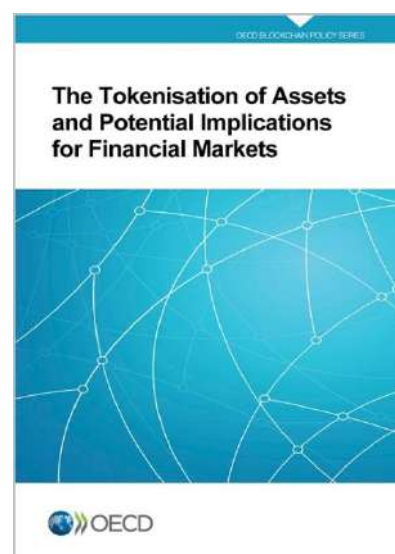


THE TOKENISATION OF ASSETS AND POTENTIAL IMPLICATIONS FOR FINANCIAL MARKETS

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Asset tokenisation has become one of the most prominent use-cases of distributed ledger technologies (DLTs) in financial markets, for assets including securities (e.g. stocks and bonds), commodities (e.g. gold) and other non-financial assets (e.g. real estate). Tokenisation of assets has potential cross-cutting implications for financial market practices and participants, market infrastructure and regulators across a large range of financial instruments and asset classes.

Tokenisation of assets involves the digital representation of real (physical) assets on distributed ledgers, or the issuance of traditional asset classes in tokenised form. A recent OECD report examines the benefits of asset tokenisation and the challenges to its wider adoption. It analyses the potential disruptive effect that a potential proliferation of tokenisation would have on financial markets, and in particular on trading, liquidity, pricing, clearing and settlement. The report highlights the increased importance of a trusted and credible central authority, (such as a custodian) in a tokenised environment to guarantee the connection of the conventional, “off-chain” world, with the blockchain (for example, to guarantee the existence and custody of unique assets backing the tokens). Tokenisation of assets may also involve the possible necessity for a tokenised form of central bank digital currency or stablecoin for the payment leg of security settlement on DLT-based trading venues. The report discusses the conditions that would justify a meaningful transition to a tokenised environment and the markets where a wider adoption of such practices could be envisaged, and provides policy implications of tokenisation for the financial markets.



The OECD report highlights that further adoption of DLTs in the financial markets would be incentivised by measurable efficiencies and related cost reductions that are sufficiently large to cover the investment required for the transition to an on-chain environment; increases in safety, resilience and trust; reduction in complexity and disintermediation; by the absence of existing trading infrastructure for the asset or the existence of large inefficiencies in such markets. Wider adoption of asset tokenisation at a large scale might therefore be more easily envisaged in niche markets with limited liquidity and multiple layers of intermediation, such as SME or start-up equity and debt financing (e.g. private placement of non-listed securities/participation in private limited liability companies, small-sized issuance of bonds or the tokenisation of private equity/venture capital

funds). Some market participants, however, argue that large players active in mature markets are more technology-ready and have the know-how and capacity required to invest in the adoption of tokenisation practices faster than in niche markets for SME financing.

What is more, the OECD report argues that a potential transition of financial markets and products to a tokenised environment enabled by DLTs could more easily be envisaged to be deployed in a gradual manner, prioritising those processes that have the most potential for efficiency gains first (e.g. clearing and settlement). Tokenised markets may flourish as a complement to current conventional markets, for certain processes along the security lifecycle, such as post-trade.

What is tokenisation of assets?

Tokenisation of assets can involve the representation of pre-existing real assets (financial instruments, a basket of collateral or real assets) on the ledger by linking or embedding by convention the economic value and rights derived from these assets into digital tokens created on the blockchain; or the issuance of tokens that are “native” to the blockchain, which are built directly on-chain and live exclusively on the distributed ledger.

When it comes to financial assets, tokenisation of securities (equity and/or debt) is seen by the market as the sector with the most imminent potential for growth as it would involve the mere replacement of one technology with another; Tokenised securities could be seen as a form of cryptography-enabled dematerialised securities that are based and recorded on a decentralised ledgers powered by DLTs, instead of electronic book-entries in securities registries of central securities depositories. Tokenisation could also be considered as a proxy for a DLT-based form of asset-backed securitisation.

Figure 1. Tokenisation of real assets that exist off-the-chain

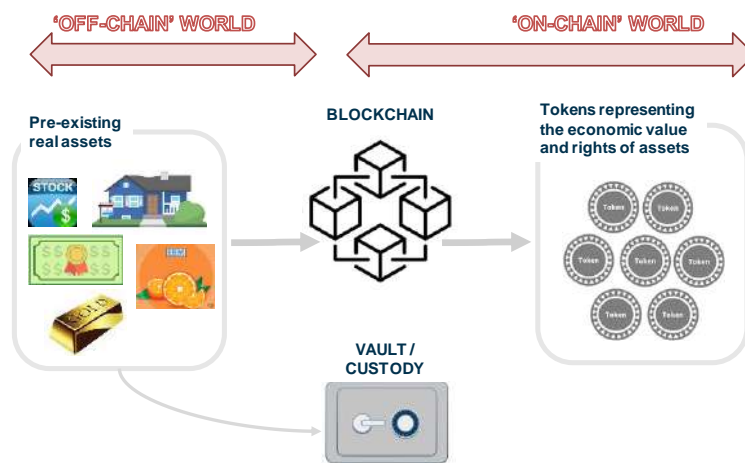
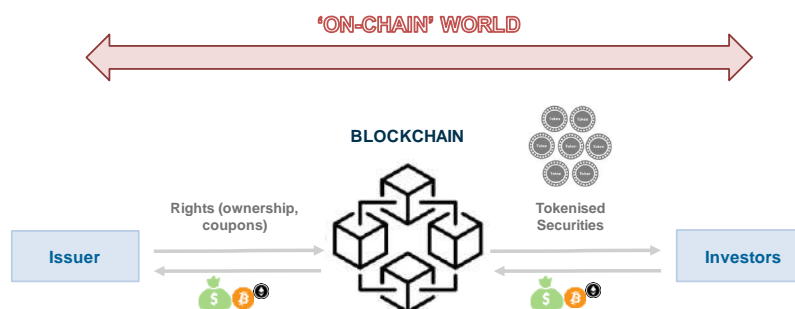


Figure 2. Tokenisation of assets “native” to the blockchain

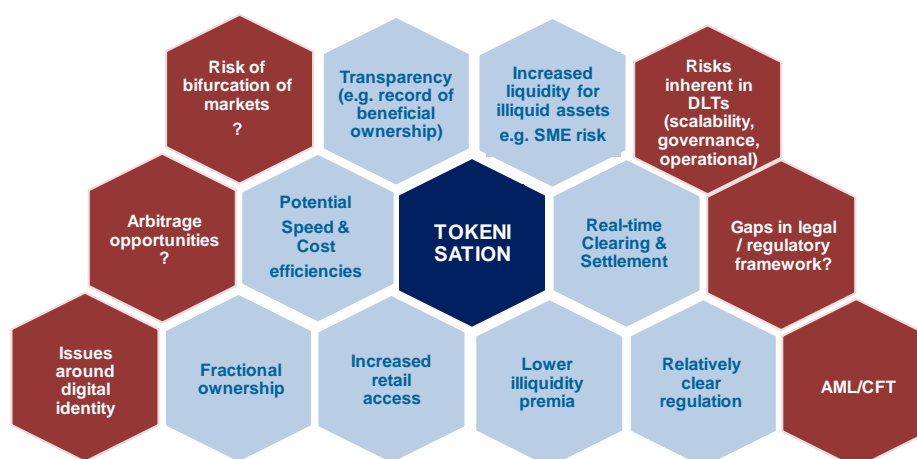


Benefits, risks and challenges to its wider adoption

The application of DLTs and smart contracts in asset tokenisation has the potential to deliver a number of *benefits* including efficiency gains driven by automation and disintermediation; transparency; improved liquidity potential and tradability of assets with near-absent liquidity; faster and potentially more efficient clearing and settlement. It allows for fractional ownership of assets which, in turn, could lower barriers to investment and promote more inclusive access of retail investors to previously unaffordable or insufficiently divisible asset classes (e.g. real estate, private placements of equity or debt), allowing global pools of capital to reach parts of the financial markets previously reserved to large investors. The flow of private financing from capital owners to SMEs could be eased and facilitated, enhancing access to financing for SMEs.

At the same time, the adoption of asset tokenisation at a large scale would face a number of *challenges* related to technology (scalability; settlement finality; interoperability; network stability; cyber-risks); governance; risks related to AML/CFT; issues around digital identity; issues around data protection and privacy; as well as around the legal status of smart contracts.

Figure 3. Benefits and risks of asset tokenisation



Potential disruptive effect of tokenisation on financial markets

The OECD report examines possible implications of a potential expansion in the use of tokenised assets for the financial markets.

Market disintermediation caused by tokenisation could affect *trading* by disrupting the market-making model, which could in turn affect volatility and liquidity of related markets, especially in times of stress. In terms of *pricing* of the assets, tokenisation could enhance transparency and has therefore the potential to reduce information asymmetries and improve the price discovery mechanism. At the same time, trading of tokenised assets risks becoming fragmented if the asset trades on non-interoperable networks and exchanges on- and off-the chain.

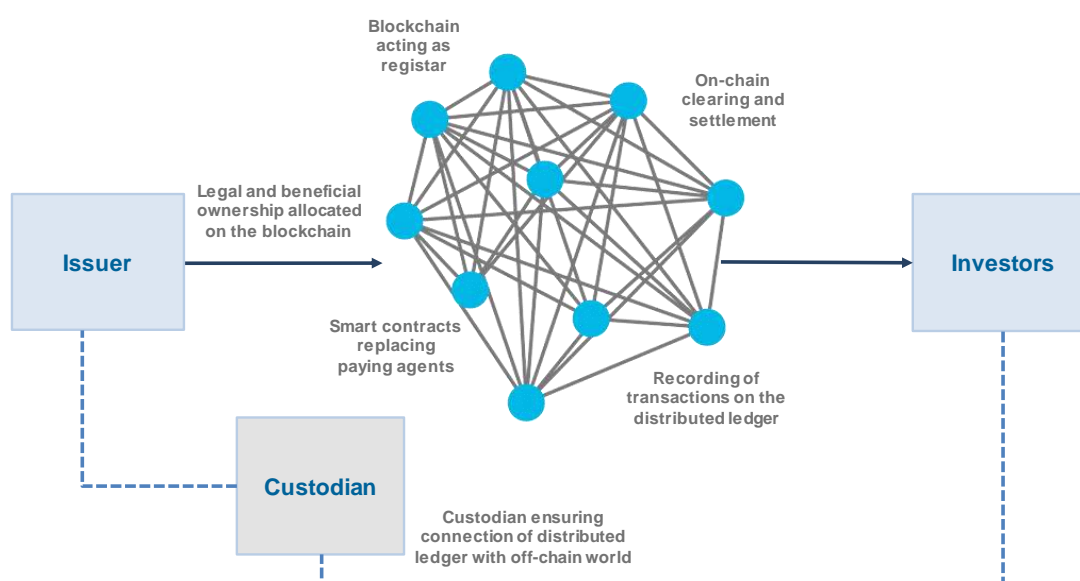
A potential take-off in tokenisation activity would also affect *repo activity* for the funding of positions, as well as *securities lending* activities used as part of trading strategies. The shift of the above activities 'on-chain' could allow for direct and faster unwinding of collateral, easier mobilisation of collateral across security pools, more efficient use of balance sheet and lower capital intensity associated with such activities. When assets and transactions of such assets are recorded on a distributed ledger, everyone has the knowledge of where the

assets sits at a specific point in time, therefore collateral could be traced and moved through different pockets in the system in a seamless way. Collateral would therefore be freed up and mobilised across securities pools sitting in different accounts and participating in the same network in a faster manner. The flipside of the above improved levels of liquidity in collateral is that no netting would longer be possible, and each transaction would probably need to be fully funded and settled. This would result in the moving of higher volume of collateral in gross terms instead of mobilising only the net collateral post netting.

When it comes to *liquidity*, the OECD report argues that tokenisation could be a double-edged sword with positive effect on near-illiquid assets (e.g. participation in the capital of private SMEs) but potential risks of bifurcation of liquidity between on-chain and off-chain markets for the same asset. The latter may result from a shift in liquidity from conventional markets on to the blockchain, drying up liquidity in the off-chain markets.

The use of DLT can expedite and condense *trade clearing and settlement* to nearly real-time, reducing counterparty risks and freeing up collateral, producing capital efficiencies for participants in the trade. The post-trade multi-step process is simplified and the back-office administrative burden is lowered significantly. Experimental application of DLTs on clearing and settlement has, however, produced mixed results and hurdles in the development of the technology will need to be overcome for the application to arrive at the stage where it can provide better performance than systems currently in use (e.g. speed, computational cost, high-volume use and technical issues involved in DLTs such as settlement finality).

Figure 4. Simplified scheme of a tokenised security issuance



Note: The above structure assumes that the technology allows the investor to retain beneficial ownership for tokens that are held by a custodian. In terms of technology, this would translate in a separate wallet address for the exercising of voting or other rights than the wallet address that holds the assets in custody. Such technology is in the early stages of its development.

A case for tokenised central bank currency or stablecoins in tokenised securities

According to the OECD report, for settlement to be achieved at near real-time and for delivery to be certain in securities transactions (Delivery versus Payment or DvP), the securities transacted and the corresponding payments need to switch ownership simultaneously. For the payment to be exchanged without the lengthy processing times or costly fees involving intermediaries off-the-chain, a tokenised form of currency on the blockchain would need to be available and used in such operations, for the payment leg of the transaction.

A potential proliferation of tokenised markets therefore raises the question of whether and how national central banks (NCBs) would be willing to facilitate the tokenisation of central bank money for use in tokenised markets, or whether such function will be instead performed by stablecoins.

As the tokenised securities are on the blockchain, the existence of a tokenised form of currency allows for certainty around delivery and near real-time settlement to become a viable and feasible proposition. In the absence of Central Bank tokenised cash outside the context of sandboxes of proof-of-concept projects, platforms offering tokenisation services use stablecoins for the payment leg of security settlement in DLT networks. Stablecoins are also used by such platforms for the payment leg when it comes to securities asset servicing and corporate actions throughout the lifecycle of the security (e.g. dividend payments). The question is therefore raised around whether and how NCBs would be willing to facilitate the tokenisation of central bank money for use in tokenised markets, or whether such function will be instead performed by stablecoins (or central bank digital currencies, if these become available).

Examples of practical applications of the above include Project Ubin and Project Jasper proof-of-concepts developed by the Monetary Authority of Singapore and the Bank of Canada respectively.

Implications for policy makers

Tokenised markets should comply with regulatory requirements that promote financial consumer and investor protection, market integrity and competition and seek to guard against build-up of systemic risks. Tokenised assets can be seen as cryptography-enabled dematerialised securities based on a DLT-enabled networks, instead of electronic book-entries in securities registries of central securities depositories, merely replacing one digital technology with another, and raising no issues in jurisdictions with a technology neutral approach to regulation.

It can, however, sometimes be difficult to know with certainty whether tokenisation falls within, or is fully captured by, the regulatory perimeter, especially given the novel nature of some new business models and processes involved. *Potential gaps* in the regulatory treatment of tokenisation may give rise to regulatory arbitrage opportunities. Existing regulation may need to apply or get tailored to *new actors* (e.g. trusted third party guaranteeing the accuracy of information at the onboarding of the asset on-chain and safeguarding the asset) and/or new requirements may be needed to be added (e.g. covering the interoperability between DLTs or the interaction or gateways linking the on-chain and off-chain environments). *New risks* that may arise from the application of DLT technologies (e.g. associated operational risks; data; digital identity) will also need to be appropriately supervised.

At the same time, the regulatory perimeter of tokenised assets that do fall within the existing regulatory regime may not be fully and correctly understood by market participants. Regulatory or legal ambiguity around asset tokenisation can create uncertainties and risks for participants in tokenisation markets and undermine their smooth functioning, with potential indirect impact on the conventional, off-chain markets. Greater clarity around the regulatory/supervisory frameworks applied to tokenised assets and markets will be a stepping stone

to their safe development and use by market participants. Cross-border transactions of tokenised assets require international cooperation to limit regulatory arbitrage and for the smooth operation of tokenised markets.

Wider use of tokenised securities raises potential financial consumer and investor protection and market conduct issues, the handling of which will be essential to safeguard investors' interests and ensure a fair and orderly market for tokenised assets. Recourse and redress in case of damage due to a technical issue, theft or non-existent real asset backing the tokenisation is only one example of such investor risk involved. Market integrity issues can arise stemming from the immaturity of the market, the potential lack of monitoring and controlling mechanisms, combined with a lack of information around tokenisation. Financial education efforts would be indispensable for the protection of investors in tokenised markets, especially given the potential for increased participation of retail investors in such markets.

References

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OECD (2019), Initial Coin Offerings (ICOs) for SME Financing www.oecd.org/finance/initial-coin-offerings-for-sme-financing.htm

This report contributes to the work of the OECD Blockchain Policy Centre which provides a global reference point for helping policy makers to address the challenges raised by blockchain and DLT and to seize the opportunities it offers for achieving policy objectives. For more information, visit www.oecd.org/daf/blockchain.