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Blockchain Technology: Preparing for Change

04

In Short

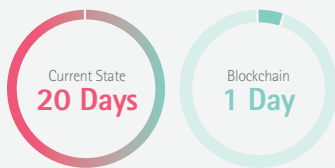
Blockchain-related Venture Capital

**\$392.86
million**

in 2015 funding through July

Settlement Days

Syndicated Loans



Adoption Timeline

2015

EXPLORATION & INVESTMENT

2016–2017

EARLY ADOPTION

2018–2024

GROWTH

2025

MATURITY

Platforms, such as the Internet, have radically altered front-office functions for investment banks, bringing unprecedented efficiency gains and new business opportunities. Yet, despite advancements over the past 20 years, middle- and back-office functions remain mostly antiquated, slow and not very efficient. Here, firms are still dealing with overly complex procedures involving multiple counterparties, manual processes and third-party service providers.

During the past year, blockchain technology has rapidly gained traction in the capital markets industry as one of the most exciting technological developments in recent history. In surveying the global financial technology sector, Accenture has identified blockchains as “possibly the biggest opportunity from taking an open approach to innovation”. This technology has the potential to help minimize counterparty risk, reduce settlement times, improve contractual term performance and increase transparency for regulatory reporting.

Recognizing the possibilities, some banks and venture capitalists have begun leveraging their financial assets by investing in blockchain technology—both directly and indirectly with stakes in existing start-ups, including research and development labs (see Figure 1). Others are asking themselves if this technology can really transform the capital markets ecosystem and ultimately optimize middle- and back-office functions—and, if so, how they can prepare for that future.

Figure 1: Blockchain-related venture capital

Year	Funding (\$M)
2015	\$392.86 YTD
2014	\$361.53
2013	\$95.05
2012	\$2.13
Total	\$851.57

Notes: Figures reflect only publicly disclosed funding. Where a range was given, the lowest value was used. Companies that provided insufficient funding round details (e.g., no guidance on the amount of funding raised) were excluded. The 2015 amount is as of July 2015.

Source: <http://www.coindesk.com/bitcoin-venture-capital/>

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What is blockchain technology?

Blockchain is a disruptive technology platform that uses cryptography and a distributed messaging protocol to create shared ledgers among counterparties. Originally, blockchain technology was used by cryptocurrencies whose popularity gave rise to the idea of blockchains as a means of building consensus. Since then, banks have begun exploring ways to apply blockchain technology to payments. In the context of capital markets, blockchain-distributed ledgers enable open-source, decentralized, replicated, shared and cryptographically secure operations that are validated by mass collaboration and can be applied to many financial instruments.

Unlike traditional ledgers in banks, which use central authorities to manage transactions (see Figure 2), distributed ledgers built on blockchains validate transactions through a protocol managed by the user community via a consensus mechanism (see Figure 3). This decentralized approach changes the power dynamic within the financial system, shifting power from institutions to users.

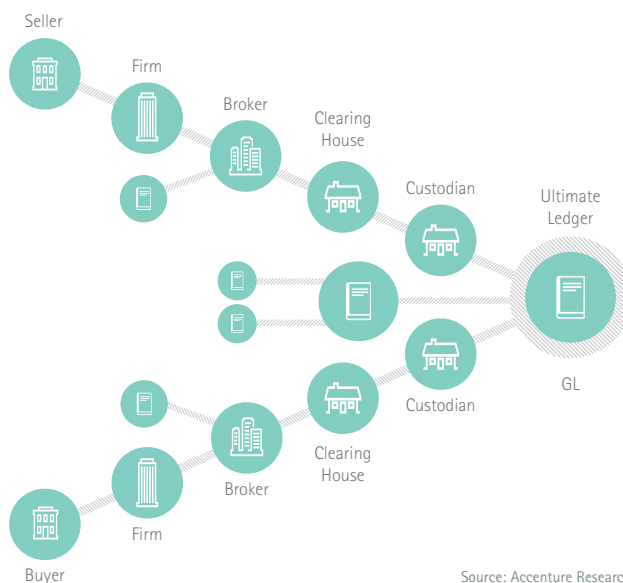
Asset transfers can be facilitated without third-party intermediaries through the use of “smart contracts”—programmed code that replicates conventional commercial agreements by digitizing business transactions between parties and validating them through a blockchain. Practically speaking, this means blockchain-enabled networks have the potential to increase trading efficiency, improve regulatory control and eliminate unnecessary intermediaries.

In which situations does blockchain technology make sense?

Blockchains are most valuable when:

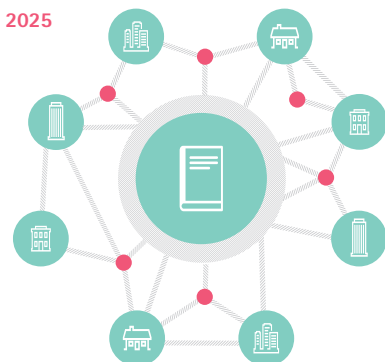
- **They are used to keep track of complex things.** For example, a swap with multiple parties that has been sold and resold and moved between custodians is often problematic in a traditional back office, but a distributed ledger can accommodate various players. A similar result can be achieved with a properly designed database, but the ledger eliminates power struggles and ensures there is no single point of failure.

Figure 2: Capital markets today



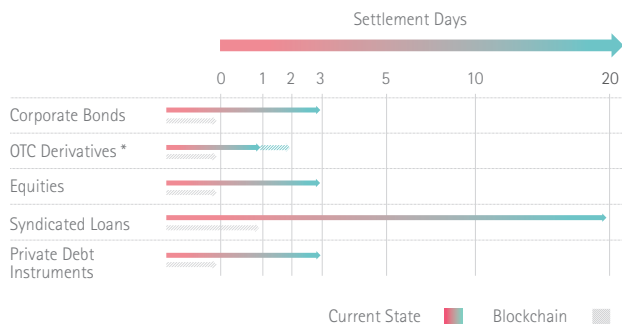
Source: Accenture Research

Figure 3: Capital markets in 2025



Source: Accenture Research

Settlement Days



* ISDA best practices guideline
Source: Accenture Research

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Blockchain's well-defined, programmatic interface makes it possible for the front office to interact directly with the ledger, simplifying reconciliations and the trade process more generally.

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- **There is no well-established authority in place.** Examples include syndicated loans, fixed-income, currency and commodity (FICC) derivatives, private equity, and bilateral over-the-counter transactions.
- **Transactions involve finite or countable resources.** A blockchain-enabled distributed ledger makes it possible to track assets in ways that are not possible with a traditional distributed database.
- **A cryptographic audit trail is required.** Examples include financial accounting and regulatory reporting exercises.

How can blockchains help investment banks?

Though still in the early stages, market players have begun exploring how blockchains can help investment banks. Blockchains can be used to:

- **Reduce total cost of ownership.** Blockchain stacks offer a robust and verifiable alternative to traditional proprietary stacks at a fraction of the cost.
- **Manage system-of-record sharing.** Blockchain technology makes it possible to give various parties (e.g., clients, custodians and regulators) access to their own live copies of a shared system of record.
- **Clear and settle transactions faster.** Blockchain technology can facilitate the transition from overnight batch processing to intra-day clearing and settlement.
- **Create self-describing electronic transactions.** Smart contracts can use blockchain's programming language to create context-aware transactions for complex arbitration. For example, a credit default swap could pay out automatically according to pre-agreed logic that watches market data feeds.

Let's take a closer look at the trade and post-trade areas, for example. Blockchain's well-defined, programmatic interface makes it possible for the front office to interact directly with the ledger, simplifying reconciliations and the trade process more generally. The back-office systems likely have their own application program interfaces (APIs), perhaps across different systems. With the adoption of a distributed ledger, you have a unified vision that encompasses the trade capture process. It's a bit like putting the back office in the front office, with the blockchain or distributed ledger acting as a self-clearing, self-settling system for the front office to work on directly.

In some respects, a blockchain or distributed ledger can act as a clearinghouse, albeit with some important caveats. Specifically, a blockchain cannot act as a central counterparty; it does not have skin in the game in the same way that a centralized clearinghouse does—just yet. In all other ways, a blockchain functions as a central clearinghouse, registering and tracking obligations from different parties. A blockchain or distributed ledger offers other advantages too, including vastly reduced counterparty risk and shorter settlement times, which in turn improve balance sheet efficiency.



What's the catch?

Because blockchain technology is a relatively new concept for the capital markets industry, it is a source of both excitement and confusion. Sometimes the terms "blockchain" and "Bitcoin" are used interchangeably—a common error among those unfamiliar with the technology's background. Although the Bitcoin protocol is built on blockchain technology, it is just one type of distributed ledger. A number of solution providers are attempting to build capital markets applications using the Bitcoin protocol; however, other forms of distributed ledgers might be better options for the industry.

Choice of protocol aside, the use of blockchain technology in capital markets raises a number of unanswered questions in three key areas:

Legal: How will legal authorities treat automated contracts and digital assets transferred through blockchain technology? Can ownership of non-cryptocurrency financial assets be transferred using the distributed ledger concept with certainty and finality? Will counterparties need to be identifiable and linked to a legal entity? How will a legal framework accommodate both smart and traditional contracts?

Operational: How will assets be transferred between traditional and blockchain-enabled ledgers? Is a smart contract capable of enshrining and executing all event functions across an asset's lifecycle? What role will oracles play in ensuring the proper execution of smart contracts? What happens as new parameters potentially impact contracts? How can ever-expanding ledgers be stored cost-effectively?

Regulatory: When will regulatory authorities outline acceptable and best practices for using blockchain-enabled distributed ledgers? Will regulators treat traditional and blockchain asset transfers differently? How will blockchain technology affect regulatory reporting requirements? Will a distributed ledger transaction history suffice for auditing purposes?

Getting started

Many firms are in an exploratory phase, testing out the technology in their own technology labs and innovation centers (see Figure 4). Despite numerous technical and regulatory uncertainties, blockchain technology has many possible applications in capital markets. For example, suggested use cases in testing mode today may include Know Your Customer/Anti-Money Laundering (KYC/AML) data-sharing, trade surveillance, regulatory reporting, collateral management, trading, settlement and clearing.

Firms that want to assess the viability of blockchain technology for specific financial instruments, such as syndicated loans, should consider a number of factors, such as anticipated reduction in settlement days, current clearing and settlement costs, digitization potential, product volume, cost of capital avoided and implementation costs. The next step is to clearly identify risks and challenges. Only then should a firm begin developing a detailed blockchain roadmap, determining product and asset class adoption and creating an implementation schedule.

Overall, we see today an intermediary stage in the overall development of blockchain, with investment banks running private (permissioned) blockchain solutions until such time as regulation or legislation catches up to the technology, and capital markets are confident in the types of services they can offer. Ultimately the ability to settle currency, equity, and fixed income trades almost instantaneously through permissioned distributed ledgers may create an even greater opportunity for banks to drive efficiency and potentially create new asset classes. In the meantime, banks should consider which asset classes would benefit most in the near term based on clearing and settlement challenges, explore the technology closely, and engage with one another in test cases to create blockchain-enabled distributed ledgers.

Figure 4: What does adoption look like?

2015

Exploration & Investment

- Initial capability & use case assessments
- Early adoption likely for internal reconciliation

2016–2017

Early Adoption

- Leading-edge banks see the value of blockchain and begin deployments for asset classes that are bilaterally traded and/or have no central clearing authority
- Regulatory certainty drives adoption for external uses
- Regulatory authorities realize the benefits of blockchain for auditing and compliance, and rule-making begins

2018–2024

Growth

- Banks begin to see the benefits accorded to early adopters and – combined with regulatory guidance and certainty – the network effect takes hold
- New service providers and models emerge
- Deployments go viral across numerous asset classes
- New products and services are created; incumbent processes and services are discarded

2025

Maturity

- Blockchain adoption is considered mainstream and integral to the capital markets ecosystem

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Contact Us

To discuss any of the ideas presented in this paper, please contact:

David Treat

New York
david.b.treat@accenture.com

Laurie McGraw

Philadelphia
laurie.a.mcgraw@accenture.com

Claus Helbing

Frankfurt
claus.helbing@accenture.com

Chris Brodersen

New York
c.brodersen@accenture.com



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