

The future of blockchain – by Adena Friedman

The post-trade landscape faces disruptive forces, but change will bring greater efficiency and transparency

Market operators are constantly seeking to harness technology for innovation. Doing so has made trading faster, cheaper, safer and more efficient. Over the next decade or so, several emerging technologies will have a significant impact on our business of which one with immense potential is blockchain.

Let's be clear from the outset, blockchain - as a distributed ledger which can create a perfect record of ownership, and allows the transfer of the securities and cash in a more frictionless way - will create disruption. It has the potential to improve efficiency across financial services, enable regulators to trace suspicious transactions in near real-time and ultimately ensure that compliance and transparency are hard-wired into the very fabric of the market.

That said, building the technology itself could end up being the easy part. Creating the legal framework and ecosystem to support the application of the technology, as well as the commercial strategy, will likely be far more challenging.

But before we try to dismiss blockchain as "striving for Nirvana", it's important to remember that there's more than \$1 billion in investment and some of the world's brightest minds already working on new opportunities for blockchain to make the financial industry more efficient and less risky. When the potential benefits are this big, the industry and the regulators will find a way to put blockchain to good use.

So what might be the greatest potential application of blockchain? It's difficult to choose among the almost limitless applications. However, the best way to determine what it will be used for first is to examine the industry's biggest pain points and what can be addressed with the least amount of new regulation. That leads us to the over-the-counter markets and bilateral contracts. Ultimately, however, it will have the most impact where it can mitigate the most risk and save the most money - the public markets.

Across the OTC markets, blockchain could significantly decrease risk and increase efficiency in swaps, bonds, commodities, unregistered securities, syndicated loans and repos and other instruments. An interesting effect of the technology that could spur support from regulators is the increased transparency that it brings. Since blockchain is ideal for tracking and tracing, it could improve auditing and regulatory reporting.

Regulators could be given access to relevant ledgers and cryptographic keys to observe transactions in near real-time and determine patterns of money moving between financial institutions. There would be none of today's time lag to hamper regulators trying to identify and act on suspicious transactions. That could translate into lower compliance costs, and with smart contracts, compliance could become a permanent market fixture.

One OTC market, the private company securities market, is dominated by heavily negotiated transactions - similar to bilateral contracts, and therefore is an excellent candidate for blockchain technology. Today, Nasdaq has deployed blockchain ledger technology to manage private company capitalisation tables. These can be quite complex as private companies raise rounds of financing, issue equity and sort out all the special terms and rights in the process. But blockchain can also facilitate the transfer and immediate settlement of shares from one owner to another, keeping all of the specific terms of the equity contract intact and legally binding upon the transfer. In the not too distant future, we will have working proofs of concepts that get closer to a public market trading environment.

There is also a powerful case for the use of blockchain to create efficiencies in the futures exchange and clearing space with negotiable commodity warehouse receipts. These documents provide proof of ownership for commodities stored in a warehouse, vault or depository. They allow the transfer of ownership without delivering the physical commodity, and importantly, they are eligible collateral for loans. By applying blockchain to tracking ownership, it will allow a more secure and faster transfer of ownership of the receipts without the need to establish third party infrastructure such as registries or depositories.

But one of the great promises of blockchain is its ultimate potential to disrupt the public markets, most notably the post-trade environment. As an immutable record of ownership, if blockchain is adopted to its fullest potential, it could create greater efficiency and

transparency in position-keeping and reconciliation. For cash-settled securities, it could accelerate the clearing and settlement time frame to T+0, significantly reducing risk in the system. Moreover, collateral could be moved around as quickly and easily as transferring money between accounts in a retail online banking application, saving time and costs for market participants. On the settlement side, blockchain could enable several services, including managing payments and cash, transferring securities, facilitating collateral and tri-party arrangements, and securities lending.

Because the public markets are an ultimate target for disruption with blockchain, market operators are beginning to make significant investment in embedding blockchain into the future of their market infrastructure. At Nasdaq, for example, we have launched a new financial framework enabling us, along with our technology clients and partners, to integrate blockchain into the full trade lifecycle, from pre-trade counterparty validation through to trade settlement and surveillance. By partnering with other exchanges and marketplaces, blockchain will become a part of the future of trading across all asset classes.

Exchanges cannot be successful in implementing blockchain into their infrastructure if they work alone. Partnership between market participants, issuers, regulators and other technology companies is essential if we are to create the entire ecosystem for change. It has already begun - with exchanges and some of the largest banks in the world working together to invest in this innovation.

Ultimately, it's better to disrupt ourselves than to wake up one day and find that we have all been disrupted.

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