal system applies in two-party arrangement.
Winding-up Directive (WUD)	Enforcement of proprietary rights in registered instruments governed by law of Member State where register, account or centralised deposit system is located.	Does not unambiguously assign a single legal system (cf SFD).
EU Insolvency Regulation ¹⁸⁸	Location of book entry securities is Member State where register or account is maintained.	Relates primarily to allocation of assets between concurrent insolvency proceedings.

¹⁸⁸ Regulation (EU) 2015/848 of the European Parliament and of the Council of 20 May 2015 on insolvency proceedings.

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Table R: EU Netting Legislation

Legislation	Effect	Comments
SFD, art 3	Netting legally enforceable in insolvency proceedings against a participant in a designated system. 'Netting' applies to obligations resulting from transfer orders between participants.	Netting appears to mean multilateral netting within the operational context of a payment or securities settlement system. Most Member States have not used the SFD to protect 'netting' as between direct participants and their clients. Avoidance actions under insolvency law are expressly disappplied under art. 3(2)
FCD, art 7	Close-out netting provisions to take effect in accordance with their terms notwithstanding insolvency or reorganisation measures affecting either party. 'Netting' provision must be part of a financial collateral arrangement or a statutory rule.	The directive is silent as to the application of avoidance actions.
WUD, art 25	Netting agreements governed solely by governing law of contract (subject to stays in arts 68 and 71 of BRRD). 'Netting' not defined.	Avoidance actions may apparently be taken if permitted under the governing law of the contract (cf. art. 30).
BRRD, arts 49, 68, 76, 77	Netting to take place before exercise of bail-in. Termination and netting rights suspended for 2 business days in resolution. Safeguards for netting arrangements in partial transfers. 'Netting' means arrangement for converting a number of claims or obligations into a single net claim, and includes close-out netting within FCD and netting within SFD.	The principal criticism of these arrangements is the risk of inconsistency between Member States in the interplay between bail-in and netting or set-off. Since Member States have a discretion as to what is bailed-in, and the definition of netting allows for narrow or broad interpretations, a variety of approaches is emerging, so that netting 'works' in given circumstances in some Member States but not in others.
CRR, arts 206, 295-6, 390, 429	Netting recognised as risk-reducing for capital, large exposures and leverage ratio	To obtain the benefit, formal legal opinions must be obtained from lawyers in all relevant jurisdictions, assessing the effect of the legislation cited above.
EMIR, art 39(9)	Netting of house vs client accounts prohibited in compliant segregation arrangements.	

- b. The SFD protects 'netting', protects designated systems from retroactive effects of insolvency proceedings, determines that the law governing the system determines the rights and obligations of participants in the event of insolvency proceedings, and

protects collateral security¹⁸⁹. However, these protections may not be a total defence for a CCP, which has concerns different from those of a settlement system in the event of a participant default. Participants in a settlement system are concerned that the payment or delivery of securities which is taking place across the system should not be unwound – hence the SFD’s focus on ‘settlement finality’ even in the case of insolvency-law-based challenge. A CCP is faced with a broader range of issues upon participant default. A partial list of issues could include the following:

- Challenge to the CCP’s ability to close out transactions
- Challenge to the CCP’s valuation of positions and collateral
- Challenge to the CCP’s ability to set off credit and debit balances
- Challenge to the CCP’s ability to transfer positions to a non-defaulting participant
- Challenge to the CCP’s ability to transfer assets to a client of a defaulter.

The SFD was not designed to protect a CCP against challenges to its default management process, so there is a risk that several of these actions might not be protected by the SFD, despite being required under the provisions of EMIR (which itself does not directly provide protection). At worst, the status of SFD designation might be perceived by Member States or market participants to be a ‘complete solution’ thereby exposing the CCP, and indirectly its participants, to undue risk if there are in fact weaknesses in the shield.

7.3.2. Commentary on principal legislation – EMIR

EMIR introduces mandatory central clearing of OTC derivatives and reporting to TRs of all derivatives in compliance with the PFMI applicable to CCPs and TRs, and at the same time establishes a unified European regulatory standard for CCPs and TRs. The latter achievement enables CCPs and TRs to operate on a level playing-field with common minimum standards for risk management and conduct of business standards. EMIR also establishes rules for protection of clients in the event of failure of a CCP participant. These may be seen as major advances compared with the patchwork of national regulatory systems in place beforehand.

EMIR includes provisions related to:

- a. Clearing: provisions to ensure that standard derivative contracts to be cleared through CCPs, and provisions to ensure that CCPs comply with a harmonised set of organisational, business conduct and prudential requirements.
- b. Margin and risk mitigation requirements for uncleared OTC derivative transactions, including bilateral exchange of collateral, timely confirmation, portfolio reconciliation and compression, dispute resolution and valuation.
- c. Requirements for CCPs and TRs: provisions to ensure that trade repositories and CCPs comply with a harmonised set of organisational, business conduct and prudential requirements.
- d. Reporting: provisions to ensure that information on all European derivative transactions will be reported to trade repositories and be accessible to supervisory authorities, including the European Securities and Markets Authority (ESMA), in order to give policy makers and supervisors a clear overview of what is going on in the markets.

¹⁸⁹ Articles 3, 7, 8, 9.

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The EMIR legislation addresses the G20 objectives set in Pittsburgh in 2009 and Cannes in 2011¹⁹⁰ of improving over-the-counter derivatives markets by improving the transparency, systemic risk mitigation and market abuse protection, viz:

- a. 'All standardized OTC derivative contracts should be cleared through central counterparties.'
- b. 'All OTC derivative contracts should be reported to trade repositories.'
- c. 'Non-centrally cleared contracts should be subject to higher capital requirements'¹⁹¹.

The following remarks may be made regarding the interplay between EMIR and other EU legislation:

- a. There are unresolved overlaps in the reporting obligations under EMIR, REMIT¹⁹² and MiFID2.
- b. MiFID2/MiFIR are strongly interlinked with EMIR. EMIR provides for the implementation of the G20 clearing obligation in Europe in respect of OTC derivatives. MiFIR introduces a clearing obligation in respect of exchange-traded derivatives and a trading obligation (i.e. to use a regulated venue) in respect of OTC derivatives¹⁹³. EMIR relies, in many cases, on definitions flowing from MiFID – for example, in respect of what is a derivative and what is an OTC transaction.

7.3.2.1. Critical evaluation of EMIR

As EMIR has become better understood, some areas have come in for criticism¹⁹⁴. Points which may be made here include:

- a. EMIR does not overcome the risk of challenge from insolvency laws in relation to a CCP's default-management processes – in particular 'porting' and 'leapfrog' techniques, which are intended to protect clients from the effects of clearing member default. The effectiveness of these processes is at risk unless Member States have implemented specific local protective legislation¹⁹⁵, or the CCP has put in place a legal workaround (such as a security interest in favour of the client). In some cases, the legal structures are complicated and document-heavy¹⁹⁶. In part the difficulty arises because EMIR is an EU Regulation directed at CCPs, rather than a Directive directed at Member States: it is very difficult to change all Member States' insolvency laws through a Regulation, whereas a Directive can bring about such changes¹⁹⁷.
- b. As regards reporting to TRs, there are inconsistencies between EMIR, Dodd-Frank and the requirements of other third countries. Further, there are points of detail where reporting requirements under EMIR do not align conveniently with reporting regimes arising under other EU legislation.
- c. Restrictions set out under EMIR on how CCPs can hold collateral may constrain the ways clearing members can provide collateral to CCPs, and in consequence have the effect of impeding collateral mobility. An example relates to 'tri-party repo' to facilitate

¹⁹⁰ <http://www.g20.utoronto.ca/summits/index.html>

¹⁹¹ In fact this last objective is achieved via the CRR rather than EMIR.

¹⁹² Regulation (EU) No 1227/2011 of the European Parliament and of the Council of 25 October 2011 on wholesale energy market integrity and transparency.

¹⁹³ MiFIR, art 29.

¹⁹⁴ Cf CPMI/IOSCO paper on Implementation monitoring of PFMI (February 2015) which identifies other mismatches <http://www.bis.org/cpmi/publ/d128.htm>

¹⁹⁵ This is the case in some Member States such as the UK.

¹⁹⁶ Cf procedures of Eurex Clearing AG applicable to foreign clearing members.

¹⁹⁷ Cf SFD, FCD, WUD which have this effect.

collateral transfer: EMIR obliges CCPs to hold securities collateral with ‘operators of securities settlement systems’¹⁹⁸. This provision aims at protecting CCP’s assets, e.g. from the potential default of a custodian, by ensuring that margins posted to a CCP are held at low risk CSDs. As a consequence, a commercial custodian cannot offer a tri-party service to manage collateral transfers between a clearing member and a CCP. Clearing members using such a service to handle their collateral efficiently need to have separate arrangements to process transfers of margin securities to the CCPs they access.

7.3.3. Commentary on principal legislation – CSDR

The CSDR is the newest major piece of EU infrastructure legislation and has not yet bedded in. The legislation applies the PFMI standards to CSDs in a harmonised way across the EEA and facilitates competition. The CSDR also introduces a ‘settlement discipline’ regime intended to reduce settlement fails.

According to the European Commission¹⁹⁹, the main objectives of the CSD Regulation are to:

- Increase the safety of settlements, in particular for cross-border transactions, by ensuring that buyers and sellers receive their securities and money on time and without risks;
- Increase the efficiency of settlements, in particular for cross-border transactions, by introducing a true internal market for the operations of national CSDs; and to
- Increase the safety of CSDs by applying high prudential requirements in line with international standards.

The CSDR addresses the following Giovannini barriers²⁰⁰:

- Barrier 3: Differences in national rules relating to corporate actions, beneficial ownership and custody,
- Barrier 6: National differences in settlement periods,
- Barrier 9: National restrictions on the location of securities.

The following remarks may be made regarding the interplay between the CSDR and other EU legislation:

- On access between infrastructures, the CSDR complements MiFID/MiFIR and EMIR provisions, removing many grounds for objection of interoperation between infrastructures carrying out functions in different parts of the value-chain.
- On the regulation of custody and safekeeping services, there is some limited overlap with MiFID/MiFIR, UCITS V and AIFMD (see Table S).
- On account segregation, there is a certain overlap with AIFMD/UCITS V as regards CSD participants which act as fund depositaries.

¹⁹⁸ Article 47(3), as elaborated in Commission Delegated Regulation (EU) No 153/2013, art 44.

¹⁹⁹ http://europa.eu/rapid/press-release_MEMO-14-312_en.htm?locale=en

²⁰⁰ <https://www.ecb.europa.eu/paym/t2s/about/html/giovannini.en.html>

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Table S: Overlap of custody obligations in EU legislation

CSDR	Art. 38(5) and (6)	Participants in CSDs must offer clients omnibus or individually-segregated accounts and inform them of the cost and risk Participants must only offer individual segregation if this is mandated by Member State law as of 17 September 2014 Participants must disclose the level of protection and cost associated with the level of segregation provided
MiFID2	Art. 16(8)	Investment firms holding financial instruments belonging to clients must make adequate arrangements to safeguard the ownership rights of clients, especially in the event of the firm's insolvency Investment firms must prevent the use of clients' financial instruments for the firm's own account except with the client's express consent
AIFMD	Art. 21(8) and (11)	Depositaries must ensure that financial instruments are registered in segregated accounts Depositaries may 'delegate' safekeeping subject to conditions
UCITS V	Art. 22(5) and 22a	As AIFMD art 21
	Art. 22(7)	Depositary and any third party may not re-use assets in custody

Until the Regulatory Technical Standards have taken effect and CSDs have obtained authorisation under CSDR, it is not possible to give a full evaluation of CSDR. However, the following achievements may be noted:

- The CSDR has already had some effects, including adoption in all European markets of the T+2 timeline for the settlement of securities transactions²⁰¹. The dematerialisation/immobilisation of securities is promoted together with the usage of central bank money for settlement of securities transactions²⁰².
- The optionality of degrees of account segregation at CSD level²⁰³ and the harmonisation of finality rules (at three different stages of the settlement process) are also introduced²⁰⁴.
- CSDR addresses the existing fragmentation in the process of handling settlement fails in the EU by imposing mandatory buy-ins. Detailed rules on the buy-in process are in development²⁰⁵.

The following further comments may be made with respect to the CSDR:

- a. The CSDR does not create a uniform practice for the issuance of securities, although it contains a provision on issuer choice and harmonises procedures for assessing requests for market access²⁰⁶.
- b. The securities registration process is not covered by the CSDR. Nor does the CSDR apply to registrars.

²⁰¹ Article 5.

²⁰² Article 3.

²⁰³ Article 38.

²⁰⁴ Article 39(2); on the three modern concepts relating to settlement finality, see above para 7.3.1.

²⁰⁵ One option under development includes making settlement agents responsible for buy-ins. Transferring trading risk from trading parties to settlement agents by imposing responsibility for performance of transactions would make settlement agents guarantors of settlement for their clients.

²⁰⁶ Article 49.

- c. Applying the CSDR to the situation of funds is complex and difficult. Although transfer agents (which may in some respects have analogous functions, in relation to units in funds, to those of CSDs in relation to securities) are excluded from the scope of the CSDR²⁰⁷, CSDs may nevertheless be involved in the issuance and transfer of funds, though not as ‘notary’. Applying the CSDR to the actual activities of CSDs in relation to funds can be problematic, for example as regards the duties of CSDs over the integrity of an issue (which is outside the CSD’s control) or to carry out daily reconciliation (which is not achievable where the fund and its transfer agent reconcile weekly in accordance with the fund’s NAV calculation cycle).
- d. The CSDR limits the provision of banking services by CSDs (unless the value of delivery-versus-payment (DvP) instructions in commercial bank money does not exceed 1% of the total annual value of DvP instructions and EUR 2.5 billion). If a CSD wishes to provide banking-type ancillary services above the threshold, a limited-scope banking licence is needed (either for the CSD itself or for an associated bank which provides the services). No credit institution has yet become authorised for banking-type ancillary services, although it is early in the lifetime of the CSDR to know if that situation will persist. Further, CSDs which are not authorised to provide banking-type ancillary services may be constrained in their ability to provide DvP settlement²⁰⁸ or withholding tax services across a CSD link (outside T2S).
- e. There is also concern from some market representatives as to the possible impact of the settlement discipline regime described in article 7 of the CSDR on market liquidity. For example, the ICMA Impact Study for CSDR Mandatory Buy-ins published in February 2015 provides empirical evidence on the likely impact of CSDR settlement discipline rules on market liquidity and efficiency. The report states, for instance, that the *“EUR 5.5 trillion European repo market will (...) be radically re-shaped, driving more reliance on very short-dated repo funding (‘exempt’ repo), while the more stable, fixed-term repo markets will see dramatic widening of spreads for more liquid securities, and a total withdrawal of liquidity for less liquid securities, including some sovereign and public bonds, and most corporate bonds”*²⁰⁹.

7.4. Legislation not targeted at, but relevant to, post-trade

The three items of legislation just described (SFD, EMIR, CSDR) are those whose primary legislative purpose is the regulation and protection of the post-trade sector, and have a focus on infrastructures. Several other items of EU legislation, albeit not primarily focused on post-trade, have major components addressed to the post-trade sector; these are described in the following paragraphs.

7.4.1. Financial Collateral Directive

The *Financial Collateral Directive* (FCD) is a well-established measure which simplifies and creates certainty around collateral arrangements involving cash, financial instruments and credit claims (primarily of use for monetary operations of central banks). Significant diversity remains as regards implementation by Member States and difficult interpretation questions persist, as

²⁰⁷ Recital (26).

²⁰⁸ See Turing, D, *Clearing and Settlement*, 2nd ed (October 2016), section 15.49 for technical explanation.

²⁰⁹ http://www.icmagroup.org/assets/documents/Regulatory/Secondary-markets/CSDR-Settlement-Regulation/ICMA--CSDR-Mandatory-Buy-ins-Impact-Study_Final-240215.pdf

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discussed below, even though the basic idea of removing formalities for the use of certain securities financing transactions and, importantly, the creation and enforcement of certain security interests has largely been achieved across Member States, as has the objective of recognition of the 'title transfer' technique for taking collateral. The FCD also aims at the recognition of close-out netting provisions. Furthermore, qualifying financial collateral arrangements are exempt from some of the challenges arising in insolvency and resolution (such as moratorium on enforcement in reorganisation measures). The financial collateral regime provides an important contribution to the post-trade landscape by enabling effective collateralised liquidity management, enabling credit to be granted and facilitating the flow of collateral.

7.4.1.1. Other collateral legislation

Several further items of EU legislation have effects in relation to collateral, which may be mentioned here.

- a. EMIR requires that cleared transactions, and uncleared OTC derivatives, be collateralised. Further, EMIR obliges clearing members to pass up excess collateral received from a client who has chosen an individually segregated account to be held at the CCP. CCPs are obliged to hold non-cash collateral at 'securities settlement systems' where available, but may include a right of use of collateral in their rules.
- b. UCITS V prohibits the re-use by a depositary or any third party with custody of the fund's assets, and the prohibition includes 'transferring, pledging, selling and lending'.
- c. MiFID2 prohibits the entry into title transfer collateral arrangements with retail clients. The Commission Delegated Directive of 7 April 2016²¹⁰ introduces limits on the existence of security interests over client financial instruments held by an investment firm with a third party.
- d. WUD (Winding up Directive) allows the enforcement of 'rights in rem' (which would include a security interest) in respect of assets situated within the territory of a Member State which is not the Member State of the bank's or investment firm's head office, notwithstanding the opening of insolvency proceedings or reorganisation measures.
- e. The BRRD allows the resolution authority to impose a short-term stay on enforcement of security during the implementation of resolution measures. Resolution measures are treated as 'reorganisation measures' for the purposes of WUD, SFD and FCD. BRRD also allows a short-term stay on the exercise of termination rights (which would preclude the enforcement of title transfer collateral arrangements), though this does not apply to infrastructures such as CCPs and CSDs. (In consequence, a mismatch may arise upon the default of a clearing member, where the CCP has taken action at once but the clearing member's client is obliged to wait.)
- f. The SFTR imposes consent and risk-disclosure requirements vis-à-vis clients in respect of title transfer collateral arrangements and rights of use in connection with security financial collateral arrangements.
- g. The CRR recognises collateral to be risk-reducing for the purposes of some prudential measures but not others. In relation to the liquidity tests, the treatment of collateral granted and collateral received substantially affects the requirements for liquidity coverage and stable funding. Also the special rule²¹¹ allowing banks and investment firms to 'look through' their clearing member in respect of cleared derivatives business, as they are taking risk in economic terms on the CCP rather than the clearing member,

²¹⁰ C(2016)2031.

²¹¹ Article 305. See also section 7.4.9.1(d) below.

refers ambiguously to the ‘law governing the collateral’, which is open to various interpretations.

- h. AIFMD/UCITS V: Where perfection of a security interest under relevant national law requires that “control” be vested in the collateral taker, the depositary as a consequence will have given up control, which it is required to retain under AIFMD and UCITS V. If the depositary instead is understood to retain “control”, the requisites of perfection under national law may be open to question.

7.4.1.2. Transposition and interpretation of FCD

Various issues have arisen with differences in transposition and interpretation of the FCD between Member States. The most significant of these appear to be:

- a. Scope issues, with differences in relation to the parties eligible to participate in a protected financial collateral arrangement, the assets which may be treated as ‘financial collateral’, and the ‘relevant financial obligations’ which may be collateralised²¹².
- b. Absence of legal certainty as to the acquisition of collateral ownership rights (i.e. priority of interests and good faith acquisition). Member States are not currently obliged to have legal rules which recognise collateral acquired in another Member State by credit/debit of an account, earmarking, conclusion of a control arrangement or conclusion of an agreement in favour of the account provider.
- c. Additional checks, where in some Member States there remain additional steps or formalities to take in order to obtain a fully effective collateral arrangement in relation to non-marketable assets (such as loan claims²¹³). Further, up-to-date legal opinions concerning the processes for pledging debt securities in 19 Member States reveal that 5 Member States retain ‘perfection’ requirements, and a further 14 Member States have abolished ‘perfection’ requirements only in relation to purely domestic transactions (ie those requirements still apply where the collateral is non-local or the counterparty is non-local, and in two such Member States the requirements are regarded as a significant challenge²¹⁴).
- d. ‘Providing’ the collateral in relation to non-marketable collateral, where in some Member States it is not certain what steps need to be taken to ensure that the collateral-taker has ‘possession or control’ of collateral²¹⁵.

7.4.1.3. Challenges with respect to ‘re-use’

A further topic arising in relation to the interpretation of the FCD relates to the ability of a collateral-taker to ‘use’ or ‘re-use’ for its own account any securities collateral which it has taken under a security interest. This right was contemplated in respect of financial collateral arrangements between qualifying parties in the FCD, but more recent legislation has in some respects constrained the ability of parties to enter into arrangements which involve rights of use. The following observations can be made:

²¹² As to the diverging implementation of the FCD across EU Member States see *Evaluation report on the Financial Collateral Arrangements Directive* (December 2006) COM(2006)833 final. http://ec.europa.eu/internal_market/financial-markets/docs/collateral/fcd_report_en.pdf

²¹³ See the European Commission Report to the Council and Parliament of 29 June 2016, COM(2016) 430 final.

²¹⁴ Data obtained from CS Analytics service, October 2016.

²¹⁵ Cf (United Kingdom) *Gray v G-T-P Group* [2010] All ER (D) 90; *Re Lehman Brothers* [2012] EWHC 2997 (Ch); also *Private Equity Insurance Group SIA v Swedbank AS* ECJ Case C-156/15, awaiting judgment.

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- In some Member States it is not clear that once exercised, a right of re-use has the same effect as a title transfer collateral arrangement; the outcome is that the collateral provider can assert that it retains a property right in the collateral even though the collateral has been transferred (with apparently clean title) to a good-faith purchaser. (See case study below²¹⁶).

Uncertainty about the treatment of rehypothecated/re-used assets in case of bankruptcy of the collateral taker. The collateral provider has an unsecured claim, but in some jurisdictions where the collateral provider has a set-off right this is economically similar to a collateral arrangement without a right of use. However, this is not assured in all jurisdictions as set-off rights in insolvency are by no means universal.

- Furthermore, the definitions of rights of re-use are not identical across EU legislation, which adds complexity to the problem²¹⁷.
- Uncertainty may exist as to the extent to which clients' assets have been re-hypothecated: there are differing consent requirements under different EU legal acts, and differing restrictions in relation to title transfer collateral arrangements (which are economically equivalent to the right of re-use)²¹⁸.

7.4.1.4. Further commentary on FCD

The following additional comments may be made with regard to the FCD.

- a. The FCD leaves open to question an important case, commonly encountered in post-trade collateral arrangements. This is the situation where a financial intermediary, such as a clearing member or a custodian providing settlement services, receives securities from its client into an account provided by the intermediary. In this simple case, how the FCD works when the intermediary wishes to take a security interest over the securities it holds is unclear. The FCD states that the relevant legal system is that of the 'relevant account', but the tests for determining which is the relevant account can lead to two answers: the accounts on the intermediary's books, or the account where the intermediary's entitlement to the securities is recorded (such as the CSD)²¹⁹.
- b. The FCD does not unambiguously characterise the claim which a clearing member has against a CCP (or the claim which a client has against a clearing member) as 'financial collateral'²²⁰. The result is that national law obstacles to the creation of security interests persist in relation to such claims, whereas for the purposes of client (or indirect client) protection in a clearing context it is frequently desirable to facilitate the transfer of such claims under a security interest²²¹.
- c. The FCD protects close-out netting, but (like the SFD) cannot be said to provide a comprehensive 'netting law' consistent with the Unidroit Principles on Close-out Netting Provisions²²².

²¹⁶ Cf (United Kingdom/Belgium) *Habib Bank AG v Citibank NA* [2010] EWHC 3596 (Ch).

²¹⁷ FCD, art. 2(1)(m); UCITS V, art 22(7); SFTR, art 3(12).

²¹⁸ see MiFID II (Article 16(8)-(10)) and MiFID II delegated directive of 7.4.2016 (Articles 5 and 6).

²¹⁹ Cf Member States' divergence on renvoi issues: see *Conflict Of Laws Issues In T2S Markets: A Fact Finding Exercise*, p. 6 ff. http://www.ecb.europa.eu/paym/t2s/progress/pdf/ag/mtg29/item_4_20151116.pdf

²²⁰ Cf definitions in arts 1(4), 2(1)(d), 2(1)(e), 2(1)(o).

²²¹ Cf section 7.3.2.1. above.

²²² <http://www.unidroit.org/instruments/capital-markets/netting> ; cf section 7.3.1 above and Table R.

Case study

Example of good-faith purchaser being challenged

Securities Owner A transferred eurobonds to Repo Counterparty B under standard repo market documentation. The securities were in A's account in Euroclear Bank (Belgium) and were transferred to B's account in Euroclear Bank. B subsequently disposed of the securities to C outright. The securities were credited to C's account with a custodian in the UK.

Because B (which was a Lehman entity) was bankrupt and did not pay the repurchase price, A attempted to recover the securities instead, despite the 'title transfer' model of repo transactions. A wished to begin proceedings in England, on the ground that clean title can only be obtained in England if the acquirer (C) had 'legal' ownership of the securities, which is not possible in an intermediated chain. The English court decided that A's case was hopeless; the securities had been transferred under Belgian law and a clean title transfer had happened in Belgium.

7.4.2. MiFID and MiFIR

MiFID2/MiFIR are primarily concerned with the regulation of investment firms and trading. However, notwithstanding that custody remains an 'ancillary' service under MiFID2, they have substantial contributions in relation to post-trade matters as they relate to investment firms with authority or power to control disposition of client assets and client money or process client transactions. These include:

- a. Reporting of transactions to national regulators and publication of information concerning transactions for price transparency purposes²²³.
- b. Granting of access rights from one type of infrastructure to another in order to facilitate access to trading, clearing and settlement systems in other Member States²²⁴.
- c. Setting down a minimum standard for investment firms in safeguarding clients' money and financial instruments (including asset segregation obligations)²²⁵.
- d. Widening 'indirect clearing' regulation to exchange-traded derivatives markets²²⁶.
- e. Prohibiting taking of collateral by way of title transfer arrangement with retail clients²²⁷.
- f. Implementing rules and procedures for straight-through processing of exchange-traded derivatives²²⁸.

The new MiFID2 and MiFIR regimes are also awaiting Regulatory Technical Standards and Commission Delegated Acts and it is too early to make critical judgments, particularly in relation to indirect clearing where the way forward is not settled. However, the existing MiFID²²⁹ and its implementing measures contain similar standards albeit with less detail and narrower scope.

The following comment may be made concerning MiFIR. Indirect clearing arrangements have been said to be difficult to implement, in part owing to the risk of insolvency challenge. It is argued that firms may be unable to offer the service, contrary to the policy objectives of maximising the clearing

²²³ For details, see Table P.

²²⁴ MiFID2, arts 37, 38, 55; MiFIR, arts 35, 36.

²²⁵ MiFID2, art 16 and Commission Delegated Regulation [C(2016)2031].

²²⁶ MiFIR, art 30.

²²⁷ MiFID2, art 16(10).

²²⁸ MiFIR, art 29 and [RTS C(2016)3944].

²²⁹ Directive 2004/39/EC of the European Parliament and of the Council of 21 April 2004 on markets in financial instruments and amending Council Directives 85/611/EEC and 93/6/EEC and Directive 2000/12/EC of the European Parliament and of the Council and repealing Council Directive 93/22/EEC.

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of derivative financial instruments²³⁰. It is not clear that the provisions of MiFIR or secondary legislation under it²³¹ will alleviate that concern.

7.4.3. Securities Financing Transaction Regulation

The *Securities Financing Transaction Regulation* (SFTR) extends the TR reporting regime introduced under EMIR (for derivatives) to ‘securities financing transactions’. It also introduces a regulatory standard increasing disclosure to investors by managers of funds using such transactions and exercising rights of use over collateral securities. Detailed Regulatory Technical Standards on the reporting aspects of the SFTR are in development. Furthermore, the SFTR sets conditions for the re-use of collateral, particularly the prior consent of the collateral provider, a disclosure of risks, and the debiting of the collateral provider’s account.

The following comment may be made concerning the SFTR. It appears that credit granted by settlement agents (incidental overdrafts in connection with settlement of securities purchases) appears to fall within the definition of ‘margin lending’, i.e. a species of securities financing transaction giving rise to a reporting obligation under Article 4(7) of SFTR: this is because ‘margin lending’ is defined²³² as ‘a transaction in which a counterparty extends credit in connection with the purchase, sale, carrying or trading of securities’, so unless a settlement agent cannot be regarded as a ‘counterparty’ the loan would appear to be in-scope.

7.4.4. AIFMD and UCITS

AIFMD/UCITS V include rules relating to depositaries of funds. These are not primarily post-trade measures, but impose duties on depositaries which include restitution obligations and asset segregation obligations. Asset segregation can be imposed along a holding chain: where safekeeping has been delegated, the third party must keep records to enable it to distinguish assets of AIFs from its own assets, assets of its other clients, the depositary’s own assets and the depositary’s non-AIF clients²³³; similar obligations arise in relation to retail collective investment schemes under UCITS V. Both regimes impose obligations on depositaries to safekeep all assets of the fund and to monitor cash. Unlike other EU legislation, AIFMD and UCITS V impose restitution liability on depositaries in no-fault scenarios, such as where a fund manager on behalf of an investment fund enters into a collateral arrangement with a third-party, or a collateral agent, in order to support trading or financing arrangements.

7.4.5. Shareholders Rights Directive

The *Shareholders’ Rights Directive* (SRD) is designed to enable shareholders to enjoy and exercise rights which flow from their investment.

The following remarks may be made with regard to the SRD:

²³⁰ Cf <https://fimag.fia.org/issues/2014-11/is-there-a-future-for-indirect-clearing>

²³¹ ESMA proposed RTS ESMA/2016/725.

²³² Article 3(10).

²³³ Commission Delegated Regulation (EU) No 231/2013, art 99.

- a. The original SRD did not deal with the facilitation of exercise of shareholders' rights cross-border. It (like the Transparency Directive²³⁴) also left the definition of 'shareholder' to national laws, which have very different approaches to the question. In some Member States it may not be possible to recognise a person who holds financial instruments 'indirectly' to be a shareholder²³⁵. This may have the effect that an end investor is not regarded as a "shareholder" by the company if certain legal requirements of applicable company law have not been complied with. This is witnessed particularly when an end investor holds its shares using a cross-border chain of intermediaries. This issue will not be addressed by the proposed revision of the SRD.
- b. The identification by issuers of 'shareholders' across borders for the purposes of the directive has been challenging, and in a chain of holdings there is uncertainty as to who bears the responsibility for delivering the objectives of the legislation. This issue should be addressed by the proposed revision of the SRD.
- c. Shareholders have difficulties in confirming how intermediaries executed their voting rights on their behalf. The SRD revision (see section 7.5) addresses this issue to some extent; however, it is still unclear if intermediaries will always be required to confirm the votes cast.
- d. The essential elements of the benefits of a security which an end-investor seeks to enjoy comprise all shareholders' rights (e.g. being informed about general meetings, being able to participate in general meetings, to enjoy monetary rights like receiving dividends, pre-emption rights, participating in corporate events like capital increases, mergers, spin-offs etc.). Facilitating the exercise of those rights as created under the law applicable to the security is currently not regulated on a European level, and cross-border investors may encounter difficulties for example in the exercise of voting rights on the same terms as domestic investors. This issue will not be fully addressed by the proposed revision of the SRD, but a non-legislative solution may assist. Under a joint initiative of the European Commission, the ECB, ESMA and others, pan-European industry associations have endorsed documents setting European market standards for processing of both corporate actions and general meetings. Full adherence to the standards by all relevant parties (including issuers and infrastructures) would significantly improve the ability of investors to exercise their rights, although compliance with the standards is still patchy.

Finally, it should be noted that the revision of the SRD is commented on in section 7.5. below.

7.4.6. Bank Recovery and Resolution Directive

The *Bank Recovery and Resolution Directive* (BRRD) provides EU resolution authorities with a toolkit of powers for use on distressed financial institutions. The BRRD will affect the management of counterparty risk by firms providing clearing and settlement services to other financial firms, by introducing the possibility of bail-in of cash and other obligations (such as indemnity obligations), and by introducing a two-day stay on termination, netting and collateral rights. The BRRD will also lead to recovery plans and resolution plans being prepared for firms.

²³⁴ Directive 2004/109/EC of the European Parliament and of the Council of 15 December 2004 on the harmonisation of transparency requirements in relation to information about issuers whose securities are admitted to trading on a regulated market and amending Directive 2001/34/EC.

²³⁵ Cf Paper by Karin Wallin-Norman for the Legal Certainty Group, *Legal Certainty over the Nordic securities holding systems* (2005), http://ec.europa.eu/finance/financial-markets/docs/certainty/background/21_4_5_wallion-norman_en.pdf

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The following comments may be made with regard to the BRRD:

- a. Various provisions of BRRD protect infrastructures but not the providers of access to infrastructures. For example, while Article 44(2) excludes from bail-in sums owed to operators of designated systems (which would include CCPs and CSDs) the provision does not help clearing members or settlement agents (providing access to the infrastructure) in the case of resolution of their clients. Again, looking at the possible resolution of clients of settlement agents, indemnity obligations of such clients may also be bailed in. Indemnities may be an important component of post-trade service providers' risk protection armoury.
- b. Deposits made in the context of custody services, which may be critical to the functioning of the financial markets, are subject to bail-in in the event of resolution of the bank providing the service.

7.4.7. Winding up Directive

The *Winding up Directive* (WUD) controls the exercise of insolvency jurisdiction over credit institutions and investment firms. Its relevance to the post-trade sector is limited but it contains important rules which are relevant to the management of risk by market participants:

- a. Proprietary rights (*'rights in rem'*) are enforceable, notwithstanding insolvency proceedings or reorganisation measures, if the asset in question is located in a Member State other than the head office Member State²³⁶. This enhances the enforceability of security financial collateral arrangements in a cross-border context.
- b. Netting and repurchase agreements are deemed to be governed solely by the law of the contract governing the agreement²³⁷. This enables market participants to choose a legal system for their contract which ensures the effectiveness of netting and repos. Another rule relating to set-off rights²³⁸ has a similar effect.
- c. A further choice-of-law rule relates to 'transactions carried out in the context of a regulated market' and again states that they are to be governed solely by the law of the contract governing the transactions²³⁹. The scope of this provision is, however, uncertain, in particular as to whether it applies to post-trade processing of the transactions or is limited to the existence (or otherwise) of a transaction, and the rules of the applicable market.

7.4.8. Anti Money Laundering Directive

The *Anti-Money-Laundering Directive* (AML4) requires certain financial institutions and other entities to develop controls and carry out customer due diligence, with a view to prevention of money-laundering and terrorist financing. In relation to the post-trade sector, the following features may be noted:

- a. Custodians and providers of post-trade transaction services are (as banks or investment firms) subject to the obligations of AML4. However, financial market infrastructures are not specifically required to comply, unless they are authorised as credit institutions or investment firms or they carry out certain specified financial activities (CSDs, for

²³⁶ Article 21.

²³⁷ Articles 25, 26.

²³⁸ Article 23.

²³⁹ Article 27.

instance, may be subject to AML requirements if they are responsible for maintaining a registry of beneficial ownership or if they act as account operators)²⁴⁰. Since not all infrastructures will fit this description, this potentially leaves the playing-field somewhat uneven.

- b. In order to identify the 'beneficial owner' of a customer it may be necessary to trace a chain of ownership through a chain of holdings of securities²⁴¹. Beneficial ownership information on EU corporate entities is to be held in central registers²⁴². There may therefore be overlap with the policy objectives of the SRD²⁴³, even if the SRD can be criticised for not addressing the point.
- c. It is a requirement that financial services providers report suspicious transactions to the applicable financial intelligence unit²⁴⁴, and financial institutions may be instructed not to carry out suspect transactions²⁴⁵.

7.4.9. Capital Requirements Regulation

The *Capital Requirements Regulation* (CRR) implements the Basel III framework for prudential regulation of credit institutions and investment firms within the EU. Providers of post-trade services which are banks or investment firms are treated for each prudential measure in the same way as if they were conducting ordinary lending or trading activity, which has led to some criticism as to whether the prudential measures operate too indiscriminately in respect of such services (which ought not to be inherently risk-taking as compared with lending or trading).

7.4.9.1. Impact of CRR on post-trade

The following aspects of the CRR may be identified as potentially inhibiting post-trade activity:

- a. The leverage ratio requirements operate without regard to the arguably special position of banks providing custody, clearing, cash management, payment, and settlement services because they place large deposits with central banks. Custodian banks receive client cash deposits as a by-product of these services (e.g., clients leave cash with the bank to facilitate payments). The custodian bank generally places this cash at central banks or invests it in low risk, highly liquid assets. Custodian banks must hold a large amount of equity capital for these central bank placements even though such placements cannot be arbitrated or used to leverage other transactions.
- b. The leverage ratio requirements apply without regard to the arguably special position of banks and investment firms providing clearing member services because they do not allow an offset for back-to-back transactions or for margin. The clearing member will have a contract with its client which matches exactly (but is opposite in sense to) a contract it has with the CCP. Although the economic effect of these identical but opposite contracts is nil, because they cancel each other out, they are treated as separate for leverage ratio purposes. The same point applies to margin as to positions.

(In both these cases the position may be contrasted with large exposures rules which have relevant derogations.) It may be noted that the Basel Committee may consider further revisions to the leverage ratio rules in due course, which may lead to revision of the CRR.

²⁴⁰ Article 2.

²⁴¹ Article 3(6).

²⁴² Article 30.

²⁴³ Cf para [39(c)] above.

²⁴⁴ Article 33.

²⁴⁵ Article 35.

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- c. The net stable funding requirements apply without regard to the arguably special position of banks providing clearing or settlement services. While client assets attract a stable funding requirement, there is no recognition of the stable funding attributable to the corresponding client payables.
- d. The criteria in Article 305 of the CRR for reduced risk-weighting for indirectly cleared derivatives appear burdensome and impractical. The relevant Basel III rules²⁴⁶ are less detailed and simpler to understand. Criticisms of Article 305 include: (i) the types of loss which have to be avoided are spelt out in the Basel rules but not in the CRR; (ii) the Basel rules require only a legal review, not a formal legal opinion; (iii) certain of the jurisdictions from which the CRR legal opinions must be obtained may be irrelevant to the risk to be assessed; (iv) the CRR does not allow favourable treatment where the CCP is not an EU CCP; (v) the Basel rule requires only that the client transactions be 'highly likely to continue to be transacted through the CCP' whereas the CRR standard is higher. Other difficulties of interpretation of CRR and disparity with the Basel standard could be added.
- e. Netting of repo transactions for the purposes of leverage ratio calculations is conditional on the intention of the parties to settle net, settle simultaneously, or the transactions being subject to a settlement mechanism where, on the settlement date, the cash flows of the transactions net to a single net amount. Where the risk is managed through a close-out mechanism as in market standard repo documentation the leverage is much more limited than under the 'intention to settle' test, since maturity dates do not have to be the same to achieve the benefits of close-out netting.
- f. It may also be noted that the treatment of exposures to CCPs in respect of default fund contributions under CRR²⁴⁷ differs from the Basel III standard²⁴⁸. The rules for default funds at cash-equities CCPs are markedly different from those for derivatives CCPs.

Finally, it may be noted that revisions to the CRR are being planned, which may address some of the concerns noted in this discussion.

7.5. Work in progress

Various developments which are still in the pipeline may be mentioned.

The amendments the SRD may enable European end investors to exercise their rights more fully. This has recently completed in the legislative process²⁴⁹. The following remarks may be made relative to the final form of the amended SRD.

- The exercise of shareholders' rights across borders or along chains of intermediaries, which is currently not regulated on a European level. The final form of SRD2 should substantially address this.
- The current form of the SRD allows Member States to determine who is a 'shareholder', and in particular to exclude from the category of shareholders any person whose name does not directly appear on the shareholders' register. Again, the final form of SRD2 should ensure

²⁴⁶ BCBS 282, para 197: see www.bis.org/publ/bcbs282.pdf

²⁴⁷ Article 308 and art 520 (amending EMIR).

²⁴⁸ BCBS 282, para 204.

²⁴⁹ The revised Shareholders Rights Directive (SRD2) was agreed by the European Parliament and the Council in March 2017 but at the time of issue of this Report had not been published in the Official Journal of the EU. The text of SRD2 which the EPTF has used to compile this Report is document number PE-CONS 2/17 dated 23 March 2017 located at <http://data.consilium.europa.eu/doc/document/PE-2-2017-INIT/en/pdf>, and the article numbers referred to in this Report are taken from that version.

that anyone who is an investor is regarded as a 'shareholder', even if the investor holds shares via a chain of intermediaries.

- Some national specificities relating to registration of shareholders will remain in place, and as a directive the process of national transposition may perpetuate or introduce national specificities, with implications for the issues noted above.

A proposal to amend AML4 is in the legislative process²⁵⁰.

Finally, mention should be made of the intention of the EU to introduce legislation for the recovery and resolution of central counterparties²⁵¹. At international level, in October 2014 the Committee on Payments and Market Infrastructures and the International Organization of Securities Commissions (CPMI/IOSCO) published a report on Recovery of financial market infrastructures, followed by a consultation on further guidance in August 2016²⁵². In October 2014, the Financial Stability Board published Key Attributes of Effective Resolution Regimes for Financial Institutions containing in Appendix II, Annex 1, guidance on resolution regimes for systemically important FMIs, and in August 2016 the FSB published a further discussion paper on aspects of CCP resolution planning²⁵³. When fully developed, the CPMI/IOSCO and FSB proposals are expected to be adopted in Europe.

7.6. Conclusions on existing EU legislation

From the above overview, the following conclusions may be drawn:

- a. For almost every one of the market activities described in preceding chapters related to securities and derivatives, e.g. issuance, trading, clearing, settlement, etc., there is at least one EU legislative instrument of which the primary policy objective is to regulate that activity. The same is true in relation to funds and liquidity tools. In other words, the post-trade sector is already very thoroughly catered for in terms of legislation and indeed regulation, albeit that the policy approach to legislation has not been to address each of the activities systematically one-by-one.
- b. Very little of the legislation is completely comprehensive in its coverage of the post-trade sector, in that each item of legislation tends to pick out a few policy areas of concern, which are addressed in detail. Exceptions to that general observation are EMIR and the CSDR, which introduce comprehensive regulatory regimes for operators of post-trade market infrastructures. (This observation should not be taken to imply that every activity or market practice *needs* to have accompanying legislation).
- c. The few gaps which there are concern: (i) issuance and issuer services, for which the Shareholders' Rights Directive is relevant although not a comprehensive regulatory instrument; and (ii) asset servicing, for which provision has been made in relation to assets held by investment funds and investment firms.
- d. In parts of post-trade regulation, harmonisation is missing and unclear, conflicting or inconsistent requirements may make implementation rather cumbersome. Differences in national interpretation and implementation have led to gaps in coverage.

²⁵⁰ Cf COM(2016) 450 final.

²⁵¹ EU consultation ended in December 2012. CPMI recommendations are also in the pipeline.

²⁵² <http://www.bis.org/cpmi/publ/d121.htm> ; <http://www.iosco.org/library/pubdocs/pdf/IOSCOPD539.pdf>

²⁵³ http://www.fsb.org/wp-content/uploads/r_141015.pdf ; <http://www.fsb.org/wp-content/uploads/Essential-Aspects-of-CCP-Resolution-Planning.pdf>

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7. Legislative and regulatory framework

Very little of the legislation analysed is designed with the primary purpose of directly facilitating an activity in the sense of eliminating barriers²⁵⁴; instead it is designed to limit abuses or to require business to be done in a particular way (in other words it is 'regulatory' in nature). Notable exceptions to that general observation are: (i) the SFD, the principal objective of which is neither regulatory nor facilitative, but to provide insolvency-protection to post-trade infrastructures and their participants; and (ii) the FCD, which facilitates the use of financial collateral as credit support. The CSDR may be mentioned as a measure which, although primarily directed at regulation of CSDs, has harmonised various market practices regarding securities settlement and thereby lowered or eliminated numerous Giovannini barriers²⁵⁵. Another important exception is the T2S which, while not constituting 'legislation' as such, can be said to have eliminated some operational barriers and has facilitated EU and national legislation in certain important areas where it has impact, e.g. settlement cycles, finality, corporate actions.

²⁵⁴ Of course all legislation achieves a degree of improvement by creating predictability and certainty in the area of its competence.

²⁵⁵ Cf ECB summary at <https://www.ecb.europa.eu/paym/t2s/about/html/giovannini.en.html>

8. Implications of distributed ledger and blockchain technology

Finally, mention should be made of the emergent distributed ledger technology and the way it may fit into the existing legal and regulatory environment. This technology has the potential to change the market organisation with new players appearing and other potentially disintermediated. This poses regulatory challenges with regard to investor protection, financial stability and market integrity.

Distributed ledger and blockchain technology poses legal, regulatory, technical and functional challenges to the financial industry in general and the post-trading sector more specifically. Actually, any post-trade services based on these technologies necessitate an implementation that adequately mitigates settlement, custody and related risks (for instance, assuring the integrity of an issue or provides a satisfactory degree of cyber resilience).

The introduction of the DLT may give rise to new infrastructure-type services being provided either by existing or by new providers (e.g. identity management, determination and maintenance of DLT platform protocols). Existing legal or regulatory rules may therefore be insufficient to deal with such new roles.

8.1. Distributed ledgers

A distributed ledger is a *shared* record of either transactions or account balances for a given set of assets (i.e. cash or securities) and their holders. The main novelty distributed ledger technology (DLT) might be able to deliver to financial markets is that account holders could modify their records (e.g. securities or cash balances) and such update would be reflected in the shared distributed ledger. That could happen either with or without a trusted central governance of the system and yet each user may consider the state of the ledger as authoritative. Security in a distributed ledger builds on standard asymmetric-key cryptography²⁵⁶ to ensure validation rules prevent any illegitimate update of the ledger. The possibility that future databases might avoid the management and reconciliation costs of separated central validation systems might induce financial intermediaries to embrace DLTs in an effort to lower back-office costs and possibly collateral requirements.

From a participation point of view, there are restricted and unrestricted distributed ledgers. In *unrestricted* distributed ledgers – i.e. ledgers that can be accessed by any entity – consensus algorithms are in place to avoid that any individual participant (or coalitions of) can profitably tamper with the ledger. In the case of *restricted* distributed ledgers – i.e., ledgers where only a set of known entities is authorized to participate – the entities entrusted with granting access may act as enforcer for the application of regulatory and service rules.

DLTs can be broadly grouped into *blockchains* and *consensus ledgers* – each with its own model of security to ensure that incentives of validators are aligned to keep the ledger authoritative.

8.2. Blockchains

Blockchain technology allows a number of participants in a (restricted or unrestricted) peer-to-peer network to validate (blocks of) new transactions and append them to the chain of previously

²⁵⁶ Asymmetric-key cryptography allows the holder of a specific pair of private and public keys to: a) sign a message with private key to allow any network participant to check – by using the corresponding public key – that he was the author, and b) receive a message signed by network participants with his public key and be the only person able to read that message.

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8. Implications of distributed ledger and blockchain technology

validated (blocks of) transactions. The chain of validated blocks constitutes a *block-chain*, which is updated and broadcasted to all participants to ensure transparency and consistency of information²⁵⁷. Anybody who joins the network receives either the entire latest blockchain file or its *hash* – i.e. a string of data that is univocally linked to a specific version of the blockchain.

Transactions that wait for validation may be added as a new block to the previous blockchain only if they are considered legitimate by a specific set of validators in the network²⁵⁸. Validation rules are specific to different DLT implementations. When a new block of transactions is validated and added to the most recent version of the blockchain, it might either be considered final and irrevocable or not depending on what DLT specification is adopted. After a new block of valid transactions is added, the new blockchain hash is computed and it is broadcasted to all network participants. That allows originators of new transactions to include it in their validation requests, to provide a link with the most recent status of the ledger.

8.2.1. Restricted blockchains

The financial industry has developed over time as a network of mutually trusting institutions, with legal agreements and regulated procedures in central financial market infrastructures in order to ensure settlement efficiency and safety required by public authorities. Each institution trades with identifiable, accountable and authorised peers, under the supervision and oversight of public authorities who enforce a set of rules such as settlement finality, with a view to ensuring the safe and efficient functioning and thus the stability of financial markets. In a restricted model, a set of trusted participants can act as gate-keepers and provide identity management for possible end users. A risk management framework and governing rules in place that allow modifying the ledger or initiating reverse transactions in the case of illicit or erroneous transactions is closer to the concept of the restricted ledgers. That may make the restricted blockchains a more likely option to be considered among market participants.

Sub-ledgers with different validation methods cannot interact directly, but inter-ledger functionalities are under development to possibly allow future interoperability from the technical point of view.

8.2.2. Consensus ledgers

The approach taken by consensus ledger DLTs is, contrary to blockchain, more similar to traditional accounting and to systems currently used by financial market infrastructures: instead of keeping track of how each asset is transferred in the ledger and to what address/user it is registered at any block of the chain, consensus ledgers periodically update the balance (so called “state”) of each user’s account. Similarly to blockchain DLTs, consensus ledgers may be designed to work with or without a central authority – as opposed to database technology where a central validator (e.g. the registrar or a CSD) has to exist which has always special privileges – and they allow the execution of smart contracts.

²⁵⁷ In some DLT protocols, the blockchains held by different users can momentarily differ and are reconciled after some time.

²⁵⁸ To allow central control of some functions, a DLT could also allow certain types of transactions to be validated by a single entity.

8.2.3. Smart contracts

The smart contract functionality represents the transposition of conditional contractual obligations in the digital distributed ledger²⁵⁹. This can ensure the automatic execution of predefined actions – such as crediting a dividend/coupon payment or substituting collateral – which take place in the ledger when a specific event happens. Since smart contracts would be written in the ledger according to a defined protocol, their validation would follow a similar procedure to that of asset transfers. Hence, if a DLT were able to ensure validity of ledger updates, also execution of its smart contracts could be similarly protected from tampering. However, the systemic consequences of a smart contract cannot be neglected, since the code has direct and immediate impact on securities and cash accounts in the ledger as soon as an event triggers execution.

8.3. Possible impact on post-trade functions and regulation

8.3.1. Issuance and safekeeping

The issuance itself and all aspects linked to the issuance of securities as well as to the rights attached to securities are defined by national civil and corporate law, the “creation law” of the security in question. Further, there is (still) no harmonised regime for safekeeping and record-keeping of ownership of securities at EU-level, which may be performed by a wide range of entities such as custodian banks, registrars or CSDs.

8.3.1.1. Notary function and integrity of issue

Some key questions arise with DLTs as with any technology used in the issuance process: who is performing and guaranteeing the notary function, i.e. who is ensuring (and is liable) that the amount of securities held by investors is always identical to the amount issued by the issuer as currently performed by CSDs/issuer agents?

Securities accounts for the issuer and investors will need to be opened and managed in distributed ledger solutions. If based on consensus of participants, there could be wrong incentives in managing impartially the amount of securities in the DLT scheme and safeguard the integrity of the issue, which may call for a centralised actor or trusted entity (e.g. issuer agent, CSD etc.) to undertake the notary and reconciliation functions.

Likewise, the rules governing the recording-keeping of ownership at the investor level would have to be taken into account by a DLT scheme, necessitating the use of depositaries in the cases foreseen by AIFMD and UCITS.

8.3.1.2. Place of issuance

Any DLT based issuance would continue to need to comply with the applicable legal and regulatory framework. If there were a supportive applicable national or European framework, providing for an application built on DLT that would allow issuers to create their securities directly in the digital ledger along pre-determined formats. However, in a DLT environment, which by its nature is digitised and spread across different IT nodes, there may be uncertainties as to whether the ledger can be attributed to a particular legal entity or jurisdiction and thus about what the applicable law

²⁵⁹ There is some confusion caused by the term “contract”. Often discussants presume that “real” legal agreements are simply put in digital code to create the “smart contract”, whereas in fact it is just the automatized execution of certain actions in a STP business flow once certain parameters are being met.

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8. Implications of distributed ledger and blockchain technology

is. An additional complexity is derived from the question of legal qualification of the issued instrument as represented in in ledger (whereby the entry could be considered a mere accounting record or constitute proprietary rights or even contain the digital (tokenized) asset itself).

Leaving aside company law restrictions, would an issuer be able to issue securities under any legislation and independently of the issuers' location (as is possible from a technical perspective)? Further, at least regarding traditional financial instruments, other regulatory and legal barriers (e.g. withholding tax procedures) would still be applicable.

8.3.1.3. Shareholder transparency

Cross-border shareholder transparency might be facilitated through the adoption of DLT. However, for such benefits to materialise, investors in different markets would need to have their holdings registered in distributed ledgers using interoperable protocols, and issuers would need to be able to access these DLT schemes or obtain the investor specific data from them regardless of who controls access to data on individual accounts.

8.3.2. Trading

The impact of DLT on certain components of trading (e.g. trade enrichment, confirmation, and trade matching) would depend on whether and how trading platforms might interoperate with a distributed ledger. In case of interconnectivity between traditional trading platform and DLT based solutions, a number of typical back-office procedures between trade capture and the instruction of settlement might disappear if buy and sell orders sent to a DLT platform were themselves considered or used as settlement instructions.

8.3.3. Clearing

Different DLT models may have different technical specifications. However, they have the potential to significantly shorten settlement cycles to as little as few seconds. Such feature of DLTs possibly impacts on the clearing function, in particular spot transactions²⁶⁰.

8.3.3.1. Market liquidity

Whilst immediate settlement would reduce counterparty risk (assuming sufficient liquidity on securities and cash accounts), this might have an impact on market liquidity – since the benefit of netting would be lost – with possible adverse consequences on the price formation mechanism and on the ability of financial markets to absorb supply/demand shocks.

8.3.3.2. Collateral management and netting

In DLT models where settlement is not instantaneous and clearing might play a role during the settlement cycle period, smart contracts could possibly change the way collateral and netting are managed, e.g. by encoding smart contracts in the ledger, a CCP might make margin calls automatically executable in the accounts of its clearing members. Similarly smart contracts could be used to execute close-out netting automatically upon predefined events taking place, potentially leading to accelerated and simultaneous defaults across market participants and infrastructures.

²⁶⁰ For derivative transactions, the risk exposure would need to be hedged until execution of the contract.

8.3.3.3. Market access

If different DLT models were applied by different clusters of market participants/infrastructures, there will be issues of interoperability causing fragmentation. Adoption of a common DLT solution, or at least interoperable DLT protocols, across the financial market would solve interconnectivity issues from a purely technical perspective. Further, the possibility of technical interconnectivity could revive efforts towards interoperability. However, the persistence of regulatory and practical fragmentation might hamper any effort towards the development of common technical solutions. Whilst immediate settlement would reduce counterparty risk (assuming sufficient liquidity on securities and cash accounts), this might have an impact on market liquidity – since the benefit of netting would be lost – with possible adverse consequences on the price formation mechanism and on the ability of financial markets to absorb supply/demand shocks.

8.3.3.4. Current EU legal and regulatory environment

Pursuant to EMIR, certain types of standardised OTC derivative transactions are subject to a clearing obligation by CCPs and require certain risk mitigation techniques (e.g. bilateral margining) to be applied for non-centrally cleared OTC transactions. MiFIR extends the clearing obligation to regulated markets for exchanged-traded derivatives. According to EMIR, the central clearing currently needs to be performed by a legal entity (a CCP) interposing itself between the counterparties of a trade under a common rule book.

A DLT scheme²⁶¹ geared to provide central clearing functions would need to comply with existing EU regulatory requirements, in particular the need for an authorised legal entity acting as operator as well as other requirements (e.g. capital requirements, open-access rules, rules of conduct, segregation and portability or reporting to trade repositories). Similarly, a DLT scheme intended to be used for the bilateral clearing of OTC derivative transactions would have to be structured in such a way that it would allow parties to the trade to comply with applicable EMIR obligations such as risk mitigations techniques.

8.3.4. Settlement

8.3.4.1. Settlement cycles

The potential shortening of the settlement cycle through the application of DLT schemes could be a challenge in terms of liquidity, both for the cash and the securities leg. If settlement were to become (close to) instantaneous²⁶², existing cash and collateral management models may not be necessary any more since delivery vs. payment eliminates the need for collateral. Some ancillary DLT solutions are being developed to lower the impact of shorter settlement cycles on liquidity, e.g. by integrating in the ledger the possibility to arrange standing securities lending agreements with other users. Another alternative considered is to allow settlement to happen in batches in order to allow to synchronise liquidity in global financial markets.

²⁶¹ See also the comment in section 8.3.7. on additional complexity derived from the question of legal qualification of the instrument as represented in a ledger.

²⁶² “Instant settlement” should be differentiated from T+0.

8.3.4.2. Schedule for the settlement day

Some developers envisage 24/7 settlement on the distributed ledger. Although DLT would be able to avoid maintenance windows from a purely technological point of view, around the clock availability of settlement platforms could be impaired if a distributed ledger will need to interoperate with off-ledger entities or infrastructures running traditional central database technologies. The cash leg and DvP in particular is an issue. Cash might either have to be moved onto the distributed ledger, or it would need to be represented on it with some kind of escrow arrangement, or interoperability with RTGS systems would need to be established – unless the trading community would be allowed and willing to trust any virtual currency for the purpose of cash settlement.

8.3.4.3. Settlement finality

A central question is the application of settlement finality regimes in different implementations of DLT. In particular in fully decentralised schemes, who would define the relevant finality concepts (what constitutes a “transfer order”, moment of entry, moments of irrevocability and enforceability of transfer orders or transfer of assets, law governing the “system”, etc.)? And more fundamentally, who would agree on the “rules of the system” and would the DLT scheme be able to comply with the “designated system” concept of the SFD? Extension of the legal protections provided under the SFD (which are a precondition for legal certainty of settlement) to DLT schemes is likely to necessitate changes to the existing legal regimes.

8.3.4.4. Current EU legal and regulatory environment

The CSDR requires EU issuers of transferable securities admitted to trading or traded on trading venues to arrange for such securities to be represented in book-entry form. Whilst the CSDR gives flexibility on the way to ensure book-entry transferability, existing national laws may not recognise DLT ledgers as being suitable for this purpose. Furthermore, the CSDR requires the use of a CSD where a transaction in transferable securities takes place on a trading venue or when they transferred following a financial collateral arrangement.

Both CSDR and SFD contain formal requirements for securities settlement systems which a DLT would have to comply with (including the need to be operated by an authorised CSD). For instance, if a CSD were to implement a DLT solution under the current SFD regime, it would have to define the jurisdiction under which the distributed ledger would be legally operated. In addition, the CSDR establishes minimum capital requirements, conduct of business rules and risk management requirements (e.g. the monitoring of settlement fails and procedures to resolve fails), independently of the technology used in the CSD’s settlement engine.

Alternatively, according to the CSDR, settlement could be executed by so-called settlement internalisers. A DLT scheme acting as settlement internaliser would have to comply with the CSDR reporting requirements and would need to obtain direct or indirect access to a CSD. In such a case, the DLT would be offering a custody service (i.e. it would be holding assets on behalf of clients, would be providing securities accounts, etc). It would have to be a legal entity that is allowed to provide such services. Unless it qualifies as either of these concepts, a DLT would only be able to settle securities transactions that do not fall under the scope of CSDR.

8.3.5. Asset Servicing

There may be technical issues of concurrency and reconciliation among updates in the ledger. For instance, when a smart contract is being executed, it may modify any account it has access to. Settlement (i.e. transaction updates) might consequently be affected by the execution of a smart contract that triggers a change in the ledger between an update request and its validation.

Another more general consideration is the need to obtain clarity on the legal nature and effect of such “smart contracts” (since they are automated processes integrated in the DLT protocol) and their interaction with (or the absence of) validly executed legal agreements between the relevant counterparties behind the automated algorithms as well as liability issues.

8.3.6. Reporting

The use of “smart contracts” has the potential to facilitate the fulfilment of reporting obligations in an automated manner if it were integrated to a DLT scheme providing trading, clearing or settlement functions. However, the constitution of a DLT scheme as trade repository would necessitate compliance with EMIR, in particular operational, record-keeping and data-managements requirements thereunder.

8.3.7. Other legal and regulatory issues

Irrespective of technical and operational aspects, fundamental legal issues remain to be resolved to create the degree of legal certainty necessary to support a safe and efficient functioning of financial markets relying on the use of DLT. Issues to be resolved include *inter alia* legal certainty and clarity on:

- the nature of assets represented in digital form on a distributed ledger,
- the legal status of the ledger (platform), its governance and the “rules of system”,
- the legality and enforceability of the records kept on the DLT (including the attribution of “public trust”),
- the authentication of DLT users/parties to a transaction (e.g. to prevent access by unauthorized market participants or minors),
- responsibilities for ensuring compliance with regulatory requirements such as AML or tax reporting,
- the rights and obligations of the parties to a transaction executed through entries on a DLT or blockchain,
- who is liable for operational vulnerabilities (cyber resilience, protocol control, etc.), fraud or theft,
- who is responsible for investor protection, data secrecy and privacy rules.

Furthermore, the recourse on functions that require discretion or judgement (e.g. to correct/cancel/adjust transactions, to reverse a transaction based on contractual right or to declare a default) may be impaired or even become impossible through the automatized and irreversible execution in blockchains and smart contracts.

Current differences in securities and corporate laws across the EU may further enhance the complexity of a wide deployment of the new technology in the EU post-trade domain. New technology and its wide deployment in the European post-trade domain may help to overcome current operational problems in the application of securities and corporate laws across Europe.

Preliminary conclusions on DLT

Coordination vs fragmentation: DLT models vary greatly in terms of technical and functional specifications and standards. If market participants were to adopt them in a non-coordinated way, this would lead to fragmentation rather than standardisation and harmonisation in post-trade services which should be avoided. In case coordination and agreement were to be found over a potential adoption of a particular DLT implementation, the details of such technology could affect the past and ongoing harmonisation undertaken.

Timing of implementation: DLT is expected to be a gradual and iterative process (which is also a reason of potential fragmentation). Its adoption on a large scale in securities markets may take years, but the adoption process should be accompanied by regulators and legislators to avoid that a potential improvements to efficiency turn into new barriers needing further activities to achieve ex-post harmonisation. This would call for monitoring developments very closely.

Open questions remain both from the regulatory side and from the legal one.

The development of (global) guidance for post-trade in a DLT environment (for instance by CPMI-IOSCO) could be useful to support standardisation, avoid fragmentation and foster harmonisation of DLT policies.

