



Post-trade made easy

2 September 2016

Distributed ledger technology applied to securities markets

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Euroclear SA/NV's public ID number in the EU Transparency Register is 88290282308-75.

We welcome the opportunity provided by ESMA to provide our input to ESMA's call for evidence.

Introduction

ESMA's welcome consultation on distributed ledger technology (DLT) is a positive sign that European securities regulators are pro-actively monitoring technological developments in securities markets and considering the implications for post trade regulation. However, we believe that DLT also requires a broader policy discussion, both at global and EU level. At an EU level, it is important that the European Post-Trade Forum, ESMA, the ECB and other stakeholders can express their aligned views on the future legislative and regulatory environment supporting DLT developments. At a global level, IOSCO and CPMI should take the lead. Regulatory acceptance will be crucial for DLT solutions to be implemented on a larger scale, and for their benefits to be realised.

Euroclear is actively pursuing initiatives in the DLT domain as it believes the new technology creates new opportunities to bring value, specifically in areas where operational processes are currently underdeveloped, not fully effective or inefficient. As noted in our response, we see many benefits of DLT but also remaining challenges for the DLT to be deployed successfully. Besides the technical hurdles still to be overcome, the regulatory and legal aspects are clearly among the more important challenges. In the absence of responses to these challenges, the benefits of DLT cannot be fully reaped.

From a regulatory viewpoint, DLT is just another technology which might be used by regulated infrastructures such as CSDs, and as a consequence we believe that the existing regulatory rules (which are generally technology neutral) under CSDR and CPMI-IOSCO are broadly sufficient to ensure this new technology is employed in a safe and resilient manner. However, it is also clear that the current legal and regulatory environment may not be optimised to facilitate and benefit fully the widespread use of DLT by a CSD in its core operations. And, DLT may also give rise to changes in market structure where new roles (such as gatekeepers to the ledger itself and managing smart contracts, etc.) could emerge that might not necessarily be performed by existing regulated infrastructures. In that case, such new roles could create new responsibilities and liabilities and may need to be covered by new regulations or standards.

Of course, any regulatory response to such issues will be shaped by the precise design of a DLT solution.

We therefore believe that ESMA may want to analyse what roles or functions could, or should, be performed in a DLT environment and map these against the functions that are (sometimes implicitly) regulated in CSDR and EMIR. It is very likely that new types of infrastructure-type functions could develop which may need a specific regulatory response. We however see no need for institution-specific post-trade DLT legislation.

However, there are areas where adoption of DLT raises legal issues that would not be implicated by the present legacy environments. In particular, the nature of a securities account on a block chain and whether, for instance, application of the PRIMA solution to conflict of law issues is suitable. Euroclear is undertaking further work in these areas and aims to release a public paper on such issues in due course.

1. Possible benefits of DLT for securities markets

Q1: Do you agree with the list of possible benefits of the DLT for securities markets? Please explain, e.g., are these benefits unique to the DLT, are some more important than others, are some irrelevant?

ESMA has indeed identified many of the possible benefits. We would like to note that DLT may not always be the only technology that could bring such benefits.

The potential of DLT to simplify reconciliation processes seems significant under the assumption the end-to-end process would be tackled. By relying on transparent and real-time data contained in a unique ledger, individual market participants no longer need to perform each independently certain data enrichment processes which constitute a source of operational risk, e.g. aligning unique trade data with unique settlement data.

As regards the recording and ownership of assets, we agree that DLT – although not the unique solution - has the potential (in the long term) to facilitate the recording of ownership and access to beneficial owner data by replacing several layers of custody by a flat accounting structure.

However, we believe the authorities and the market need first to resolve:

- (a) how the current models of custody (including location of securities and liabilities related to the depositary function) and omnibus and direct holding structures would evolve, and if they would continue to be relevant, and
- (b) how it would be possible to identify where a record was legally located and what the relevant applicable law would be in a distributed ledger.

The use of a “unique security identifier”, as described in paragraph 14 of the ESMA report however, is not a potential benefit of DLT, since such identifiers already exist and are in use globally; ISINs are at the very heart of securities processing in all global securities markets.

Q2: Do you see any other potential benefits of the DLT for securities markets? If yes, please explain.

As mentioned above, DLT could potentially replace several layers of custody by a flat accounting structure which could mean that information would only need to be recorded in a database maintained and accessed as a single distributed ledger rather than in each separate database layer through the holding chain.

In addition, and in theory, solutions employing DLT have the potential to shorten settlement cycles significantly, which might mean that existing cash and collateral management models are no longer required (because trade and settlement are practically instantaneous). We believe such shorter settlement cycles will be possible only after numerous technical, regulatory and market organisation hurdles are removed. For example, it would require the removal of clearing, a move to real-time gross settlement and the possibility to perform DVP settlement in central bank money.

Q3: How would the benefits of the technology be affected, in the case where the DLT is not applied across the entire lifecycle of securities (i.e., issuance, trading, clearing and settlement, safekeeping of assets and record of ownership) but rather to some activities only?

Given the new nature of the technology and the embryonic nature of DLT initiatives, it is indeed likely, if not certain, that implementation will be fragmented across the trade and post trade value chain. Each institution (occasionally groups of institutions) is experimenting, testing and will probably implement their own solutions.

Regulators will need to pay close attention to such an approach, particularly the linkages between trading, clearing and settlement providers where new operational risks might be created if different parts of the value chain implement different approaches to DLT at different times and with non-standardised business practices. This is particularly true of access between infrastructures (which is now mandated through MIFID2, EMIR and CSDR) and where the use (or non-use) of DLT by one

infrastructure should not be used as a barrier to entry solely because of the complexities of linking a DLT infrastructure to a legacy infrastructure.

However, it is true that DLT would probably bring the greatest efficiency and risk benefits if applied to the entire lifecycle of securities. This would require substantial changes to the current market organisation.

Q4: Which activities (e.g., post-trading, other activities), market segments and types of assets in the securities markets are likely to be impacted the most by the DLT in your opinion? How is the DLT likely to modify the way securities markets operate? Please explain.

It is probably too early to predict how markets may evolve. Although there is still a certain amount of uncertainty as regards which market segments and activities will be most impacted by DLT, trading and derivatives clearing are likely to be less impacted than cash clearing, issuance, settlement, custody and corporate action processing, and most likely in those areas where such processing is currently not so efficient (see answer to Q7 below).

It seems generally easier to reap benefits using DLT in relation to static data (e.g. securities reference data, corporate action information from prospectuses) than for transaction processing.

Q5: According to which timeframe, is the DLT likely to be applied to securities markets in your view? Please distinguish by type of activities, market segments and assets if relevant.

Several experiments and initiatives are already under way. They are looking to increase effectiveness and efficiency of current processes, but also looking how a more disruptive approach could bring value.

As far as settlement, custody and issuance are concerned, concrete applications of DLT are expected to take place within the next couple of years, although most likely in specifically defined areas such as SME financing, processing of gold transactions or private company shares, KYC and AML processes.

On the other hand, the introduction of DLT on a larger scale is likely to take several years; progress will be episodic and will not be linear. This was also the view expressed in the February 2016 Euroclear and Oliver Wyman Joint Report on Blockchain in Capital Markets.

Q6: How might your organisation benefit from the introduction of the DLT?

In a DLT environment, CSDs could start performing new roles such as “trusted guardians” of the integrity of the ledger, e.g. coordinating the issuance of assets in the ledger, managing access and permissions through identify verifications. Of course, some of CSDs’ current roles could be also be challenged by the market change brought by DLT as the need for central players (e.g. as ultimate holders of the legal record) could be put into question.

It is possible that CSDs would also consider using DLT to improve their internal processes. Either by:

- making internal processes better (internal reconciliation, reporting, security)
- taking advantage of improved issuance, trade and post-trade processes outside of the company: (e.g. security lifecycle information gathering at issuance),
- developing solutions within the “broader” post trade area (e.g. in other asset classes like Gold)

Q 7: If you are working on a concrete application of the DLT to securities markets please describe it (i.e., which activities, which market segments, which type of assets and for which expected benefits) and explain where you stand in terms of practical achievements in relation to your objectives.

Euroclear and itBit, a financial services company delivering blockchain services for capital markets, are collaborating to explore opportunities in creating a next generation settlement service for the London gold market. The settlement of unallocated gold is a very capital-intensive process. Euroclear and itBit are working with relevant market participants to develop a service to significantly minimise risk leading to a reduced capital charge, deliver true delivery versus payment and reduce balance sheet constraints. Euroclear has partnered with itBit based on its proprietary blockchain infrastructure technology and flagship product, Bankchain. The Bankchain product is a private network of trusted participants that clears, tracks and settles trades in close to real-time.

BNP Paribas Securities Services, Caisse des Dépôts, Euroclear, Euronext, S2iEM and Société Générale, in collaboration with Paris EUROPLACE, have signed a Memorandum of Understanding to explore together the development of a post-trade blockchain infrastructure for SMEs in Europe. Open to other international partners, this pilot agreement aims to improve SMEs' access to capital markets while facilitating secure and transparent post-trade operations. It is part of the development of a new regulatory environment in France that allows the issue and circulation of securities using blockchain technology.

More generically, Euroclear takes part in certain “incubators” (e.g. Eggsplora) where established financial institutions experiment together with start-ups also in the DLT area to develop solutions (e.g. in area of AML/KYC). Euroclear takes part in the PTDL initiative.

2. Key challenges and possible shortcomings of DLT

Q 8: Do you agree with the analysis of the potential challenges? Please explain, e.g., are some more important than others, are some irrelevant in your view.

ESMA has identified most of challenges.

We believe that the challenge on interoperability between various DLT environments and/or legacy environments could be one of the more difficult to overcome. Introduction of numerous new DLT platforms without standardisation or harmonisation could hinder the realisation of the benefits of DLT and could undo the numerous standardisation and harmonisation efforts performed by public authorities, regulators and industry over the last decade. New “Giovannini-type” barriers could

appear and regulators will need to be vigilant given the access requirements which are now built into MIFID2, EMIR and CSDR.

As most CSDs offer settlement in central bank money, the provision of DVP settlement in a DLT environment assumes that central banks would participate in the DLT to make central bank money available for settlement. At present, it is not clear if and how central banks would be present in a DLT network.

Many questions remain with regard to legal aspects related to the nature of assets represented in digital form, to the nature of records (does the concept of securities account as used in current securities law still hold in a DLT environment?), applicable law, liability of depositaries, responsibility for compliance with KYC, AML, tax reporting, data protection, etc.

We agree that supervisory challenges will be more important as DLT platforms may be operated outside the EU but used by EU clients (and vice versa).

We would also stress the need for a consistent regulatory approach to the treatment of new infrastructure providers that could emerge versus existing infrastructures such as CSDs. See below Q16.

Q 9: Do you see any other potential challenges? If yes, please explain.

A large scale “transition” of assets, activities, counterparties from legacy environments into DLT platforms seems to be very cumbersome, could potentially create systemic risks (e.g. if an entire security would be transferred from a legacy platform onto a DLT platform) and therefore unlikely to occur in the short-term. Such a situation would not only raise operational, technical challenges but also legal challenges (e.g. with regard to underlying securities law) and supervisory challenges (as transit could be made across countries or continents and could encounter various conflicting legal and supervisory systems).

A CSD that would employ DLT in its core processing will need to ensure that the technology allows the CSD to meet all of its regulatory requirements, especially in areas such as provision of DVP settlement, ensuring settlement finality, meeting challenges in operational resilience and cyber resilience. There are several experiments ongoing to analyse if this would indeed be the case.

Q 10: Which solutions do you envisage for these challenges and where do the current initiatives stand in terms of practical achievements to overcome them?

Many of the outstanding challenges will require further technical developments which is generally the objective of the numerous ongoing DLT initiatives. It is important that ESMA and national competent authorities keep an open dialogue to discuss challenges and how to overcome them.

3. Key risks

Q 11: Do you agree with the analysis of the key risks? Please explain, e.g., are some risks more important than others, are some irrelevant in your view.

We generally agree with the key risks of DLT described by ESMA in section 5 of the report. Euroclear is undertaking further work in these areas and aims to release a public paper on such issues in due course.

Q 12: Do you see any other potential risks? Please explain.

See questions 8 and 9.

Q 13: How could these risks be addressed? Please explain by providing concrete examples, especially for the risks potentially affecting your organisation.

No comments.

4. Applicable regulatory framework

We do not comment on questions 14 and 15 which pertain to clearing activities.

Q16: Do you think that the DLT will be used for one of the scenarios above? If yes, which one(s)? If no, please explain?

All three scenarios described by ESMA may materialise, but this should not really affect how regulation applies. We believe ESMA needs to analyse a possible post-trade environment in DLT and determine which type of functions, services or roles can be performed under which regulatory conditions:

- Some of these functions, services and roles will be covered by existing legislation such as CSDR (e.g. notary function for securities admitted to trading, being a Securities Settlement System, provision of settlement in central bank settlement, provision of a settlement discipline regime, provision of settlement subject to SFD protection, etc). In this case, the functions can be performed only by an entity authorised as CSD and CSDR applies (regardless of underlying technology).
- Others functions, services or roles are not covered in CSDR. The latter can be the result of:
 - a) A political decision not to legislate specifically for certain existing functions (e.g. the registrar or transfer agent functions, notary function for securities not admitted to trading, internalised settlement) or to cover these functions in other legislations such as MiFID, AIFMD, etc.
 - b) Specific functions or roles resulting from the introduction of DLT (e.g. provision and maintenance of the DLT platform, determination of DLT protocols, smart contract management, access and identity management, provision of access to the network, links or interoperability between DLT platforms, etc). These are not covered explicitly in the scope of CSDR or other legislation, and could be performed by other entities than existing market

infrastructures. ESMA may then decide if such functions are critical for investor protection, market functioning or financial stability. If so, ESMA will need to determine at which level of criticality they require regulatory coverage.

The below table maps the main regulatory themes relevant for FMIs (mostly inspired by CPMI-IOSCO) which we deem relevant for providers of “other” infrastructure services in a DLT environment which are currently not subject to CPMI-IOSCO or to CSDR. We believe that specifically CPMI-IOSCO may need to broaden the scope of infrastructure service providers to which some of the principles could apply, and may need to introduce new principles as new infrastructure-type roles emerge. EU rules would need to be adapted accordingly.

Main regulatory themes	Global rules	EU rules	Relevance in a DLT environment (assuming infrastructure activity outside of a currently defined FMI)
Legal basis <i>An FMI should have a well-founded, clear, transparent, and enforceable legal basis for each material aspect of its activities in all relevant jurisdictions</i>	CPMI-IOSO PFMI 1	CSDR	Y
Governance <i>An FMI should have governance arrangements that are clear and transparent, promote the safety and efficiency of the FMI, and support the stability of the broader financial system, other relevant public interest considerations, and the objectives of relevant stakeholders.</i>	PFMI2	CSDR	Y
Framework for the comprehensive management of risks <i>An FMI should have a sound risk-management framework for comprehensively managing legal, credit, liquidity, operational, and other risks.</i>	PFMI3	CSDR	Y
Credit risk (in case of CoBM settlement) <i>An FMI should effectively measure, monitor, and manage its credit exposures to participants and those arising from its payment, clearing, and settlement processes.</i>	PFMI4	CSDR – for CSD with banking licence	Y if the new infrastructure would incur such risk
Collateral (in case of CoBM settlement) <i>An FMI that requires collateral to manage its or its participants’ credit exposure should accept collateral with low credit, liquidity, and market risks.</i>	PFMI5	CSDR – for CSD with banking licence	Y if the new infrastructure would incur credit risk
Liquidity risk (in case of CoBM settlement) <i>An FMI should effectively measure, monitor, and manage its liquidity risk.</i>	PFMI7	CSDR – for CSD with banking licence	Y if the new infrastructure would incur such risk
Settlement finality <i>An FMI should provide clear and certain final settlement, at a minimum by the end of the value date. Where necessary or preferable, an FMI should provide final settlement intraday or in real time.</i>	PFMI8	CSDR complemented by SFD (designated SSSs)	Y
Money settlements <i>An FMI should conduct its money settlements in central bank money where practical and available. If central bank money is not used, an FMI should minimise and strictly control the credit and liquidity risk arising from the use of commercial bank money.</i>	PFMI9	CSDR	Y

<p>Central securities depositories</p> <p><i>A CSD should have appropriate rules and procedures to help ensure the integrity of securities issues and minimise and manage the risks associated with the safekeeping and transfer of securities. A CSD should maintain securities in an immobilised or dematerialised form for their transfer by book entry.</i></p>	PFMI11	CSDR (CSDR also defines CSD core and ancillary services)	Y
<p>Exchange-of-value settlement systems (DVP)</p> <p><i>If an FMI settles transactions that involve the settlement of two linked obligations (for example, securities or foreign exchange transactions), it should eliminate principal risk by conditioning the final settlement of one obligation upon the final settlement of the other</i></p>	PFMI12	CSDR	Y
<p>Participant-default rules and procedures</p> <p><i>An FMI should have effective and clearly defined rules and procedures to manage a participant default. These rules and procedures should be designed to ensure that the FMI can take timely action to contain losses and liquidity pressures and continue to meet its obligations.</i></p>	PFMI13	CSDR	Y
<p>Custody and investment risks</p> <p><i>An FMI should safeguard its own and its participants' assets and minimise the risk of loss on and delay in access to these assets. An FMI's investments should be in instruments with minimal credit, market, and liquidity risks.</i></p>	PFMI16	CSDR	Y
<p>Operational risk</p> <p><i>An FMI should identify the plausible sources of operational risk, both internal and external, and mitigate their impact through the use of appropriate systems, policies, procedures, and controls. Systems should be designed to ensure a high degree of security and operational reliability and should have adequate, scalable capacity. Business continuity management should aim for timely recovery of operations and fulfilment of the FMI's obligations, including in the event of a wide-scale or major disruption.</i></p>	PFMI17	CSDR CPMI-IOSCO Guidance on Cyber Resilience	Y
<p>Access and participation requirements</p> <p><i>An FMI should have objective, risk-based, and publicly disclosed criteria for participation, which permit fair and open access.</i></p>	PFMI18	CSDR	Y
<p>FMI links</p> <p><i>An FMI that establishes a link with one or more FMIs should identify, monitor, and manage link-related risks.</i></p>	PFMI20	CSDR	Y
<p>Efficiency and effectiveness</p> <p><i>An FMI should be efficient and effective in meeting the requirements of its participants and the markets it serves.</i></p>	PFMI21	CSDR	Y
<p>Communication procedures and standards</p> <p><i>An FMI should use, or at a minimum accommodate, relevant internationally accepted communication procedures and standards in order to facilitate efficient payment, clearing, settlement, and recording.</i></p>	PFMI22	CSDR	Y
<p>Disclosure of rules, key procedures, and market data</p> <p><i>An FMI should have clear and comprehensive rules and procedures and should provide sufficient information to enable participants to have an accurate understanding of the risks, fees, and other material costs they incur by participating in the FMI. All relevant rules and key procedures should be publicly disclosed.</i></p>	PFMI23	CSDR	Y

Protection of participants in a securities settlement system against impact default of another participant in the system	Not covered in depth	CSDR SFD	Theoretically Y (depends on the type of infrastructure provider)
Recovery and Resolution of FMIs	CPMI-IOSCO rules on recovery and resolution of FMIs	CSDR – BRRD – national rules	Y (depends on criticality of new infrastructure provider)
Asset protection	Not specifically covered	CSDR National Securities Laws Upcoming Securities Law Legislation	Y – will the concept of a securities account still exist in a DLT environment? How will securities ownership be determined? National laws may need adaptation to deal with digital asset holdings directly issued on a DL Ideally, EU securities law could build single legal underpinning in the EU for digital/tokenised assets directly issued on a DL.
Segregation of client assets (choice between omnibus and individual investor segregation)	Not covered	CSDR art 38	Y but depends on the actual DLT solution put in place
Settlement internalisation	Not covered	CSDR	CSDR seeks to introduce transparency in settlement performed outside a CSD/SSS.
Access and identity management/ certification	Not covered	Partly in CSDR (for CSD participant access rules)	May need regulatory rules and oversight.
Data protections and secrecy	Not covered	National rules apply – data location restrictions	Y

Q17: If the DLT is used for one of these scenarios, how could compliance with the regulatory requirements attached to each scenario be ensured?

We see no need for specific post-trade DLT legislation but rather an adaptation of existing regulations to ensure new infrastructure service providers are covered in their scope and that new legal uncertainties (such as those related to securities accounts) are covered adequately. This may best be achieved by Global Regulatory Guidance (similar to that issued by the EBA in relation to the use of Bitcoin by the banking industry). See our response to question 16.

Q18: Do you think that the DLT will be used for safekeeping and record-keeping purposes? Please explain, with concrete examples where appropriate.

We believe that DLT can be used to transfer ownership in financial instruments and, as a result, for “safekeeping” and record-keeping purposes, although both terms would have a slightly different

meaning than in the traditional non-DLT environment. We note, however, that pages 27 and 28 of the Discussion Paper seem to mix three separate concepts:

- Maintaining the integrity of the issue, which today is intrinsically linked to the notary service performed by CSDs, although other entities, like transfer agents, can also be responsible for it;
- The registration of securities and the maintenance of the register of securities holders (which can be performed by CSDs, or other entities); and
- The safekeeping of securities (which may or may not be registered).

Q19: If the DLT is used for the safekeeping and record-keeping of ownership, how could compliance with the regulatory requirements be ensured?

See our response to question 16.

Q 20: Do you think that the DLT will be used for regulatory reporting purposes? Please explain, with concrete examples where appropriate.

We understand that there are already projects looking at how counterparties to a transaction could seal and report their deals using a smart contract, whose terms would include all the aspects needed for the transaction reporting, with data stored on a DL.

Q 21: If the DLT is used for regulatory reporting purposes, how could compliance with the applicable regulatory requirements be ensured?

No comments

Q 22: Do you think that the DLT could be used for other securities-related services than those already discussed, in particular trading and issuance?

National (or EU) securities law may need to be adapted to allow issuance directly on a DL.

Q 23: Do you see potential regulatory impediments to the deployment of the DLT in securities markets?

As we have indicated above, while the use of DLT itself by a CSD, for example, does not trigger any new regulatory approvals the current regulatory and legal environment is not optimised for its widespread use. There remain a number of uncertainties around the nature of as securities account, interoperability and access, data protection etc., which regulators and the market need to resolve together over the coming months.

Q 24: Should regulators react to the deployment of the DLT in securities markets and if yes how? If you think they should not do so, please justify your answer.

As indicated in our response to Q16, we believe that ESMA, together with IOSCO and other international regulatory bodies, should proactively monitor the deployment of DLT in securities markets and develop a solid understanding of the technology and its applications. Innovation should

not be stifled, but reaping the potential benefits of DLT will be facilitated by a predictable, clear, consistent and transparent regulatory framework.

We therefore recommend that regulators pursue their efforts in assessing the benefits and risks of an environment in which DLT is used, looking at the resulting market organisation both from the perspective of investor protection and as of financial stability. The analysis should go beyond existing rules applying to current post-trade infrastructures and should probably involve a consideration of new post-trade infrastructure roles that could emerge and if and how to regulate them.

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