17 July 2017

Matthias Bauer  
Strategy and Competition  
Financial Conduct Authority  
25 The North Colonnade  
Canary Wharf  
London E14 5HS

Via electronic submission

Dear Sir/Madam,

**FCA Discussion Paper on Distributed Ledger Technology**

State Street Corporation appreciates the opportunity to comment on the FCA Discussion Paper on distributed ledger technology (‘DLT’).

State Street Corporation (NYSE: STT) is one of the world's leading providers of financial services to institutional investors, including investment servicing, investment management and investment research and trading. With $29.83 trillion in assets under custody and administration and $2.56 trillion\(^1\) in assets under management as of March 31, 2017, State Street operates in more than 100 geographic markets worldwide, including the US, Canada, Europe, the Middle East and Asia. For more information, visit State Street’s website at [www.statestreet.com](http://www.statestreet.com)

State Street recognises that new financial technologies are changing the way consumers and firms access financial services. The impact of FinTech is likely to have implications for the whole sector and has the potential to increase efficiencies for consumers of both retail and wholesale services. Our responses to the questions raised in this consultation are largely from the point of view of our role as a custodian bank.

As a leading custodian bank, State Street is embracing the potential benefits FinTech has to offer our clients, most notably in relation to Blockchain and DLT, as it can help improve how we provide services to institutional investor clients. While Blockchain and DLT can deliver benefits in terms of increasing efficiencies, we believe, however, there will still be the need for an element of trust and authentication provided by a third party like custody banks when Blockchain and DLT are implemented for many custody and asset servicing activities. The current regulatory framework has been refined and developed over decades, and while regulators should strive to encourage and support innovation, they should ensure new technologies fit within the existing regulatory frameworks that have been designed to protect investors and the financial system from undue risk.

As way of background to our involvement with DLT to date, we are currently members of several industry consortiums, including the Enterprise Ethereum Alliance (EEA), the Hyperledger Project,

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\(^1\) AUM reflects approx. $33.30 billion (as of March 31, 2017) with respect to which State Street Global Markets, LLC (SSGM) serves as marketing agent; SSGM and State Street Global Advisors are affiliated.
and the Post Trade Distributed Ledger group, and collaborate with other banks on DLT use cases and thought leadership across the globe.

In addition to our membership of several industry consortiums, we launched the Emerging Technologies Center ("ETC") in 2015. The ETC’s primary mission is the identification, exploration and prototyping of emerging and disruptive technologies that could have a long term impact on State Street and the financial industry. Along with our business units and IT groups, the ETC leads internal prototype development and external startup engagement to quickly prove whether a particular technology requires a longer term and broader focus.

In addition to DLT, we have been experimenting with concepts such as data protection and data immutability, cryptographic data lineage tracking, system automation through “smart contracts”, decentralized and distributed message communications and reference data repositories. Additionally, we are exploring advanced technology topics such as cognitive computing as well as business areas such as, digital advisory services, and predictive analytics services for portfolio and risk management.

Thank you once again for the opportunity to comment on this Discussion Paper and please do not hesitate to get in touch should you wish to discuss our answers in more detail.

Sincerely,

Pinar Emirdag

Pinar Emirdag
Head of Digital Product Development and Innovation
Questions

Governance and technology resilience

Q1: How will firms demonstrate appropriate outsourcing arrangements when relying on third parties (such as core developer groups of public, permission-less networks) to deliver DLT-based solutions?

In our view, a DLT-based securities settlement and/or custody service is unlikely to find market acceptance if based on a permission-less basis.

The confidentiality of information lies at the heart of all client relationships in the financial sector, and this suggests that a permission-based system with authorized participants would be the desired approach and more appropriate for use in the financial industry than an open DLT.

Further to this, we believe that replicating the open and transparent type of distributed ledger utilized by Bitcoin will not be necessary, as a permission-based DLT system can still deliver all of the benefits of an open-system while protecting user privacy as well as ensuring risk reduction.

In addition we wish to highlight that at present, it’s unclear if a node in a permissioned DLT network run by a Central Securities Depository (CSD), or sub-custodian bank, would be considered a legal outsourcing in which case the typical outsourcing rules apply. However, this would imply a material business change if custody account relationships would fall under outsourcing requirements. In this case, any benefits DLT may have may not outweigh the downside in terms of costs to the industry being passed on.

Lastly, we note that the FCA, and other regulatory bodies, have existing rules and guidance in relation to outsourcing and technology, and we believe it is important that these continue to apply to the implementation of DLT systems in order to ensure sufficient regulatory safeguards.

Q2: What operational risks have firms identified with (i) implementation of DLT systems (ii) system-wide issues affecting multiple firms, and how will they manage them?

The implementation of DLT poses a number of risks and challenges for industry participants and regulators. For example, the confidentiality of information requires a permission-based system that is both scalable and interoperable. Further to this, legal certainty requires the creation of a harmonized set of rules setting out the rights, obligations, protections, and enforcement of laws for investors and financial intermediaries with assets on the DLT.

- Confidentiality

As stated earlier, a permission-less network is unlikely to allow financial firms to manage their operational risk effectively. Only a permissioned network with a clear software release management, and prior testing and sign off by participants, would ensure firms control IT software issues.

Further to this, we believe the implementation of DLT will present a number of operational challenges. For example, a DLT network would usually require that a certain percentage of nodes are active at a given moment in time to perform the validation of new instructions. A participant may by unable to have new instructions added to another block due to the technical failure of a significant number of other participants, not necessarily even related to the participants instruction, which would increase the risk of settlement fails.
• Scalability and Interoperability

Scalability and a greater sense of working with familiar, known parties within the DLT network promises to make permissioned DLT systems more appropriate for use in the financial industry than a permission-less DLT. Multiple DLT systems will likely exist based on business needs and performance needs, and as such, protocols and standards will be required for DLT interoperability to ensure the smooth functioning of markets, as well as realisation of the network benefits that these technologies could offer. In addition, large scale roll outs will require in-depth understanding of the infrastructure needs of the institutional and retail clients.

• Data governance

In addition to the above, we also wish to highlight that many of the benefits associated with DLT-enabled solutions for securities custody and settlement require a high degree of standardization and harmonization concerning data governance (e.g. Standard Settlement Instructions), process standardization and clarification of liability for data fed to the DLT system or processing results. It is therefore important that regulators and standard setters develop an appropriate level of data standardisation and governance in conjunction with industry participants.

Q4: What technology resiliency advantages, if any, does DLT have over other types of systems currently available?

The technology resilience advantages depend on the specific DLT system being implemented. Indeed, such advantages are not necessarily inherent to a DLT based network since it depends on the “institutional design element” of the specific DLT network itself. For example, if a DLT network is designed with a single principal entity with super rights over other nodes, the network could also be vulnerable to a cyber-attack on this node. We note that different software solutions currently envisaged have different levels of flexibility in this regard.

However, we would agree that in relation to a core securities settlement system, it seems logical that a DLT network would offer resiliency advantages over a central market infrastructure.

DLT and distributed data

Q6: What use cases have been live tested for regulatory reporting? What challenges are there to implementing these solutions?

One key challenge to the successful implementation of DLT systems is the need for the harmonization and standardization of reference data as it is becoming increasingly critical to the safety, soundness and efficiency of global financial markets and is arguably fundamental to the regulatory reporting of DLT systems.

Currently, there exists much ambiguity in the interpretation of reference data across multiple sources which potentially leads to differences in the various aspects of the servicing of the financial instrument from trade execution, to settlement, accounting and valuation. We also believe that the standardization of reference data will allow all financial participants to speak a common language thus promoting efficiency of the global financial markets.

State Street therefore strongly supports initiatives that promote the harmonization and standardization of reference data.

2 http://www.bis.org/cpmi/publ/d157.pdf page 7ff
Recordkeeping and auditability

Q8: Is this a viable use case for DLT in the context of asset management? What other examples are there for this sector?

Global custodians like State Street provide financial services to a wide range of participants in the asset management sector such as institutional investor clients, including mutual funds and other similar collective investment funds, alternative investment funds, corporate and public retirement plans, insurance companies, foundations, endowments and other investment pools.

Such services comprise of safekeeping and record keeping, transaction processing and settlement, asset servicing reconciliation and post trade services and various ancillary services. Please see our answer to question nine for further details on how we believe DLT implementation could create efficiencies in the provision of these services.

Q9: What other examples are there of DLT providing direct and tangible benefits to consumers? What are the risks associated with these?

DLT is exciting, potentially transformational, technology and much has been expressed about the manner in which it will be able to improve financial market processes and efficiency, as well as record integrity and protection. It is also technology for which significantly more development and application to current operational functions will be needed in order to fully realise the opportunities it presents.

As a custodian, we believe emerging distributed ledger technologies will have significant impact on the services we provide to our institutional investor clients, and that such technologies will, if properly structured, governed, and regulated, be beneficial to securities markets and investors in a variety of areas, particularly in clearing and settlement, recording of ownership, and safekeeping of assets.

However, it is important to emphasize there will still be the need for an element of trust and authentication provided by a third party like the custody banks when some forms of Blockchain and DLT are implemented. The current regulatory framework has been refined and developed over the decades, and while regulators should strive to encourage and support innovation, they should ensure new technologies fit within the regulatory frameworks that have been designed to protect investors and the financial system from undue risk. From our perspective as a custody bank, this includes the protection of investor assets, the efficient settlement of transactions, the secure flow of payments, and appropriate safeguards to address cyber-risk.

Below are some of the benefits we believe the implementation of DLT could bring in the term of the provision of core custody services.

- Safekeeping

Safekeeping comprises the storage and maintenance of assets held on behalf of clients who benefit from our relationships with local depositories, sub-custodians and agent banks. Our customers, which include mutual funds, collective investment funds and other investment pools, corporate and public retirement plans, insurance companies, foundations and endowments worldwide, engage us for a variety of safekeeping services, including opening and maintaining securities and cash accounts, selection, monitoring and management of sub-custodian and cash clearing relationships, creating and maintaining records of assets, registration of securities, and ensuring agreement between the books and records of the client, sub-custodian and global custodian.
We expect the most direct impact of the implementation of DLT to be on CSDs as they move to

electronic shares and the digitisation of records. Custodian safekeeping and record keeping

services will also likely benefit from efficiencies as a result of DLT though its use is likely to raise

significant questions around ownership rights. In addition, the feasibility of CSDs adopting DLT-
driven solutions may require regulatory clarification insofar that CSD participants operating a node

as part of a DLT-enabled settlement system governed by a CSD would not be considered as

outsourcing from the CSD to its participants.

- Transaction Processing and Settlement Services

Transaction Processing and Settlement services involve the facilitation of securities settlement in

order to complete the purchase or sale of assets on behalf of our clients via access to the global

post-trade infrastructure. These services include the processing and confirmation of transaction

settlement instructions, exchanging cash for securities, either purchased or sold, and managing

and reporting failed trades during the post-settlement process.

We expect the benefits from the use of DLT to include the streamlining of matching, confirmation,

messaging instructions due to the use of smart contracts which would make asset classes easier

to trade and drive down execution costs and fees. In addition, DLT could also facilitate the move
to a T+0 settlement cycles.

- Asset Servicing

Asset servicing is another key service provided by custodian banks and is comprised of activities

undertaken on a directed agency basis in connection with the administration of assets held on

behalf of clients and includes a number of functions, such as processing corporate actions,

crediting of income entitlements, notification and execution of proxy voting rights, managing tax

relief, reclaim, exemptions and withholding, and maintaining market information on assets held,

including pricing, reference and derivative services.

Currently we believe DLT and Smart Contracts could impact some aspects of asset servicing

such as the processing of mandatory corporate actions.

- Ancillary Services

In addition to these core custody services, custodians also offer other financial services that are

ancillary to the custody function, including agency fund accounting and valuation, securities

lending, foreign exchange, performance measurement and analytics, and market information

services. Although a wide range of providers offer these ancillary services, the business model of

custodians positions them well to offer such services to their custody clients.

Ancillary functions, such as cash management, fund accounting, NAV calculations, FX, analytics,
collateral management, may be transformed or streamlined as DLT systems are implemented.

In order to be successful, we believe DLT solutions will need to be properly structured, governed,

and regulated. The resulting reductions in costs, lower reliance on manual interventions, better
data assurance, higher transparency, reduced settlement risk, and new products and services will
all benefit the investing public.

We believe there a number of other areas where DLT could be extended to other areas in order to

benefit consumers such as tax processing for cross border securities investments. However, we
note that the identification and data requirements for shareholder registration and the exercise of
voting rights is subject to a variety of requirements under national law and company requirements.
**Smart contracts**

**Q10: How do respondents see the use of smart contracts developing in financial services? Please provide examples, ideally which have been already live tested.**

We believe smart contracts\(^3\) have the potential to increase efficiencies and help drive down costs for end-investors through the storage and execution of business logic for increased automation and the reduction of manual touch points.

Specifically, as highlighted above, we believe the use of smart contracts could have impacts for transaction processing and settlement services as well as for asset servicing.

For transaction processing and settlement services we expect the benefits from the use of DLT to include the streamlining of matching, confirmation, messaging instructions due to the use of smart contracts which would make asset classes easier to trade and drive down execution costs and fees.

In relation to asset servicing, we currently believe DLT and smart contracts could impact some aspects of asset servicing such as the processing of mandatory corporate actions.

In another consideration, the proper use of “smart contracts” could help regulate which users can participate in a given DLT system, and can be tailored to implement the required governance framework to ensure proper usage.

**The use of digital currencies to deliver financial services / Digital currencies as a means of exchanging value**

**Digital currencies as a means of record keeping**

**Q13: What are the risks to competition of a group of incumbents operating a closed network to the exclusion of others?**

Fair access to networks and market infrastructures should be the guiding principle when considering the treatment of closed networks of participants.

**Q15: Do firms see the above examples as realistic use cases for DLT in securities issuance and trading?**

As a foundational technology, it is possible that DLT has a role in empowering securities issuance and trading at least in certain markets though this would be dependent on a number of factors such as speed and throughput.

**Q17: Are there other parts of regulation where DLT might offer a new market convention?**

As with typical market developments the development and deployment of new technology creates new process and system flows which necessitate the need for new market conventions. In our role as a global custodian and provider of investment services we have significant experience of dealing with the impact of new technologies on markets and we believe the key to ensuring the development of effective market conventions is regulators working alongside industry, a sufficient level of global coordination and an awareness of potential impacts of new technology on downstream processes.

\(^3\) “Smart Contracts” - the storage and automatic execution of business logic based on conditions