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Blockchain Applications in Real Estate Finance: Mortgage Origination, Securitization and Servicing

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The Second Digital Revolution and What It Means for Institutional Investors

"I have no clue what blockchain is. I guess that's how my grandmother felt about the internet."
– Anonymous

Gordon F. Peery
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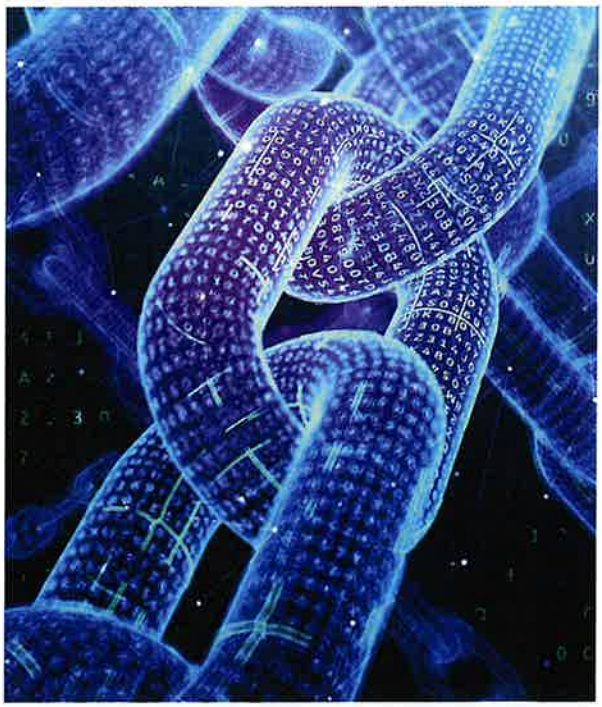
Many institutional investors and the managers who advise them view with skepticism cryptocurrencies such as bitcoin and their enabling blockchain technology, especially after the volatility and freefall in bitcoin value in the first quarter of 2018. However, words such as *cryptocurrency* and *blockchain* have become permanent additions to our investment vernacular for two reasons: financial innovation with blockchain technology has begun the transformation of global finance, and regulators appreciate this transformation yet have concerns about fraud, crime, terrorism, and the pace of the introduction and use of new payment system technologies. Just as the internet was initially met with skepticism, only to rapidly expand in the first digital revolution in the 1990s, the use of blockchain and its applications have exponentially expanded in many industries.

This article brings blockchain technology into sharper focus and illustrates how it has already begun to transform alternative investments, transactions in commodities, and real estate.



An Introduction to Blockchain

As its name suggests, blockchain is an electronic record, or ledger, made of "blocks" that store data electronically and are linked in a digital "chain." This digital ledger is accessed by a network of computers using distributed ledger technology.

The blockchain ledger is intended to be open, in that it is distributed across a network of computers, each of which has access to an electronic database and data storage system. Blockchain also serves as a platform for automated contracts between parties that execute pursuant to a protocol; these are called smart contracts, which are written in program code to automatically perform and self-execute upon the occurrence of certain conditions.[1] Blockchain can efficiently and securely store asset values and any other information relating to financial transactions using a digital code that protects the electronic information against deletion, tampering, and revision.[2]

Blockchain appeals to banks, financial services companies, and investors because it is an efficient, secure platform that, if properly constructed and accessed by transaction participants, may both streamline and expedite transactions. Forbes reported Accenture research published in 2017 supporting the premise that investment banks could save up to $12 billion annually by adopting blockchain and smart contracts.[3] Pioneers in the banking industry have successfully begun pilot programs based on blockchain to streamline transactions involving commercial real estate and commodities.

Blockchain Innovation in Financial Services

Among the early pioneers in developing blockchain technology for use in financial transactions were representatives of the "big four" banks in the Netherlands,

1. Don Tapscott and Alex Tapscott, *The Blockchain Revolution: How the Technology Behind Bitcoin Is Changing Money, Business, and the World*, Portfolio, May 2016.
2. Marco Iansiti and Karim R. Lakhani, "The Truth About Blockchain," *Harvard Business Review*, January-February 2017.
3. Roger Aitken, "Smart Contracts on the Blockchain: Can Businesses Reap the Benefits?" Forbes.com, Nov. 21, 2017.

ING Group, Rabobank, de Volksbank, and ABN AMRO Bank N.V. Partnering with IBM, ABN AMRO created a blockchain application called Torch that puts lenders, borrowers, appraisers, title registries, and government regulators involved in real estate transactions on the same digital page.

Torch developers steeped in both commercial real estate and technology expertise began with the basic premise that in traditional real estate transactions, lenders in real estate (and other transactions) go to great lengths to gather information about borrowers and the land and other collateral securing loans. ABN AMRO pointed Torch in the direction of current know-your-customer, due diligence, and transaction inefficiencies by enabling the lender, borrower, land registry, and other parties to a real estate transaction to obtain, transfer, and exchange information and transaction details (and execute contracts) in an efficient and secure way—in real time—using blockchain technology.

The Torch application operates by using a dedicated, electronic portal for transaction parties to access the blockchain, which is shared by computers operated by real estate transaction participants, each sharing the transaction information. The ABN AMRO Innovation Centre compares the blockchain to a Microsoft Word document that is shared, edited, and viewed online, not just by representatives of the lender and borrower but by all transaction participants, with each having appropriate access to certain approved blocks of data.[4] In much the same way that a conference call participant receives an invitation to a call and a password, each party in a real estate transaction has a digital key to access the blockchain. Digital keys also determine the level of access to data within the blockchain, and each block within the blockchain is securely encrypted. As the transaction proceeds, participants have to use the correct protocol to demonstrate to other parties in the working group that they have proper access to the blockchain.

Using Torch, a commercial real estate agent supplies the property and transaction information, and the applicable land registry and chamber of commerce also confirm and share property data. The economics of the property and the financing, purchase, or lease are added to the blockchain, giving the lender (as well as the Dutch central bank, which, as regulator, monitors lender valuation and commercial finance transactions)[5] an updated data set for the transaction.

ABM AMRO Innovation Centre states that because parties outside the ledger have no access to the transaction, fraud is "out of the question,"[6] making the blockchain arguably more secure than a conference call. Is blockchain security affected if a holder of a digital key shares it with an unauthorized party, which in turn takes information or attempts to make changes to the blockchain? ABN AMRO Innovation Centre addresses that by stating that "any unauthorized in-network changes are flagged by the blockchain application."[7]

Blockchain has also been used in commodity trading. Teaming with French bank Societe Generale, Dutch banking conglomerate ING Group collaborated with commodity trading house Mercuria in successfully executing and settling an oil trade using blockchain technology. In that trade, the first of its kind, ING Group and Societe Generale stated that blockchain technology provided significant benefits of speed, cost savings, and risk management. The banks predicted that the average time for a bank to complete its role in a transaction will shorten from three hours to 25 minutes.[8]

In their oil trade, ING and Societe Generale used the Easy Trading Platform, "the first comprehensive platform prototype to be developed which can be expanded and scaled across the commodity and finance domain and uses blockchain technology to overcome some of the industry's biggest challenges. Applying distributed ledger technology to the commodity trade financing chain can prevent issues such as documentary fraud and allows for the digitalisation of assets. The platform also boosts operational efficiency and quality by introducing auto-checking of documents."[9]

4. "Van A tot Z: Blockchain & Torch," ABN AMRO Innovation Centre, April 12, 2017, https://www.youtube.com/watch?v=kgRjZa1Tthc.
5. Erik Van der Kooij, "ABN AMRO Explores How Block Chain Application Torch Can Help Various Parties, Around Real Estate Transactions in the Exchange of Information," Blockchangers, Dec. 29, 2016.
6. "Van A tot Z."
7. "Van A tot Z."
8. "Compelling Results for Blockchain Oil-Trade Test ING and Societe Generale Corporate & Investment Banking," ING and Societe Generale, press release, Feb. 22, 2018.
9. "Compelling Results for Blockchain."

ABN AMRO, Louis Dreyfus Company, Shandong Bohi Industry Co., Ltd, ING, and Societe Generale also successfully completed the first agricultural commodity transaction using the Easy Trading Platform.[10]

It is entirely conceivable that notwithstanding congressional and regulatory action over the past 75 years in the area of over-the-counter and exchange-trade derivatives, blockchain will be used to make derivative trading more efficient, and an additional layer of statutory and regulatory action will follow. In late 2017, the International Swaps and Derivatives Association, Inc., published *ISDA Common Domain Model Version 1.0: Design Definition Document*, a standardized model for the representation of trade life cycle events as an early step to integrate blockchain, distributed ledger technology, and smart contracts into the management of OTC derivatives.[11] Just as the introduction of the Trade Reporting and Compliance Engine converted what was once an opaque bond market to one that is more efficient with more favorable pricing, blockchain and effective reporting and management of derivatives would also benefit the derivatives markets; blockchain- and smart contract–based innovation in the area of derivatives trading is taking place now.

Implications of Blockchain Innovation for Institutional Investors

It is not a question of *if* but *when* a second digital revolution involving blockchain will take hold throughout the financial services industry and elsewhere in the global economy. This revolution is still in its early stages but is gathering the kind of momentum evident just before widespread acceptance and use of the internet; expected consequences should be appreciated but not overstated. Perhaps with recent volatility and the freefall in bitcoin value, there was a sense that blockchain and cryptocurrencies might not be around much longer, but this is truly not the case. Today, institutional investors and their advisors can monitor laws and regulations and learn about blockchain innovations by reading white papers published in connection with securities offerings and other developments relating to blockchain, smart contracts, and virtual currencies. Institutional investors can count on a future with blockchain enabling a more streamlined and efficient process with respect to transactions and investments in real estate, securities, and the securitization of those securities as well derivatives and other investment products.

Certain traditional arrangements in real estate, securities, securitization, and other transactions may change with blockchain. As one example, escrow accounts in traditional real estate transactions may be the first to change after the introduction and use of blockchain technology.[12] ABN AMRO has developed, tested, and

10. "First Agricultural Commodity Trade Through Blockchain Completed," ABN AMRO, press release, Jan. 22, 2018.
11. *ISDA Common Domain Model Version 1.0: Design Definition Document*, ISDA.
12. Ogwu Osaemezu Emmanuel, "ABN AMRO's Blockchain Solution Aims to Eliminate Escrow Services," BTCMANAGER.com, Feb. 21, 2018.

will soon provide to the market for widescale use an alternative to traditional escrow accounts that uses blockchain.[13] With the goal of reducing transaction costs and in consultation with securities exchange Nxchange, ABN AMRO's affiliate ABN AMRO Clearing Bank can establish and maintain accounts that enable customers to buy and sell equity and debt securities on Nxchange and pay for transactions via blockchain as opposed to accessing traditional broker or escrow accounts.[14] Although access to accounts via blockchain for purposes of buying and selling securities is not currently used on a large scale, a prototype to replace escrow has moved beyond the research, development, and testing stages. This development may bring about a comprehensive rethink of how financial assets such as derivatives, as well as stocks, bonds, and other assets, are custodied in light of the benefits of blockchain.

This is not to say, however, that all other aspects of traditional investment will be replaced by blockchain-based innovations in the near term. According to Harvard Business School professors Marco Iansiti and Karim Lakhani: "True blockchain-led transformation of business and government, we believe, is still many years away. That's because blockchain is not a 'disruptive' technology, which can attack a traditional business model with a lower-cost solution and overtake incumbent firms quickly. Blockchain is a foundational technology: It has the potential to create new foundations for our economic and social systems. But while the impact will be enormous, it will take decades for blockchain to seep into our economic and social infrastructure. The process of adoption will be gradual and steady, not sudden, as waves of technological and institutional change gain momentum."[15]

Given this reality, the media continues to hype the potential for blockchain to fundamentally change the financial services industry and many other industries and facets of modern life. Notwithstanding the understandable hype, these steps are being taken: the chairs of the US Commodity Futures Trading Commission (CFTC) and Securities and Exchange Commission (SEC) recently testified to the Senate Banking Committee concerning the need for a comprehensive body of law and regulation governing financial transactions in blockchain and virtual currency, and the chair of the Banking Committee suggested in February 2018 hearings that additional regulatory authority to govern these new technologies should be given to the CFTC and SEC.[16] Policymaking and regulation may be under way to foster the growth of blockchain; the Senate Banking Committee heard testimony that blockchain might have enabled regulators to provide a more effective response on the eve of the Great Recession of 2008.[17]

Conclusion

For blockchain to gain widespread acceptance in the investment community, the work of ABN AMRO, ING Group, and other pioneers in testing and making available blockchain-based innovation needs to—and will certainly—continue, along with careful study by regulators and policymakers to determine and approve the use of payment systems and investment products based on blockchain.

Although the time line leading to acceptance of blockchain in the financial services industry is uncertain, continued innovation and the use of blockchain technology in finance—with regulation accompanying that innovation—are a certainty. ■

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13. Tanya Andreasyan, "Nxchange Pioneers ABN AMRO's Blockchain Tech for Escrow Accounts," FinTech Futures, Feb. 16, 2018.
14. "ABN AMRO Launches Blockchain Bank Accounts to Kill Escrow Accounts," CCN.com, Feb. 17, 2018.
15. Iansiti and Lakhani, "The Truth About Blockchain."
16. Ted Knutson, "Regulators May Need More Power to Control Bitcoin, Senate Banking Chair Says," Forbes.com, Feb. 6, 2018.
17. Knutson, "Regulators May Need."

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