GLOBAL TAXATION

In a report on Distributed Ledger Technology (DLT)[197] published in January 2016, the United Kingdom (UK) Government stated that DLT "has the potential to redefine the relationship between government and the citizen in terms of data sharing, transparency and trust."[198] The report went on to identify a tax collection of incidences as a major use case for DLT that governments should instigate and be actively involved with as the technology matures.

Historically, the fundamental redistributive role of the state has been based on centralized and fiat-based systems. But with DLT, individuals, corporations, and states can exchange identity, trust, data, and value without the need for the (inter-)mediation of a central authority. DLT enables a move away from bilateral trust relationships. Now tax authorities can join trust networks, be part of their governance arrangements and witness in real-time the tax events that create obligations to the state. Tax authorities can make decisions about the tax implications of those events as they happen. Simply put, tax can 'just happen'. Such adoption and synchronization of all DLT elements in tax will take time to develop. However, many early benefits that DLT affords are already becoming visible and are outlined in this report.

This report examines the state of domestic and international applications of DLT in tax administration, assesses where efforts to standardize and ensure interoperability of systems can be concentrated, and recommends how tax authorities can generate significant value, realized by governments and taxpayers alike. Many more fundamental matters that individual states and their governments should consider as the world becomes more distributed are beyond the scope of this report. You can view the full Global Taxation report here.

DIGITAL IDENTITY

Digital identity (DID) assurance is critical to fair, just, and efficient taxing systems. Costly efforts have been initiated to ensure accurate and secure identities; however, as long as confidential information is maintained in centralized repositories, future attacks and breaches are inevitable.

KEY RECOMMENDATIONS

Tax as a prime use case

Tax administrations can reuse and leverage existing Know Your Customer (KYC) approaches of private sector financial service providers. A cross-government approach is desirable, including all layers (national, sub-national, and municipal); the tax administration use-case for such a system could be an effective exemplar for this multi-layer approach. This includes a standardized digital identity framework and roadmap for implementation that supports the necessary technical development and resource management.

Additionally, this will ensure tax requirements are aligned with other governmental service delivery functions across tax, trade, social services, justice, welfare distribution, government-supported utilities, etc. This framework should be supported by the selection of sufficient technical tools to ensure data security, integrity, and availability expectations are met. Various state databases containing and collecting digital identity information can be well managed and diminish the incidence of actual data exchange using DLT. As this approach matures, DLT-based systems will help to ensure the transparency, cost-effectiveness, integrity, and high credibility of data management processes.

Interoperability

Organizations need to collaborate to ensure tax data is accurate with proper security measures in place. This will help in appropriate tax risk analytics and reporting measures. In addition, this will reduce (but never eliminate) potential fraudulent tax-related activities in which different identities are established and verification and validation can be challenged.

If an assured identity system works for the financial arrangements between government and citizen, then others (welfare, pensions, health data management, and broader governmental service access) can work in a similar interoperable fashion.

LEGAL AND REGULATORY

Most tax legislation predates the sort of distributed systems enabled by DLT. If the full benefits of the technology are to be realized, not just in tax but with respect to any government program or process, there needs to be a thorough analysis of existing legal and regulatory barriers. Any successful project depends not only on mapping the issues but also on addressing the barriers. Governments and businesses must work together to ensure the legal and regulatory regime is fair and relevant. Applying blockchain in an international context introduces a further layer of complexity in this realm.

KEY RECOMMENDATIONS

Address the challenges stemming from the legal/ regulatory framework

- Review the existing legal framework, and group rules by the following classifications, execute the designated actions

- Rules that are redundant in the context of blockchain (e.g., physically certifying documents). Redundant rules should be repealed and substituted with new rules relevant to blockchain infrastructure (see below).

- Rules that impose barriers but are necessary (e.g., protection of fundamental individual rights, such as privacy). Appropriate actions may include leveraging innovative technology like Zero-Knowledge Proofs (ZKP), which can protect privacy within transactional tax regimes, such as VAT and withholding taxes.

- Rules that include a significant element of subjectivity or ambiguity (e.g., anti-avoidance rules) and therefore prevent binary outcomes based on quantifiable objective factors. See below for appropriate actions.

EXPLORE OPTIONS FOR ADDRESSING LEGAL AMBIGUITY

Technological Solution

Determine whether the current state of natural language processing (Artificial Intelligence) capabilities can adequately analyze legal provisions and case-law with sufficient precision.

Legal Solution

Consider introducing binary objective criteria that trigger rebuttable legal presumptions, the outcomes of which can be revisited at the request of the authorities or the taxpayer.

Review Outcomes

Provide for a possibility to review outcomes in case of dispute resolution and embed such possibility in the blockchain system (e.g., by having a trusted party that can implement changes).

IDENTIFY THE CHALLENGES THAT ARISE IN CROSS-BORDER SITUATIONS

Divergent legal frameworks across jurisdictions leading to different legal qualifications of similar fact patterns.

Technological Solution

Explore the technical feasibility of smart contracts accounting for different legal frameworks across jurisdictions, depending on a protocol that attributes jurisdiction to tax to a given country or countries.

Legal Solution

Coordination of the legal framework, thus ensuring greater consistency (especially feasible within regional integrated blocks such as the European Union).

International Exchange of Information under Article 26 of the Organization for Economic Co-operation and Development (OECD) Model Tax Convention[199] or the Directive on Administrative Cooperation (DAC) relies on communication only between tax authorities, excluding the possibility for direct exchange between private parties and foreign authorities.

Legal Solution

Amend the Exchange of Information rules, allowing for direct data sharing between private parties and foreign authorities. This may be achieved on a bilateral or multilateral basis.

Technological Solution

Automatic exchange of information in real-time between tax authorities, based on a blockchain solution.

ESTABLISH THE QUALITY OF DATA AND ITS IMPACT ON LEGAL RESPONSIBILITY;

the quality of the output of the blockchain system is entirely dependent on the quality of the data input

Importance of standardized data, especially for cross-border data exchange; consider alignment to a global standards organization, such as the National Institute of Standards and Technology (NIST) or the Organization for the Advancement of Structured Information Standards (Oasis).

Importance of intermediaries (e.g., banks, telecommunication providers, other digital platforms) with robust KYC programs, for providing the necessary data.

Determination of legal responsibility when the data provided is dependent on a due-diligence standard (e.g., due diligence commensurate with the activity in banking or financing activities).

ENSURE THAT ANY TAX-DLT SYSTEM IS COMPLIANT WITH GENERAL DATA PROTECTION REGULATION (GDPR) OR SIMILAR GOVERNMENT DATA ACT

Prohibition of decision-making by automatic means (e.g., Article 22 of the GDPR); there needs to be a possibility for human review and adjudication.

'Right to be Forgotten'

Possibility of erasure; determine whether such principles may undermine the immutability of the blockchain.

Private Data

Explore the possibilities afforded by Zero-Knowledge Proof advanced cryptographic capabilities.[200]

ALIGN WITH COMPETITION LAW

Although this point is beyond the strict taxation scope of this report, there is a need to monitor industry-commercialized blockchain-based taxing systems for the incidence of competition amongst DLT systems. It will be important to analyze the different means of validating transactions and the possibility of systems containing commercially sensitive data, which could be used for illegal price setting and anti-competitive behavior.

DATA MODEL FOR TAX

A decentralized solution may decrease the amount of continuous effort currently needed to monitor, administer, and police compliance with tax obligations. A blockchain solution necessitates an upfront fixed investment with variable, but controllable, future maintenance costs. A decentralized data model is also conducive to preventing information from altering. Therefore, it could assist in addressing tax avoidance incidents and equip policymakers with enhanced data transparency and traceability. Improved transparency will also support better policy design decisions. Decentralized data infrastructure brings clarity and simplicity to a confusing and challenging process.

> A decentralized data model does not translate into higher taxes, but rather offers a more efficient means of taxation that, in turn, yields advantages for tax authorities and taxpayers alike.

KEY RECOMMENDATIONS
Data Framework

Consensus Protocol

The two most prominent consensus protocols are: Proof-of-Work (PoW) and Proof-of-Stake (PoS); they have their own benefits and costs. When designing a data infrastructure, the decision on which mechanism to deploy should involve a robust cost-benefit analysis.

Coordination of Data Ingestion

Coordination is a key component while fulfilling a data model; however, blockchain, by design, is a decentralized system that brings trust-less nodes together. The technology itself facilitates many stakeholders (nodes) in coordinating and validating transactions. Pilot programs are thus advised to stress-test the developed data infrastructure and ingestion processes.

Associated Costs to Consider

Questions to address should include timing: whether onboarding of the historical data from previous years into the new form of a data model is required. If not, how would the old data model be compatible with the new data model in case there is a need to access and act upon older data? It is also important to consider the costs associated with educating taxpayers on how to use the system.

Security and Systematic Risk Management

A multi-phase process should be developed in the unfortunate scenario of data leakage, data hacking, or other form of systemic failure. The first phase should be an immediate technical response to mitigate the risk. The second phase should consist of the following actions, executed in parallel or series: communication plan; compensation program aligned to the data breach, and a legislative/regulatory framework pre-developed to protect and support those affected.

GOVERNANCE DATA MODEL

Governance of the decentralized data model could be divided into two general themes (on-chain data governance and off-chain governance) with three associated layers (off-chain community, off-chain development, and on-chain protocol).[201] To design an efficient blockchain tax data infrastructure, it is important to recognize that off-chain components do not exist in isolation from their on-chain counterparts, since both elements

are mutually dependent, and thus should be designed in unison.

INTERSECTION OF ARTIFICIAL INTELLIGENCE (AI) AND BLOCKCHAIN

AI brings sophisticated data analytics to tax to optimize compliance and effectively transform tax into an innovation hub, while generally empowering the tax function.[202] Blockchain offers transparent, validated, and structured data sources necessary for AI model building and deployment. AI systems partnered with blockchain can produce new insight to substantially improve information security, system scalability, fraud reduction, and governance.[203]

GOVERNANCE

A blockchain infrastructure for tax purposes will require special governance arrangements. The critical roles of each party should be clearly defined and built into the Information Technology (IT) infrastructure, along with appropriate incentive mechanisms that will enhance the long-term viability of the DLT system by encouraging participation by a multitude of stakeholders. The tax ecosystem encompasses a wide variety of actors. Thus, it is important at the outset to define a set of shared principles that reflect the aspirations of the members of the ecosystem and serve as guidelines in developing blockchain solutions.

KEY RECOMMENDATIONS

Delivering Mutual Tax Certainty

The overriding objective of a tax-based blockchain infrastructure should be to deliver faster tax certainty for both the taxpayer and the tax administration. This means that there should be certainty around: (i) the identity of those operating on the ledger; (ii) the fact that the taxable event has occurred as recorded in the chain; and (iii) including all relevant information to automatically assess tax implications.[204]

Protecting Taxpayer Rights

The protection of taxpayers' rights is a fundamental and critical element. This effort should be focused on a robust dispute resolution mechanism, appropriate guidance on burden-of proof, identity management, and digital inclusiveness.

Providing an Integrated Value Proposition

Distributed ledger technologies will also require clarity regarding when it is acceptable to use data for purposes other than those for which the data was initially provided. Thus, it is important to: (i) avoid establishing siloed systems when an integrated system is more effective; (ii) consider including services of value to the taxpayer, even if they are not tax related; (iii) embed information requirements from other government entities rather than establishing parallel systems; (iv) avoid replicating existing processes found in paper-based or legacy IT systems; and (v) define the integrated value proposition for both private and public stakeholders when participating together in an ecosystem.

Applying the Principle of 'Subsidiarity' When Selecting a Platform

Taxation is incidental to economic transactions. Therefore, a blockchain-based tax platform may not be the best general purpose technology option if there exist current solutions in the market where taxation can be effectively incorporated. For example, it may be more efficient to embed taxation into a digital payment, commerce, or supply chain solution rather than establishing an entirely new tax system.

Ensuring the Resilience of the Blockchain

Tax-related blockchain systems will require: (i) a very high degree of uptime; (ii) effective authentication of the actors operating on the blockchain; (iii) a robust information security arrangement, including protection of commercial secrets; (iv) predictability in change management since the system interfaces with other systems within and outside the tax administration; (v) capacity to train users and handle complaints and queries; (vi) monitoring

of the system; and (vii) a proper dispute resolution mechanism.

Promoting participation and inclusion of multiple stakeholder classes in system design and development

Longer and more intensive, participatory processes are likely needed to effectively design blockchain systems. Multi-stakeholder classes should be represented in the governance structure of the DLT system (participation) and decision-making rights should be carefully considered to ensure all relevant and material stakeholder classes are represented by a governance member with a recognized, and valued, decision-making vote. The discourse should in any case address the following seven governance dimensions: system development/maintenance roles; participation incentives; membership; communication amongst stakeholders; decision-making; initial system formation and launch; and context-specific rights and obligations of stakeholders.

Establishing a Governance Board/Framework

The aforementioned governance elements need to be included in an overarching governance framework and associated board where all relevant stakeholders are properly represented. Special governance arrangements will likely include: (i) earlier, longer, and more intensive consultations processes to understand how the blockchain systems interact with existing processes in the public and private sectors; (ii) a robust change management mechanism, as upgrades to the blockchain system are likely to have ripple effects; (iii) a process for encouraging and processing unsolicited proposals; and (iv) a program to foster a vibrant conversation across the ecosystem addressing needs of the multi-stakeholders.

While there are few tax-related DLT systems with robust and carefully constructed governance models from which to leverage, there are several technology-laden systems impacting a multitude of stakeholders with impressive governance models

Consider, for example, the Global Vaccine Alliance (GAVI)[205] for a nuanced and precise governance model, DHIS2,[206] an open-source digital health information system for a streamlined governance model uniquely tied to a university (University of Oslo), and Mojaloop,[207] an open-source software payment system employing a foundation model across an efficient mix of public and private sector actors.

PRIVACY AND TRANSPARENCY

DLT has created an opportunity to rethink the traditional balance between privacy and transparency across tax policy, law, and processes. While digital technology is enabling better tracking and reporting of economic activity, the concept of taxation and the associated administrative burden have remained largely unchanged. DLT can free institutions, the economy, and society to rethink deeply embedded paradigms outside of the traditional constraints of data collection and management.

Privacy and transparency should also be qualified by the subject (person or organization) at issue, the entity bequeathed with the authority to enforce privacy and transparency, and the scope of the tax-related data being made private or transparent (e.g., all DLT data or only cross-border transaction data). Technologies such as Zero-Knowledge Proofs (ZKP) may also play a key role here. Applying ZKP-technology, one party (the prover) can prove to another party (the verifier) that they know a value x, without conveying any other information. Privacy-preserving technologies such as this may enable compliance with required privacy standards and legislation, although further development may be needed.

KEY RECOMMENDATIONS

Put citizens in control

For a balance between privacy and transparency to evolve as technology evolves, a social license to innovate is important and should be maintained. It is recommended that safe, secure, and easy to use custodial solutions be provided so citizens can own their identity keys, building a partnership approach between responsible authorities and citizens, whereby a clear balance is considered between providing the relevant data and maintaining privacy and control from a taxpayer's perspective.

Policymakers should leverage the power of smart contracts to mirror existing legal, regulatory, and contractual restrictions on data usage and sharing

There are opportunities for public and private sector actors to launch proofs of concept and pilots with DLT systems that adhere to current legislative, regulatory, and contractual limitations.

Consider the use of Non-Fungible Tokens (NFTs)

NFTs provide the opportunity to establish that data is unique and immutable, its true ownership, and its associated permissions. The ability to locate meta-attributes around the data, and verify the data as being unique, could be a way of balancing privacy and transparency in a way that is comfortable to citizens and businesses and enables them to make decisions about the costs and benefits of sharing their data, while recipients of the data can be assured of its validity and ownership.

Policymakers should consider the introduction of an Immutable Notarization Blockchain for Taxation Data

One key challenge in the potential utilization of blockchain and DLT technology for greater transparency in the digital taxation domain concerns the data privacy of relevant entities who participate in the DLT network. Often transactions between parties are confidential to these parties, with the taxation authority, possibly being the sole third party legally permitted to further query into the transaction details. In these use cases, there is an inherent tension between the benefits of DLT technology for transacting parties and the danger of loss of privacy for the parties. Thus, blockchains and DLT technology must continue to develop to address these privacy concerns.

One potential solution is to retain only a minimal trace of the transaction, by way of capturing on the blockchain only the cryptographic hash of the transaction records. This is known as a "hash-only blockchain," a digital notarization blockchain which functions much in the same way as legal, human notaries. In this system, when two transacting parties arrive at a taxable event, both parties compute the cryptographic hash of their relevant documents and evidence of the payment. They then utilize the blockchain to store only these hash/digest values together with the appropriate record-identifier. Each party retains their complete data records in their respective private databases.

In this case, the blockchain acts as a decentralized, automated notary that keeps an immutable list of these hash values, thus preventing parties from modifying their data records. Relevant government authorities can later request these transaction data

records from the parties and recompute the cryptographic-hash values for these records and compare these hash values against those found on the blockchain. This provides assurance that none of the parties have illegally modified these data records after the taxable event has occurred.

Tokenized currency that can execute governance requirements associated with transactions could enable a broader range of taxable events or could enable a more targeted approach to taxable events

This could be accomplished by programming a tax office-approved corporate policy into the transaction or by making the amount of tax due so small as to be negligible on a per-transaction basis. The central role of a taxation authority could be reconfigured and risks associated with the implementation of new transaction and currency systems reduced.

CONCLUSION

There is no doubt that DLT will continue to have significant effects on finance, tax, trade, and other settings where many actors in a system need access to assured real-time data about a transaction. Governments have the option, of course, of stepping back and letting the market take its course. That way, if DLT is

not fit for purpose and cannot be implemented at scale and in compliance with existing frameworks, it will fade away and a lot of time and trouble will have been saved.

This working group holds that stakeholders should be directed to further develop blockchain technologies, in general, across certain key use-cases, including tax. For tax specifically, we suggest all involved in tax administration, domestic and international, public and private, engage with this breakthrough technology and understand what it means for the tax systems that support the financial and societal stability of our nation-states.