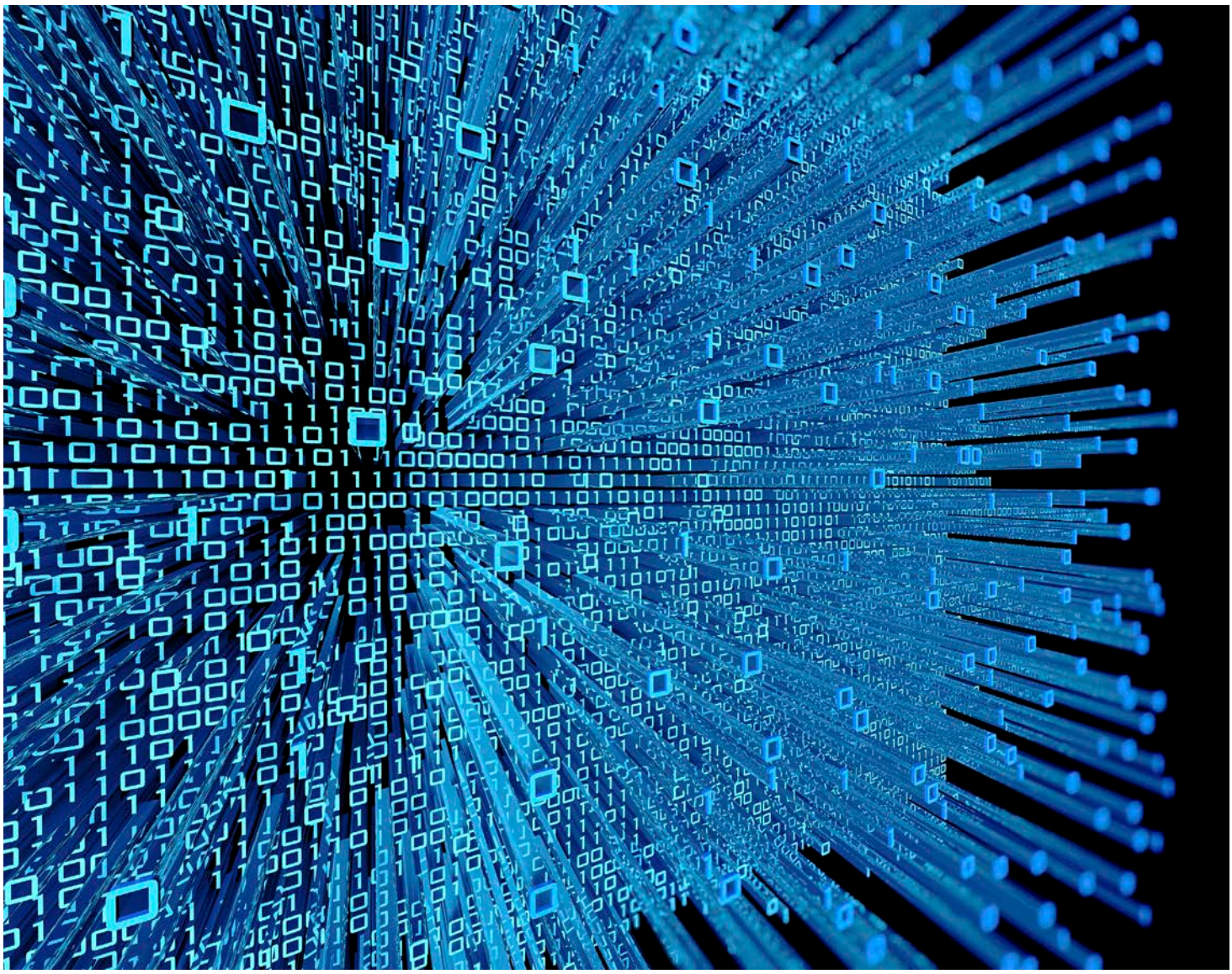
Bitcoin, the Blockchain and Their Impact on Institutional Capital Markets



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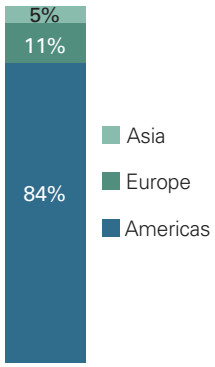
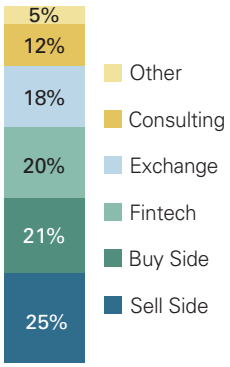
RESEARCH GOALS AND METHODOLOGY

Between May and June of 2015, Greenwich Associates interviewed 102 financial professionals to determine the level of awareness and understanding of distributed digital ledger technologies among institutional financial services firms.

Respondent Profile by Region



Respondent Profile by Type



Note: May not total 100% due to rounding

Cover Photo ©istockphoto.com/Devrimb

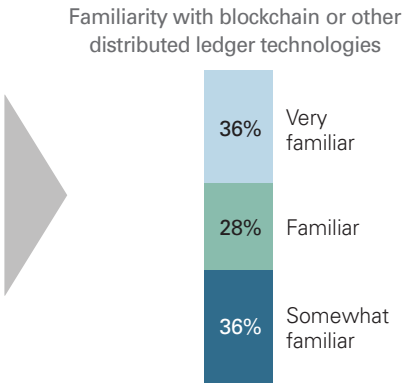
Bitcoin and the blockchain grew up together. Thus far, Bitcoin has received the bulk of the attention, with its no-central-authority approach to currency. In line with this trend, nearly all of the more than 100 institutional capital markets professionals interviewed for this study confirmed their familiarity with Bitcoin.

The idea of a currency not controlled by a central government, or anyone at all for that matter, is certainly revolutionary. It is not Bitcoin itself that has the potential for changing the institutional capital markets, however. The blockchain, the technology that allows Bitcoin to exist and be transferred safely without an intermediary, presents a much bigger opportunity for financial services firms.

Familiarity with Distributed Ledger Technologies

91%
of respondents were familiar with Bitcoin

70%
were familiar with blockchain or other distributed ledger technologies



Note: Based on 102 respondents in 2015. Source: Greenwich Associates 2015 Bitcoin, Blockchain and the Capital Markets Study

Seven out of 10 capital markets professionals are familiar with the blockchain, more broadly known as distributed ledger technology, which is noticeably lower than those confirming their awareness of Bitcoin. Of that 70%, only about a third are very familiar with distributed ledger technology. Actual understanding on Wall Street is likely even lower than that, as those with no awareness of Bitcoin or the blockchain likely refrained from participating in this study. But we firmly believe Wall Street's knowledge of blockchain is expanding rapidly.

The potential applications of blockchain-style distributed ledgers in the institutional capital markets are many, and when coupled with a number of high-profile new ventures, awareness in the coming year is going to skyrocket—a trend we hope to support with this and forthcoming Greenwich Associates research.

Blockchain 101 for the Capital Markets

Digital ledgers record transaction information, just like their paper ancestors. This is not a new concept. You could use Excel as a digital ledger, for instance. Most if not all digital ledger technology used in the past was owned and operated by a central party. Maybe that's your family's computer running personal finance software, an enterprise technology company settling futures trades or a global bank managing bilateral derivatives transactions. Regardless of the owner and the size of the transactions being recorded, a single entity must be in charge of the ledger and its underlying technology to ensure accuracy and security.

This is where the blockchain is different. Bitcoin lore credits Satoshi Nakamoto as the brainchild of Bitcoin and the blockchain. His thesis explains how a distributed digital ledger can be created that allows a new currency to exist with no central oversight of either the currency or the ledger. While it's hard to argue that these ideas were born out of libertarian doctrine (i.e., we don't want the government controlling the flow of money), the current incarnation is primarily capitalist.

The design of the network ensures that a digital asset cannot be spent twice or used by someone that doesn't own that asset—a concept best explained by analogous technology examples. In the late 1990s, Napster allowed anyone with an internet connection to download a copy of nearly any song or album for free, and then make their music library available for others to do the same. There was no central store of music, but instead thousands of personal computers around the world making their music libraries freely available. The asset, a song in this case, could be easily copied and redistributed.

Eventually Apple's iTunes came on the scene and legalized digital music distribution. It was still possible to download most any song or album, but now it would cost you, and Apple was in control. What does this have to do with the blockchain? Think of the blockchain as Napster with the controls of iTunes—no central store of information or controller of how it

THE BIRTH OF BITCOIN

We have proposed a system for electronic transactions without relying on trust. We started with the usual framework of coins made from digital signatures, which provides strong control of ownership, but is incomplete without a way to prevent double-spending. To solve this, we proposed a peer-to-peer network using proof-of-work to record a public history of transactions that quickly becomes computationally impractical for an attacker to change if honest nodes control a majority of CPU power. The network is robust in its unstructured simplicity. Nodes work all at once with little coordination. They do not need to be identified, since messages are not routed to any particular place and only need to be delivered on a best effort basis. Nodes can leave and rejoin the network at will, accepting the proof-of-work chain as proof of what happened while they were gone. They vote with their CPU power, expressing their acceptance of valid blocks by working on extending them and rejecting invalid blocks by refusing to work on them. Any needed rules and incentives can be enforced with this consensus mechanism.

–Satoshi Nakamoto, 2008
Bitcoin: A Peer-to-Peer Electronic Cash System

flows, but rules that keep transactions above board and assets unique. The millions of computers around the world running blockchain technology all work collectively to ensure the network remains honest and operates without interruption.

Why, then, are millions of computers (and their owners) willing to provide their CPU and electricity to keep the blockchain running? The answer is simple: Bitcoin. By acting as virtual notaries via crunching the numbers needed to keep the blockchain secure, it is possible to acquire Bitcoins. This process is referred to as mining. What is important to understand in this context is that the security created via mining acts as the incentive people need to be involved in the blockchain network. No incentive, no blockchain.

A Risk Reducer?

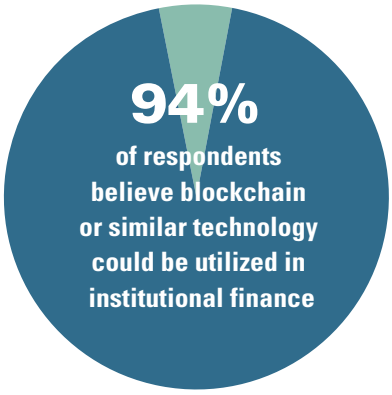
What we've just explained is a technology that allows millions of participants in a market to transact with one another with no middleman, but with confidence and security kept intact. While the public blockchain exists for and because of Bitcoin, many in the financial markets believe the blockchain and/or the underlying technology can be used for much more. As such, 94% of our research participants believe that the blockchain or similar distributed ledger technology could be utilized in institutional finance.

Risk reduction tops the list of benefits expected from distributed ledger usage in the capital markets. Among those, settlement, counterparty and custodial risk are seen as the most likely benefactors.

Settlement is essentially the transfer of ownership. For a cash equities trade, for instance, settlement is when the securities are moved from the seller to the buyer once a cash payment is made in the opposite direction. For securities and exchange-traded products, this process is handled by an intermediary. The blockchain today handles this process for Bitcoin with no intermediary. The same process could work for any asset, assuming a legal framework is in place to support it—a big assumption at this point. The simplicity of the blockchain settlement process would in theory limit the risk of settlement failure.

Using the blockchain could not only in theory reduce settlement risk but also speed up settlement, a belief that comes with many caveats. While the two counterparties to the trade will know of the trade

Distributed Ledger Use in Institutional Finance



Note: Based on 68 respondents in 2015. Source: Greenwich Associates 2015 Bitcoin, Blockchain and the Capital Markets Study

immediately, Bitcoin transactions settled via the blockchain take at least 10 minutes to be validated, and can take as long as 24 hours. It is after this validation time gap that each counterparty, both anonymous to one another, can feel comfortable that the transaction will stand the test of time.

When compared to the current T+3 process in U.S. equities, that's fast but far from instantaneous. Creating a private blockchain, one using the same technology but outside of the public blockchain used for Bitcoin, could enable considerably faster settlement and verification of transactions. But moving from the public to a private blockchain creates other concerns—something we will examine closely in a forthcoming report.

Lastly, custodial risk goes right back to the core of why the blockchain was created in the first place—to cut out the middleman. Trillions of dollars are transferred successfully each day by dozens of custodians around the world, so clearly the process works. Conversely, many of those processes were built decades ago with levels of automation that leave a lot to be desired in 2015.

Markets Ripe for Disruption

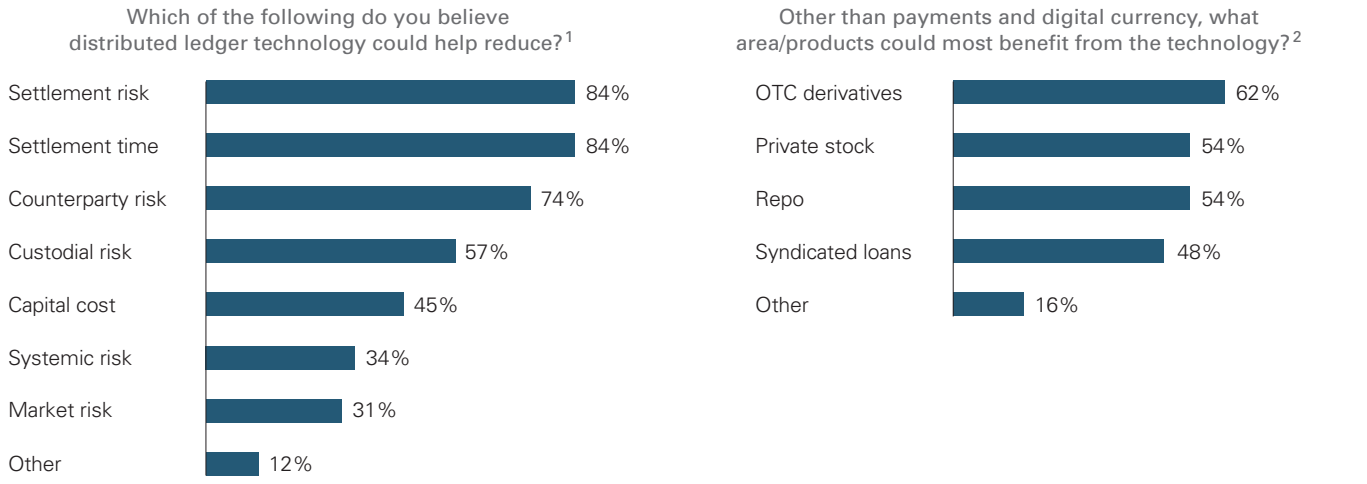
OTC derivatives, private stock, repo and loan markets were cited as the most likely asset categories to benefit from distributed ledger technology in the medium term, with a focus on the processes just discussed. Looking only at the non-cleared portion of the OTC derivatives market, all are bilaterally traded markets with a patchwork of technology and processes in place to ensure trades are cleared and settled correctly.

While more established markets like U.S. equities could stand to benefit from the blockchain approach (thinking particularly about how long it is taking to move from T+3 to T+2 settlement), those financial products where automation is still limited are most likely to see quick adoption. It is easier to build from scratch than to replace legacy technology and processes.

From that perspective, Greenwich Associates believes that the leveraged/syndicated loan market is a strong first-use case, as is the market for private stock (especially given Nasdaq is already going down this path). These are products with growing demand but very limited infrastructure. Our research shows that investor trading of both par loans and CLOs grew considerably in the past year, for instance, yet a monthlong settlement cycle is common and often includes the use of a fax machine. For a market so obviously in need of technology, it makes sense to implement improvements with the latest tools and approaches available—blockchain.

Conversely, products like U.S. equities and cleared derivatives could also, in theory, trade and settle via the blockchain. However, the public blockchain isn't now suited to handle the high transaction volumes seen in these markets. Furthermore, those markets are so large and the processes and players so well

Distributed Ledger Technology Benefits



Note: [1]Based on 58 respondents in 2015. [2]Based on 61 respondents in 2015. Source: Greenwich Associates 2015 Bitcoin, Blockchain and the Capital Markets Study

Current and Future Use of Distributed Ledger Technology

Note: Based on 92 respondents for "currently use" and 87 "reviewing" in 2015. Source: Greenwich Associates 2015 Bitcoin, Blockchain and the Capital Markets Study

understood and entrenched that the value proposition for making what would be a multibillion dollar change isn't quite there yet.

Again, limited infrastructure is easier to replace than extensive and well-entrenched infrastructure. These are markets that certainly need to see their transaction processing mechanisms improve as the markets evolve, but a big-bang conversion from a well established process to a still-emerging technology isn't going to happen.

Most are Watching, a Few Have Jumped In

While the first big blockchain success in capital markets is still uncertain, eventual acceptance feels all but guaranteed. Nearly half those firms we spoke with are actively investigating blockchain and related distributed ledger technology. The conversations we conducted for this study left us surprised how advanced the thinking was among a variety of both large, established market participants and new entrants (the majority founded by long-time industry veterans).

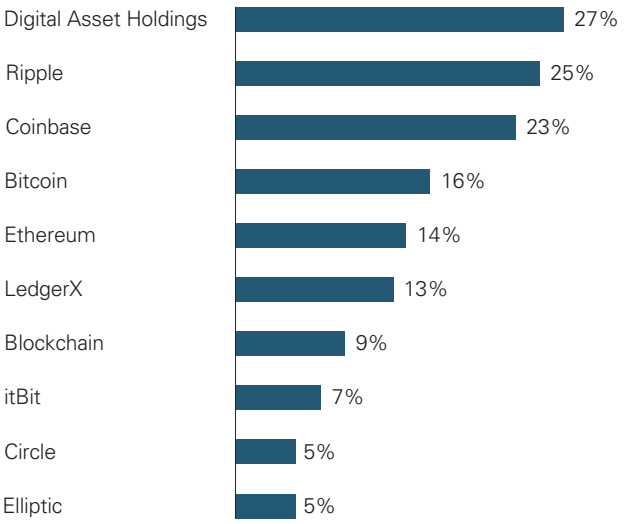
Only 17% said they were actually using distributed ledger technology today within their firm, including exchanges, buy side, one sell side and technology providers. We believe actual adoption in capital markets is quite a bit lower, given those participating in this study are more informed and engaged in this debate than most. But today's limited adoption, coupled with the time and money being spent to determine the path forward, all but guarantees usage statistics will jump significantly by the end of 2015.

Whom to Watch, and What's Next

Blame it all on the financial crisis. The near collapse of the global banking system likely played a big part in Nakamoto's creation of Bitcoin and the blockchain. It also drove the financial services sector to look for more efficient ways of doing business, mostly via innovative technology. Those two factors combined could result in a major long-term change in the way transactions large and small are processed.

Blockchain/Bitcoin solution providers are many. Our research participants identified nearly 50 firms focused in some way, shape or form on the blockchain/Bitcoin ecosystem, with the top 10 shown here.

Familiarity with Distributed Ledger Technologies/Companies



Note: Based on 56 respondents in 2015. Source: Greenwich Associates 2015 Bitcoin, Blockchain and the Capital Markets Study

A large number of providers are focused on growing the use of Bitcoin as a currency. These include those that provide Bitcoin wallets, such as Coinbase and a smaller number of Bitcoin exchanges. The exchange category includes both those for Bitcoin itself, such as itBit and, more interestingly for institutional markets, those hoping to grow the use of regulated Bitcoin derivatives such as LedgerX.

The other big category includes firms looking to use blockchain technology to drive the transfer of assets other than Bitcoin. Some are more focused on retail money transfer, like Circle and Ripple, while others specialize in institutional asset transfers, like Digital Asset and Symbiont.

In an effort to provide clarity into what's out there, we've put these firms into a limited number of finite buckets. The underlying solutions are more nuanced than those buckets imply, however, with most evolving as quickly as the dialog around Bitcoin, blockchain and their promise to revolutionize finance.

A number of hotly debated questions remain unanswered regarding capital markets' adoption of distributed ledger technology. Can Bitcoin and the blockchain be separated effectively? Can private blockchains operate without losing the benefit of the public blockchain? Can other technology solve the same problems just as effectively? We will address these questions and others in detail in a forthcoming Greenwich Report.

Greenwich Associates is committed to providing the market with the information needed to make effective decisions regarding these questions and the many others that are emerging as the distributed ledger disruption continues. ■

Methodology

Between May and June of 2015, Greenwich Associates interviewed 102 financial professionals to determine the level of awareness and understanding of distributed digital ledger technologies among institutional financial services firms.

The data reported in this document reflect solely the views reported to Greenwich Associates by the research participants. Interviewees may be asked about their use of and demand for financial products and services and about investment practices in relevant financial markets. Greenwich Associates compiles the data received, conducts statistical analysis and reviews for presentation purposes in order to produce the final results. Unless otherwise indicated, any opinions or market observations made are strictly our own.

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