

2023 New Value Report

Crypto Trends in Business & Beyond



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About Ripple

Ripple is a crypto solutions company that transforms how the world moves, manages and tokenizes value. Ripple's financial solutions are faster, more transparent, and more cost effective - solving inefficiencies that have long defined the status quo. And together with partners and the larger developer community, we identify use cases where crypto technology will inspire new business models and create opportunity for more people. With every solution, we're realizing a more sustainable global economy and planet - increasing access to inclusive and scalable financial systems while leveraging carbon neutral technology and a green digital asset, XRP. This is how we deliver on our mission to build crypto solutions for a world without economic borders.

Learn more about Ripple at ripple.com.



Introduction

There is no question that 2022 was a momentous year in the world of crypto and blockchain. As a collective industry, crypto experienced it all—the good, the bad and the ugly.

And as with any burgeoning technology, the only constant is change, with crypto being no exception. Key drivers of that change include shifting global economies and supply chains; the rise and fall of stablecoins like Terra; the collapse of exchanges like FTX, cryptocurrency hedge funds like Three Arrows Capital, and (more recently) major banks like SVB and Credit Suisse. We would be remiss not to think these events would have a significant impact on the industry at large, or to not address them head on in our research and in this report.

While 2022 was one of the more difficult years in crypto's short history, and 2023 appears to be off to a similarly rocky start for the broader financial sector, that doesn't appear to have shaken global confidence in the underlying technology. In fact, our research shows quite the opposite,

with positive sentiment toward crypto and blockchain having actually increased over the past 6 months (more on that later).

So, in looking at crypto through a broader lens, we see that change is also being driven by growing consumer demand and interest in blockchain and digital asset technology, maturing use cases for financial institutions and businesses, and a broader shift toward real-world utility. And despite all the recent market turbulence, global finance leaders are still very optimistic. As the market recovers and continues to mature and evolve, so too will the applications of crypto and blockchain technology.

This report focuses on the extent to which global finance leaders are aware of, interested in, and exploring crypto as



a utility tool and how it's driving real business value for financial institutions, enterprises and their customers across: decentralized finance (DeFi); tokenization and non-fungible tokens (NFTs), central bank digital currencies (CBDCs); payments; custody; and compliance. We also go a level deeper to explore not only the real value they're providing right now, but more and more how and why these technologies are beginning to merge together to provide holistic, interoperable solutions that will have deep, long-term impact.

The global finance landscape continues to shift and evolve, ultimately heading towards a world where value moves as seamlessly as information does today—what we call the Internet of Value. As the past year has shown us, it's now more important than ever for global enterprises and financial institutions to be able to identify, define and demystify primary topics, trends and technologies to help pave the way forward for partners, customers and the industry at large.

As such, this report provides not only an overview of those concepts which are top of mind for leaders at financial institutions and enterprises worldwide, but also what primary problems and pain points those technologies can solve across key use cases. This is by no means meant to be an exhaustive list, but rather a guiding light for companies and financial institutions looking to understand the everyday business value that crypto can provide. Because, as it turns out, the real building with crypto is still happening. In fact, it's only just beginning.

In keeping with the theme of our inaugural 2022 New Value Report, this year's version is also divided into sections as they relate to the **Internet of Value: Tokenize, Manage and Move**.



Tokenize

establishes the digital representation of value on the blockchain

Manage

wields tokenized value through actions such as holding, hedging, staking, lending, borrowing and more

Move

sends value from one place, person or organization to another ("payments")



Blockchain and Crypto Sentiment and Perspectives

Summary of key findings:

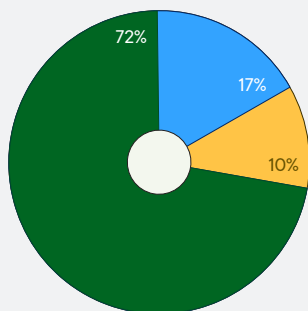
Global Finance Leaders are Confident in Crypto, Digital Assets and Blockchain

Over the past 6 months, finance leaders' confidence in the crypto industry has...

Increased

Remained the same

Decreased



79% of all respondents are either very or extremely confident when it comes to integrating cryptocurrency solutions for their business

NA

81%

EMEA

72%

LATAM

88%

MENA

87%

APAC

75%

Over the past 12 months, finance leaders' confidence in using cryptocurrency solutions for their business has...

Significantly increased

26%

Somewhat increased

39%

Remained the same

21%

Somewhat decreased

9%

Significantly decreased

5%

Crypto elicits overwhelmingly positive feelings for global finance professionals

Excited/confident

48%

Optimistic

29%

Curious

11%

Uncertain or skeptical

7%

Pessimistic, scornful, or fearful

3%

And anticipate big impacts from the technology

Over 90% of global finance leaders think blockchain and digital assets will have a significant or massive impact on business, finance and society in the next 3 years

Industries and segments where finance leaders see cryptocurrency having the biggest impact in the next 3 years:

Digital Banking/Fintech

37%

PSP or 3rd Party Aggregator

32%

Technology

31%

Retail Banking & Commercial Banking

28%

Money Transmitter or Payment Provider

27%



Summary of Findings

Big Picture

Overall, Latin America (LATAM) is more bullish on enterprise and institutional use of crypto for business followed by the Middle East and North Africa (MENA), then North America (NA), Asia Pacific (APAC) and Europe, Middle East and Africa (EMEA).

The vast majority of global finance decision makers (upwards of 88%) believe that crypto and blockchain will have either a significant or massive impact on business, finance, and society over the next three years.

Over half of global respondents cite already having a cryptocurrency solution in place at their company, or are in the process of implementing one. Upwards of three-quarters indicate an openness to using or exploring other crypto technologies over the next few years (e.g. CBDCs, stablecoins, NFTs, etc.)

Not only does our research show that the vast majority of global finance leaders have confidence in crypto, but those who have the most experience or expertise with the technology are even more optimistic after using or implementing a crypto solution.

While each technology offers its own unique benefits, some core themes are woven throughout. Benefits that emerge across many of these technologies include: enhanced data security and privacy, improved automation and speed, financial flexibility and availability, and the ability to tap into new revenue streams or market opportunities.

Despite the general positivity, uncertainty and barriers to adoption like privacy concerns, lack of clear regulation, risk management and price volatility are still present.

Tokenized Assets

Most decision makers in this space are anticipating tokenized assets like CBDCs, stablecoins, NFTs, etc. to have meaningful impacts across business, finance, society, and specific use cases or industries.

Compared to last year, respondents expect greater impact from CBDCs and stablecoins in less time.

Cross-border payments and consumer-to-business payments are the top two most highly ranked use cases for both CBDCs and stablecoins.

Enterprises are particularly bullish on the use of NFTs for business in the metaverse and events/ticketing.

Over 80% of global finance leaders are somewhat or very likely to use cryptocurrencies, CBDCs and/or stablecoins in their business in the next three years.

Finance leaders are more confident in cryptocurrencies to meet their business needs than they are traditional currency.

Portfolios, Payments & Capital

Ease of use is far and away the most important requirement for organizations to enable customers to pay with crypto.

Faster payments/settlement times and cost savings are the biggest value propositions for incorporating crypto into cross-border payments for enterprises and payments/treasury professionals at financial institutions—regardless of region and level of familiarity with crypto.

Top reasons to hold a cryptocurrency are for use as a currency for making payments, and for use as a hedge against inflation.



Interest rates and cost-related concerns are key blockers for borrowing, raising capital, and making cross-border payments.

Perspectives and Sentiment

Even in light of recent events and press about the crypto landscape, there are many clear indicators to signal that favorability toward, and confidence in, the industry has not been shaken in the long run. This suggests that any uncertainty was influenced by a few bad actors as opposed to the underlying technologies themselves.

Two-thirds of respondents say their confidence in cryptocurrency solutions for business has increased over the past 12 months.

Nearly three-quarters say their confidence in the broader crypto industry has increased over the past six months.

Crypto elicits an overwhelmingly positive emotional response, with 77% of finance decision makers feeling either excited, optimistic, or confident.

Sustainability

Sustainability is top of mind for global finance leaders, particularly in the context of cryptocurrency usage for those at financial institutions.

But it's not a key consideration for companies when selecting a crypto technology.

A Note on Methodology

The findings in this report are based on a number of inputs. More details on primary research methodologies can be found in the endnotes.

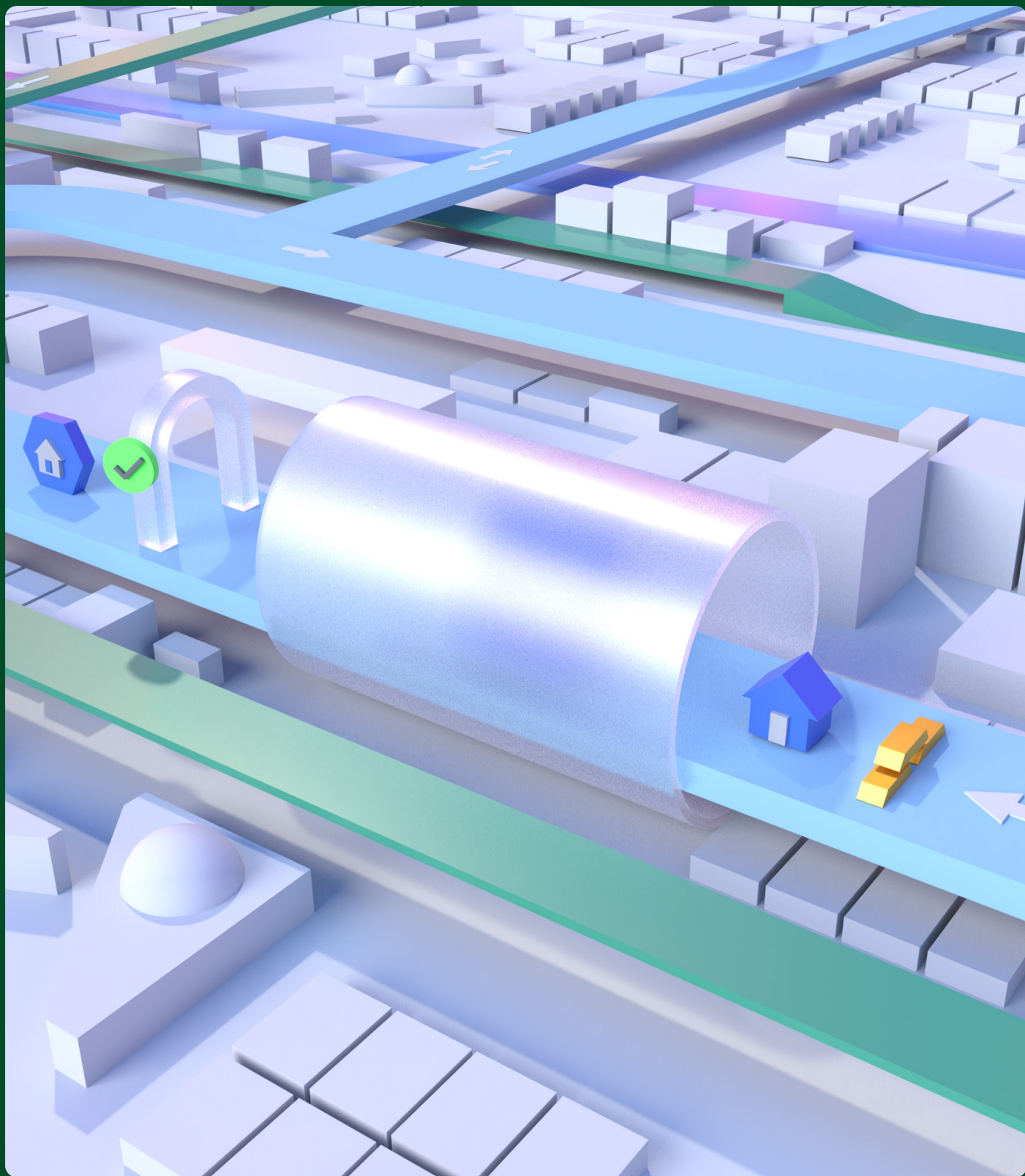
- Primary research conducted globally in January 2023 surveying 869 finance leaders in Financial Institutions and 850 finance leaders in Enterprises across 14 countries
- Secondary research gathering published insights from industry experts
- Our own daily, global experience working with institutions and governments that are leveraging blockchain and/or blockchain-driven digital assets

A Note on Terminology

Throughout this study we will use the term "financial institution" to distinguish businesses of all sizes such as banks, fintechs, payments providers, and others. We will use the term "enterprises" as a way of identifying companies that do not fall within the broader financial institution/financial services scope. We will also use the terms "individual" or "consumer" as a way of differentiating between organizations such as enterprises, financial institutions, governments, etc.

Definitions for survey terminology:

- **Crypto** is used to encompass cryptocurrencies such as Bitcoin, Ethereum and XRP, as well as other digital asset types like CBDCs and stablecoins, NFTs, etc.
- **Cryptocurrency users** are defined as those survey respondents who already have a cryptocurrency solution in production or are in the process of implementing one at their business. **Non-users** are defined as those who are piloting a proof-of-concept, researching, or not currently considering a cryptocurrency solution.
- **Digital asset services** are defined as third-party platforms or solutions that enable customers to share, buy, sell and otherwise manage digital assets such as CBDCs, stablecoins, tokens, cryptocurrencies, etc.



Section

Tokenize



Tokens, or digital assets, are digital representations of value on the blockchain.

In essence, anything can be tokenized, including but not limited to: currencies such as CBDCs and stablecoins; real world assets (liquid or illiquid) like carbon credits, stocks, real estate and gold; art and collectibles, intellectual property and access rights (e.g. tickets), and more.

Key benefits of tokenization on a blockchain include:

- Fast, efficient transactions in 24/7/365 markets
- Transparent transaction data and decentralized security
- Streamlined capital flows and improved settlement times
- New borrowing/lending markets via DeFi
- Increased customer engagement, brand loyalty and financial inclusion through fractionalized ownership
- Improved liquidity and the ability to create multi-tier pricing structures
- On-chain compliance processes linked to a digital wallet and/or digital identity

As more and more assets are tokenized, and additional use cases for tokenization continue to be explored, tested and developed beyond the simple JPEG, we are bullish on their future and broader business impact.

We're not alone in this sentiment. In fact, Boston Consulting Group (BCG) estimates the tokenization of global illiquid assets to be a \$16 trillion business opportunity by 2030¹. Bloomberg estimates there's roughly \$4 trillion locked in private equity and real estate². Real world assets like stocks, bonds, real estate, and others can be tokenized on blockchains with improved efficiencies over traditional market infrastructure. Tokenizing previously illiquid asset classes like these opens up not only a whole new world of global investment and trading using DeFi protocols, but also solves problems related to slow settlement times, high fees, manual processes and dividends, lack of transparency and liquidity, cumbersome intermediaries, fragmented and lengthy processes.

With real-world assets represented on-chain, atomic settlement (i.e. instant access exchange) means faster settlement with less risk for assets like government bonds, and quicker asset turnover for improved operational efficiency and increased revenue. These are just a couple of the many tokenization examples that are laying the foundational building blocks of institutional DeFi (covered in the next section), and spurring excitement among global institutions.

Bringing financial markets and assets on-chain is quickly moving from hype to reality. According to a survey of global institutional clients commissioned by BNY Mellon and conducted by Celent, 97% agree that tokenization will revolutionize asset management and be good for the industry³. They also found that 88% of investors are comfortable utilizing a digital representation of currency like stablecoins or tokens.

Data from our research further supports this notion. When asked about levels of confidence in tokenized assets (CBDCs, stablecoins, and cryptocurrencies) compared to traditional currency (also known as fiat) to meet their business needs, interestingly enough, respondents selected either "very" or "extremely" confident almost evenly across the board. So in spite of the year that crypto had in 2022, confidence in the technology has not seemed to wane too much, especially considering traditional currency actually ranked lower than cryptocurrencies.

The majority (72%) of finance decision makers expect to explore tokenization as a way to drive innovation over the next three years, especially those at financial institutions who currently have or are in the process of implementing a cryptocurrency solution at their organization.

In business opportunity by 2030 for tokenized assets



Tokenization Will Drive Greater Global Innovation

Summary of key findings:

Finance decision makers expect to explore tokenization as a way to drive innovation over the next three years

Assets that would benefit the most from tokenization

63%

Online security/data protection tools

50%

Stocks

NFTs are anticipated to have meaningful impacts across a variety of use cases

- For financial institutions: public stock trading (82%) and private share trading (82%)
- For enterprises: metaverse (67%) and access to events/experiences (51%)

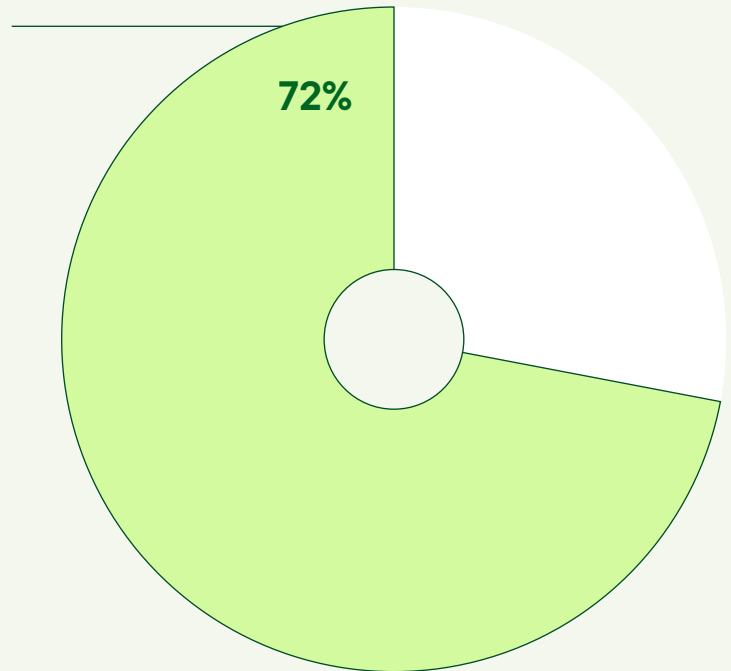
And afford many benefits for enterprises and financial institutions alike

Top benefits of tokenization:

- Access to 24/7/365 markets
- Greater financial agility and flexibility
- Enhanced security and privacy
- Improved efficiency and automation

Top benefits of CBDCs and stablecoins:

- Better data management
- Security
- Stability/longevity



Expected usage is high in the near future

80+%

of global finance leaders are likely to begin using cryptocurrencies, CBDCs and/or stablecoins in their business in the next 3 years

Confidence is highest in cryptocurrencies to meet business needs compared to traditional currencies, CBDCs and stablecoins





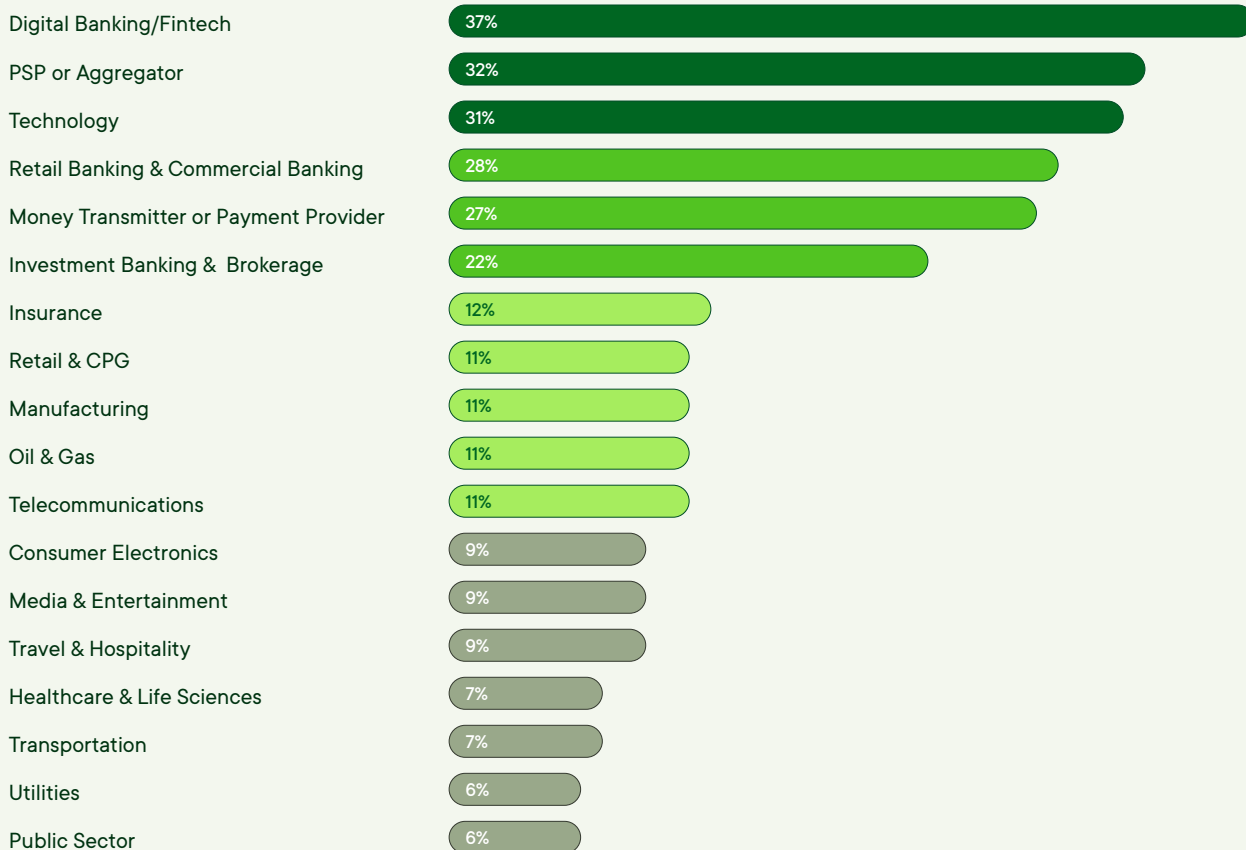
Not only does our research show that the vast majority of global finance leaders have confidence in the industry, but those who have the most experience or expertise with the technology are even more optimistic after using or implementing a cryptocurrency solution.

Finance leaders at enterprises in particular see this innovation happening across a number of industries, primarily those within financial services.

This year, we're focusing on two main areas within tokenization that we foresee as having the most real-world impact across businesses, financial institutions and their customers: NFTs for business and CBDCs.

FIGURE 01

Enterprise finance leaders see cryptocurrency having the biggest impact on finance and technology





NFTs for Business

Despite the 2022 downfall and what many assumed to be a temporary fad, NFTs are still totaling close to \$500 million in monthly sales volume⁴. In Q1 2023 alone, the NFT market experienced a 137% increase in trading volume, and had a total of 19.4 million NFT sales⁵. Not only is there ample market opportunity, but also endless business opportunity for companies to take advantage of these tokenized assets. This is true across a variety of use cases; from media and entertainment, to carbon markets, real estate, gaming, loyalty and rewards, and beyond.

In fact, some of the world's best-known brands are using NFTs as their entry point into web3*, including the likes of Tiffany & Co, Nike and Budweiser⁶. Starbucks is also joining the web3 movement through the launch of their new NFT loyalty program as a way to promote the brand, improve customer engagement and experience. By offering members the ability to buy digital collectible stamps that are minted as NFTs on a blockchain, consumers are granted

access to new, immersive experiences and online communities, and in turn increase loyalty and dedication to the brand. Not only is Starbucks able to leverage the technology to engage with their customers in new, meaningful, innovative ways, but customers are also able to better connect with each other and be part of a community of other brand loyalists.

Another area of business innovation using NFTs is related to the tokenization of real estate (i.e. mortgages.) In February 2022, a home in Tampa, Florida was recorded as the first in the U.S. to be sold as an NFT on a blockchain, facilitated by the web3 property technology company Propy⁷. Companies like Propy are leveraging the power of blockchain for easier, faster and more secure real estate transactions, resulting in powerful advantages for both businesses and consumers. By solving real-world problems in the real estate industry around process efficiency and transparency of ownership confirmation, interested buyers can quickly and easily view prior owners, tax records, pricing history, etc. on an

CRYPTO CONCEPTUALIZED:

Fractional Ownership of Real Estate with NFTs

Homebase, a crypto startup, tokenized a single-family rental property in McAllen, Texas on the Solana blockchain and real estate investors purchased the NFT for \$246,800⁸. The home was tokenized on Solana via a smart contract tied to an NFT. Because Solana supports the stablecoin USD Coin (USDC), this enabled fractionalized ownership of the property among various real estate investors, where users could quickly and easily purchase a portion of the property's value in a single click.

Fractional ownership of real estate via NFTs is driving greater financial inclusion by making property ownership and equity stakes more affordable and accessible for more people. Real estate tokenization projects are bringing more players into the market, more assets on-chain (including Solana, XRP Ledger, Ethereum and others) to increase liquidity, and simplifying the home buying, selling and renting process with secure, verifiable transactions, automated processes, and fewer intermediaries.



* The next iteration of the World Wide Web which incorporates open-source, decentralized applications and token-based economies powered by blockchain. Web1 was the first and earliest form of the internet, and web2 was the next evolution with emphasis on user-generated content and participation (e.g. social media, podcasts, blogs, etc.)



immutable ledger. And real estate agencies and property management companies are able to generate more demand for the listed home. In the case of the house in Florida, for example (which sold for approximately 210 ethereum), the online auction for the NFT drew nearly 3,000 bidders.

While use cases like these are driving real-world utility and real business value, we wanted to explore whether or not finance leaders at financial institutions and enterprises understand the value that tokenization can bring to businesses. If so, what are the use cases they see as being the most important and impactful for their business? And if not, why and what does the industry need to do to remove those hurdles?

Use Cases and Impact

As mentioned above, we see the tokenization of real-world assets (or RWAs) as one of the most important, enduring use cases for tokenization. It appears that finance leaders at both financial institutions and enterprises hold similar sentiment (the former slightly more so). When asked about the biggest areas of impact of tokenization over the next three years, we learned that decision makers anticipate the

most massive impact on public stock trading and private share trading—particularly those with cryptocurrency experience in MENA.

Across the board, expectations are high for tokenized RWAs, with securitized assets, commodities, real estate, public bonds, private debt, derivatives markets and carbon markets following closely behind by one or two percentage points.

Among the enterprise audience, the metaverse and ticketing are the top use cases for utility-based NFTs. The business use of NFTs across both instances is primarily around secure, tamper-proof, transparent records of ownership and a means of bridging physical and digital experiences and transactions. Indeed, the expected amount of NFT-related metaverse transactions is estimated to increase from 24 million in 2022 to 40 million by 2027⁹.

FIGURE 02

Perceived Enterprise Use Cases For Functional NFTs Over the Next 3 Years

Metaverse

67%

Access to events and experiences (ticketing)

51%

Loyalty rewards programs

47%

Gaming

46%

IP access rights

40%

I don't think functional NFTs will have any impact

3%



Generally speaking, our study found that financial institutions appear to be more interested in tokenization for their business compared to the enterprise audience. 83% said they were extremely or very interested with 11% currently exploring or using tokenization in their business, vs. 66% and 8% for the enterprise audience, respectively.

Benefits

Perhaps unsurprisingly, given other findings around the importance of privacy and security considerations for digital assets, over 60% of financial institutions and commercial audiences think that online identity and data protection tools (e.g. antivirus software or SIM cards) would benefit the most from tokenization, followed by stocks at 50%. And only 2% of respondents stated that their business wouldn't benefit from the tokenization of any asset.

So, it's clear that financial leaders around the world realize the benefits that tokenization has to offer. In fact, in its most recent report Citi predicts the tokenization of

financial and RWAs as blockchain's killer use case, with an estimated growth factor of 80x in private markets and \$4 trillion of value by 2030¹⁰.

Where the data from our study gets really interesting is how these tokenized assets would benefit the business. While the cited benefits of each tokenized asset shift and vary slightly, there are consistencies among the top four benefits and the bottom three across the board. In other words, regardless of which asset is tokenized, respondents expect access to 24/7/365 markets, greater financial agility and flexibility, enhanced security and privacy, and improved efficiency and automation.

We wanted to find out first-hand what benefits, if any, global finance leaders at both financial institutions and enterprises think NFTs specifically can bring to their business. Almost half (47%) foresee the benefit of new revenue opportunities, followed closely by the ability to better manage their data (i.e. improved visibility, traceability, and control) at 45%. When we compare these results to those for tokenization more broadly, we actually see that global finance leaders rank NFTs slightly higher, where tokenization in general is seen as providing better operational efficiencies.

The most massive impact?

Public stock trading and private share trading

When asked about the biggest areas of impact of tokenization over the next three years, we learned that finance decision makers anticipate the most massive impact on public stock trading and private share trading—particularly those with cryptocurrency experience in MENA.





Barriers to adoption

As with any nascent technology, there are barriers to more widespread institutional adoption. While we did learn that the majority of respondents are likely to explore tokenization in the next three years, we also learned that many of those same respondents—those at enterprises, and in roles related to digital transformation, blockchain/cryptocurrency, and innovation at financial institutions in particular—have concerns around security and lack of regulation.

This isn't surprising given the rollercoaster ride that tokenized assets have been on for the past year. The lack of clear regulation in the US and other jurisdictions around digital assets and cryptocurrency only further fragments an already-complicated, patchwork landscape that companies are expected to navigate.

CBDCs and Stablecoins

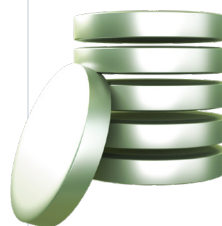
According to McKinsey, roughly 90% of the world's central banks are now pursuing CBDC projects¹¹, up from 80% last year. Additionally, Juniper Research forecasts the value of payments via CBDCs to reach \$213 billion annually by 2030, up from just \$100 million in 2023, representing a massive 260,000% growth rate¹². Analysts attribute this growth to declining cash usage, increasing demand for privately issued digital assets, central banks' desires to not get left behind in the race to innovation, and the rise in local governance amidst a global payments landscape.

With widespread access and distribution capabilities the promise of CBDCs to promote financial inclusion, enable fiscal and monetary policy, and economic growth has central bankers around the world piloting use cases. Over 120 countries large and small are now exploring CBDCs at varying stages of development. This represents over half of the world's countries and more than 95% of total GDP. China is the furthest along with their digital yuan, or eCNY, with other exploratory projects like a digital euro, digital pound, digital rupee and digital dollar (among many others) also ongoing. Citi estimates as much as \$5 trillion worth of CBDCs in various currencies circulating throughout major economies over the next decade¹³.

Where CBDCs are digital currencies issued and managed by the government, stablecoins (in many cases) are issued and managed by private entities rather than created, controlled or regulated by a country's central bank. Because stablecoins are pegged to a major currency, for example the US dollar, they usually have little-to-no volatility (hence the name) beyond the volatility of the currency they are pegged to. This also means stablecoin demand remains high even during market fluctuations¹⁴.

Stablecoin adoption has been on the rise over the past few years. In 2021, 13% of crypto payments made on BitPay (a Bitcoin Payment Service Provider) used stablecoins like Tether. And total circulating stablecoin supply grew from \$29.38 billion in January 2021 to over \$182.14 billion by March 31, 2022¹⁵.

The Block Research's 2023 Digital Asset Outlook report points to stablecoins finding product-market fit and institutional adoption, with overall usage setting new records in 2022. Annual stablecoin adjusted transaction volume (i.e. a payment flow from one address to another on a public blockchain) crossed \$7.2 trillion in 2022, 19% YoY volume growth¹⁶.



\$7.2T

Annual stablecoin adjusted transaction volume
in 2022



In fact, fiat-backed stablecoins are considered one of the more successful tokenization use cases outside of cryptocurrencies, since they typically serve as base assets for most trading pairs on centralized exchanges (CEX). Stablecoins pegged to USD have seen the most traction to-date. According to The Block, the largest group of non-USD stablecoins is euro-pegged, with a market cap of €581 million (~\$605 million USD)¹⁷. That's in comparison to a \$145B+ total market cap of all fiat-backed stablecoins¹⁸. That being said, stablecoins pegged to other fiat currencies will continue to gain adoption in the coming years as regulatory frameworks continue to materialize, particularly in Europe, Latin America and Asia.

It's clear that CBDCs and stablecoins are finding their foothold in the industry, but what's driving that innovation? And how are central bankers and other finance leaders preparing for a digital currency future? In our study, we explored the current state of adoption and level of

understanding around CBDCs and stablecoins, the biggest perceived benefits, and largest barriers to adoption.

Perceived Impact and Adoption Plans

Global finance decision makers predict CBDCs and stablecoins will have a massive impact across business, finance and society. This sentiment is particularly strong among those with cryptocurrency experience, and those based in the LATAM and MENA regions. While impact ranked high across the board, those in compliance and treasury roles were a bit more conservative in their estimates.

Comparing these results to last year's survey, we see that not only do more respondents expect significant or massive impact of digital currency on business, finance and society, but they expect this to happen within a shorter period of time. In other words, impact from these digital currency technologies is and will continue to accelerate at a faster clip.

FIGURE 03

Perceived Impacts Over Next 3 Years

● Non-Existent ● Insignificant ● Significant ● Massive

in percentages %

Impact on business



Impact on finance



Impact on society





Specifically, respondents appear particularly bullish on the overall impact of digital currencies on payments. Nearly half (46%) of all respondents think stablecoins will have the largest impact on cross-border payments, and anticipate the largest impact of CBDCs to be on consumer-to-business payments (39% of financial institutions) and cross-border payments (41% of enterprises).

Many are either somewhat or very likely to begin using cryptocurrencies, CBDCs or stablecoins in their business in the next three years, and are confident that the technologies can meet their business needs. Again, we see respondents in LATAM and MENA ranking slightly higher than those in other regions, and particularly those decision makers at financial institutions who work in roles related to digital transformation, blockchain/cryptocurrency, and innovation.

Despite all of the issues that digital currencies have faced over the past year, and the fact that it's still a relatively new technology, respondents are still roughly as confident in CBDCs or stablecoins to meet their business needs as they are in traditional and trusted fiat currencies. In fact, in the case of popular cryptocurrencies like BTC, ETH, XRP, etc. respondents are actually more confident in their ability to meet business needs compared to traditional fiat (paper and coins) currency. This is likely due to the fact that well-known cryptocurrencies like BTC, ETH and XRP are already in widespread use, whereas CBDCs and stablecoins are much newer applications of digital currency technology and still largely being piloted.

Global finance leaders are more confident in cryptocurrencies to meet their business needs compared to traditional fiat currencies.

FIGURE 04

Confidence in CBDCs, Stablecoins and Cryptocurrencies to Meet Business Needs

● Not at all ● Somewhat ● Moderately ● Very ● Extremely

in percentages %





Given the likelihood of near-term adoption, we were curious what the key attributes or determining factors would be for organizations to implement a CBDC, stablecoin, or cryptocurrency solution in their business. Finance decision makers are especially interested in these technologies for their inherent security and stability. They are more apt to choose CBDCs for AML/KYC, and stablecoins and cryptocurrencies for their perceived ease of use. Since CBDCs are controlled and issued by the government, they must meet the high security standards and compliance requirements of the issuing central bank. And stablecoins and cryptocurrencies are much more widely used today, and therefore likely perceived as more familiar and user-friendly.

Other important attributes included widespread use by business and customers, liquidity, privacy (particularly for stablecoins), and sustainability.

Use Cases

Beyond just as a digital form of a national currency, CBDCs can support a variety of use cases thanks to their underlying blockchain technology, programming capabilities, and ability to reach anyone with a mobile phone and digital wallet (including the unbanked). Use cases span cross-border payments to micropayments (think reading a paywalled article or watching a single video without ads); to peer-to-peer (P2P) lending and government issued relief spending. And because they represent digital forms of national (i.e. fiat) currency, we believe they are poised to have an extremely powerful impact on economies the world over—particularly those countries where the current payments infrastructure is ripe for innovation.

Indeed, our study confirms similar findings, with cross-border payments and consumer-to-business payments being the top two most cited use cases for both CBDCs and stablecoins.

FIGURE 05

Payments Use Cases for CBDCs and Stablecoins

● Top 3 most frequently selected responses in each column

Totals	CBDCs	Stablecoins
Cross-border payments	37%	46%
Consumer-to-business payments	35%	44%
Wholesale	34%	N/A
Treasury management	30%	35%
Retail	30%	N/A
Consumer peer-to-peer payments	29%	40%
Cross-border remittances	29%	38%
Government-to-citizen payments	28%	30%
Vendor / supplier payments	27%	39%



One current example of this is the partnership between the Federal Reserve Bank of New York and Monetary Authority of Singapore to explore how a wholesale CBDC could improve the speed and efficiency of cross-border payments involving multiple currencies¹⁹.

While there is clear demand and enthusiasm around CBDCs for cross-border payments, Juniper Research anticipates domestic payments challenges will be the first to be addressed by initial CBDC pilots and their issuing central banks—with an estimated 92% of total CBDC transaction value paid domestically by 2030²⁰. Once those systems have been established locally, then the wider payments ecosystem and cross-border payments networks will benefit, but not without foresight and proper planning.

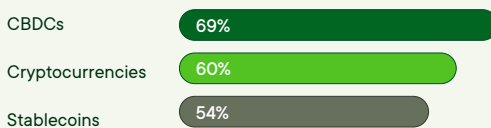
As BIS points out, even though there are various models in which CBDCs can be designed for domestic and cross-border payments²¹, a certain level of interoperability will be required among systems, ecosystem participants, and governance in order for any single solution to scale. Governments should take into account these considerations when designing a CBDC to ensure the necessary infrastructure, and that their CBDC is fit for purpose to support cross-border transactions.

When exploring which digital currency respondents would use for different payments-related use cases, CBDCs ranked highest across the board compared to stablecoins, or cryptocurrencies like BTC, ETH, XRP, Binance Coin, Litecoin, Cardano, Lumens. This makes sense given the

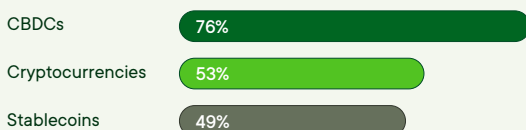
FIGURE 06

Payments Use Cases Where Finance Leaders Plan to Use Crypto

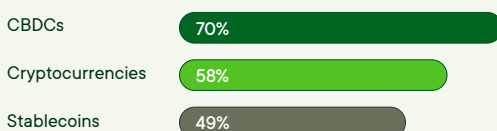
Accepting payment in the form of crypto



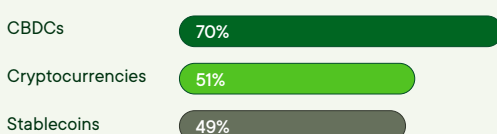
Payroll and distribution (i.e. paying employees in crypto)



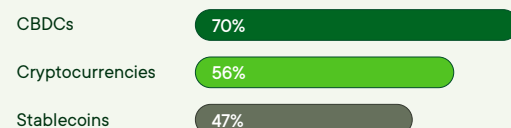
Accepting payment in the form of crypto



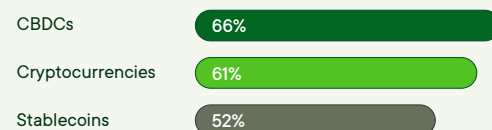
Making domestic payments in the form of crypto



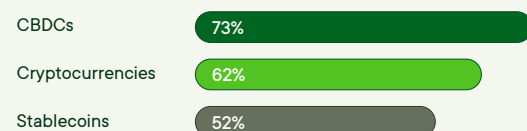
Making cross-border payments in crypto



Enabling customers to make crypto payments



Enabling customers to accept crypto payments





trusted nature of institutional banking partners with legally backed reserves, insurance protections and established relationships, so of course respondents would be more apt to leverage currencies backed by their country's central bank.

However, we were surprised to see that respondents are more likely to use cryptocurrencies than stablecoins across all use cases—particularly when accepting payment in the form of crypto and enabling customers to pay with crypto.

Even though this question was asked in the context of assuming all these technologies were available in their respective countries, it's worth noting that respondents are likely more familiar with cryptocurrencies than CBDCs and stablecoins, and already have experience using them. We did see that those who have cryptocurrency experience are more likely to use all three technologies than those without cryptocurrency experience.

Benefits

Finance decision makers, particularly those at financial institutions, expect CBDCs and stablecoins to enhance data management capabilities, i.e. visibility, traceability, and control. Additional cited benefits include the ability to create new revenue opportunities and improve operational efficiency. For stablecoins specifically, respondents see equal value in the technology's ability to give their company a competitive edge.

Thanks to accelerated transaction times, CBDCs also afford many benefits to citizens and end-users when it comes to disbursement of funds or aid, and much more efficient payments in remote parts of the world. They offer the ability to extend even the most basic financial services to historically underserved populations by way of mobile phones and digital wallets. That's because lower income users or those that have been underserved by traditional banking will only need an internet connection (e.g. through

“

Finance leaders' own words about their confidence in whether CBDCs can meet their business needs...



Reasons why they are **HIGHLY** confident

Among those who are extremely or very confident

“Central Bank Digital Currencies are being adopted by many businesses... and widely used across the world.”

Financial Institution, United Kingdom

“Central Bank Digital Currencies can ease my business needs because it makes it easier to carry out cross-border consumer-to-consumer payments, and transactions within businesses.”

Financial Institution, United States

“As Central bank digital currencies have lower transaction costs than physical currency, they are more cost-efficient than physical cash so these currencies meet our business needs.”

Financial Institution, Argentina



Reasons why they are **LESS** confident

Among those who are moderately, slightly, or not at all confident

“Once major American and European banking institutions adopt Central Bank Digital Currencies, then I will be more confident in them.”

Enterprise, United States

“Concerned about government control.”

Financial Institution, United States

”



their mobile phone) to gain access to more affordable financial services, and new participants can be brought into the market including new starter banks, fintechs, and the unbanked.

Barriers to Adoption

Many financial institutions have compliance-related concerns about CBDCs, which center primarily around privacy considerations pertaining to decentralized transactions. Almost 70% of respondents at financial institutions are extremely or very concerned about CBDCs as they pertain to compliance, with privacy (i.e. moving funds or transacting via a decentralized blockchain) ranked as the number one compliance-related concern. Those in roles related to digital transformation, blockchain/cryptocurrency or innovation were actually more likely to express compliance-related concerns surrounding CBDCs than those in more traditional financial roles like payments, treasury, capital markets, or institutional banking.

Privacy is and should be a key consideration for the implementation of CBDCs as it is with any government or public sector project involving personal citizen information. The degree of privacy, reasons for it, and prioritization can vary significantly between jurisdictions. Similar to existing financial systems, this is a comprehensive legal process that balances consumer privacy and illicit activity prevention. CBDCs should not be designed to give governments access to all consumer data, and neither do most governments want to take on that burden. Responsible CBDC design choices (e.g. employing messaging layers) may give the government the tools it needs to ensure illicit activity isn't occurring.

The right underlying technology can enable central banks to ensure both privacy and cybersecurity are embedded in the digital currency's design.

While still powered by the XRP Ledger (a decentralized blockchain), Ripple's CBDC Platform is built on a new

“

Finance leaders' own words about their confidence in whether stablecoins can meet their business needs...



Reasons why they are **HIGHLY** confident

Among those who are extremely or very confident

“It will help us **make payments more secure**, give us an upper hand over our competitors, and generate lower costs.”

Enterprise, India

“It is a common medium of exchange that can be **easily used in cross-border transactions** to make them faster and cheaper.”

Financial Institution, Singapore

“A stablecoin can be **more useful and lower risk** than other cryptocurrencies.”

Financial Institution, Japan



Reasons why they are **LESS** confident

Among those who are moderately, slightly, or not at all confident

“Stablecoins aren't commonly used, so **most of our customers won't understand it.**”

Financial Institution, South Africa

”



private ledger underpinned by the XRPL's core technology. This enables central banks to issue their currency in a secure, controlled environment, while still benefiting from the inherent advantages of blockchain technology (fast, affordable and sustainable, to name a few).

Barriers to stablecoin adoption may revolve around their perceived risk for enterprise and retail users. Currently, there aren't any rules or regulations requiring private stablecoins to be backed 1:1 to a reserve currency, like the dollar or euro. This means stablecoins can be somewhat opaque when it comes to disclosing the fiat currency they have on reserve. As another example, USD Coin (USDC) was de-pegged from the US dollar earlier this year after the collapse of SVB, which held billions of dollars of the stablecoin's reserves.

What About Commercial Banks?

Even though CBDCs are issued by central banks, commercial banks will play a key role in the future of CBDC exploration, adoption and use as a correspondent banking partner. While digital currencies will likely reduce the amount of intermediaries necessary in a cross-border transaction²², they also present new opportunities for commercial banks to innovate alongside their central bank counterparts by providing new on-chain financial services to customers. Not only do commercial banks stand to gain from new business models and revenue opportunities, but they are also poised to play a pivotal role as an infrastructure provider, and in consumer and end-user adoption given their close working customer relationships and knowledge.

One example of commercial banks leaning into this future is with the Federal Reserve Bank of New York's Innovation Center. They are partnering with the likes of Wells Fargo, U.S. Bank, Citi and others to pilot a 12-week CBDC proof-of-concept without a central bank, where the aforementioned commercial banks will be "issuing tokens and settling transactions through simulated central bank reserves²³." If all goes well, the pilot has the potential to extend beyond CBDCs to include other digital currencies and stablecoins. The project serves as an exploration of

recent research around the use of a wholesale CBDC to potentially enable faster, more cost-effective, and accessible wholesale cross-border payments.

Sustainability and Financial Inclusion

Sustainability is top of mind for global payments leaders, who acknowledge the environmental impact associated with blockchain use particularly with regards to the importance of low energy consumption²⁴. Encouragingly, data from this year's research only further exemplifies this. When asked how important, if at all, sustainability is to them in the context of blockchain and cryptocurrency usage, on average 78% and 80% of all respondents claimed either very or extremely important, respectively.

However, when it comes to CBDCs specifically, we were a bit disappointed (albeit not entirely surprised) that sustainability ranked lowest on the list of important considerations for use of CBDCs. So, while it appears that, generally speaking, global finance decision makers think sustainability is important from a high level, it's not necessarily a deciding factor when it comes to whether or not their organization would use a CBDC or other cryptocurrency.

FIGURE 08

Importance of Sustainability in Blockchain & Crypto: 2022 vs. 2023

Blockchain Usage



Cryptocurrency Usage

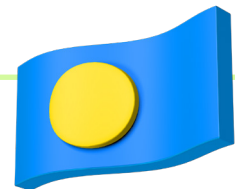




On the flip side, when it comes to the benefits of the technology, we were encouraged to see that financial inclusion ranked much higher—only one percentage point below data security. Similarly, financial inclusion ranked in the top three most important considerations for CBDC use. As mentioned earlier, financial inclusion is at the heart of digital currency solutions like CBDCs. This becomes exponentially important in regions like Africa and parts of Latin America where there is a lack of infrastructure, and much of the population is rural and without easy access to physical bank branches. With a CBDC, those individuals would have the newfound ability to send and receive payments anywhere, anytime—including those who don't have a traditional bank account.

CRYPTO CONCEPTUALIZED:

Palau Case Study



Ripple is working with the Republic of Palau on a pilot of a stablecoin—pegged to the US dollar as that is the currency they use—leveraging blockchain technology. The Palau stablecoin will benefit citizens by offering secure, anonymous transactions in less than three seconds, accelerating payments, and minimizing energy usage and the overall carbon footprint associated with payments.

In working with Ripple on the Palau stablecoin, it's expected that Palauans will be able to purchase goods from participating local shops, conduct local transactions and make mobile payments using the country's stablecoin. With sustainability as a guiding principle, they chose to build their stablecoin on the XRP Ledger (the first major blockchain to be carbon neutral) using its native digital

asset XRP (which was purpose-built for payments and doesn't require mining) to provide a fast, low-cost, sustainable solution that's better for businesses, consumers and the environment.



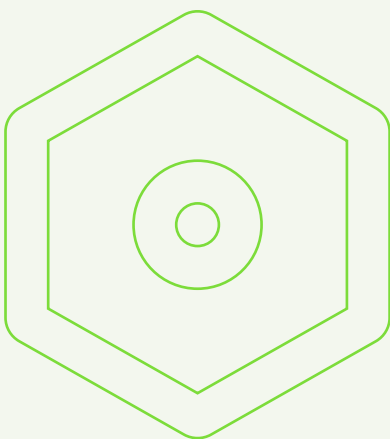
Close

This year's report focused primarily on the NFT and CBDC token types. As is already apparent in the industry—and as our study confirms—initial NFT hype around art and digital collectibles is waning, and real-world, business uses of the technology are taking shape and driving real value right now. In conjunction with additional applications of block-chain and crypto technology, like decentralized identity and DeFi more broadly, the opportunities afforded by tokenization for business are seemingly endless. But it is still very early days, and we undoubtedly have a lot of discovering to do.

As evidenced with countries of all sizes piloting and exploring the technology—from Palau to China and in between—CBDC solutions more broadly have not only found product-market fit, but are being piloted across

the globe. While accelerated payments, less energy consumption, more sustainable global economies, and improved financial inclusion are tall orders and won't happen overnight, finance leaders are optimistic that the technology can and will meet these high expectations.

And even though challenges remain—particularly around privacy/security, and the need for more regulatory clarity—adoption trends are promising. There is ample opportunity to continue to not only educate, but empower banks, financial institutions, governments and businesses on the impact, importance and real-world utility of tokenization and CBDC solutions.





Section

Manage



Real-world tokenized assets on-chain are critical and are achieving scale through pilots in both the public and private sectors.

With all these assets being tokenized on the blockchain, how can companies and financial institutions ensure proper management and use of these digital assets and their underlying value, and what are the best ways of doing so? When it comes to managing tokenized assets, that can mean anything from buying and selling; to holding and exchanging; to borrowing and lending; to collateralizing and rewarding; to staking and voting; to gaming and farming; and beyond.

Crypto use in general is exploding around the world. According to The Block Research's 2023 Digital Asset Outlook Report, North America, Asia and Europe are the continents where crypto activity was most concentrated in the past six years²⁵. And big names in the financial industry like JP Morgan, BlackRock, and Fidelity are now touting blockchain's ability to solve real-world problems around trust, transparency, and data privacy. Fidelity is leaning in with the upcoming launch of Fidelity Crypto—a new app for crypto investing and trading. Needless to say, these companies have to then manage that cryptocurrency, including ensuring it is properly stored, secured and protected in a regulatory-compliant way—either through self-managed or third-party custody.

Simultaneously, DeFi markets, practices and protocols are evolving to offer more institutional-grade lending and borrowing products in an effort to make financial services available to more people, improve agility and liquidity of tokenized assets, and increase consumer protection and regulatory compliance. DeFi protocols like trading and lending improve liquidity for tokenized assets, while decentralized identity has the potential to enhance compliance and onboarding processes.

So, this year we're honing in on two important and growing aspects of managing crypto: institutional adoption of DeFi and crypto custody.

Over 3/4 of global financial institutions are interested in using DeFi to meet business needs.



Why Institutional DeFi is Making Waves

Summary of key findings:

Global finance leaders are interested in exploring DeFi as a means of driving innovation for their business in the next 3 years

Significant or massive DeFi impact is anticipated across a variety of use cases, including:

88%

Risk management

86%

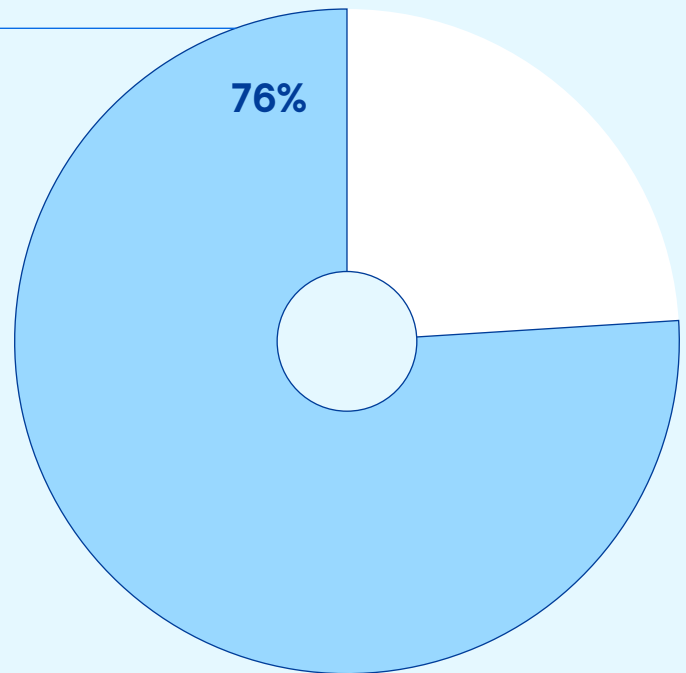
Identity management and borrowing/lending

87%

Real-world assets (stocks, bonds commodities) and liquidity management

83%

Insurance



Finance leaders expect big business benefits:

- Improved operational efficiency
- Better data management
- Access to 24/7/365 markets
- Greater financial flexibility

Across a variety of use cases, but **particularly for use in payments.**

86%

are currently using or exploring some form of digital asset services, especially for consumer-to-business and cross-border payments

Custody:
to self-manage or not?

50+%

of global finance leaders plan to use a custody solution in their business within the next 3 years





Institutional DeFi

There is burgeoning demand from institutions—banks and central banks, Payment Service Providers (PSPs), crypto PSPs, fintechs, and more—to use DeFi as a critical, future financial framework. As an alternative to traditional financial services, DeFi leverages immutable public ledgers and smart contracts to enable 24/7/365 access to financial services; new markets, buyers and sellers; and often near real-time transactions that are fast, secure and transparent.

Institutional DeFi leverages that core functionality and approach, and layers on existing financial compliance frameworks necessary for institutions to take advantage of the inherent benefits of the blockchain. This not only helps ensure financial integrity and the appropriate safeguards for consumer protection, regulatory compliance and risk analysis, but also enables a global, out-of-the-box, flexible, inclusive, lower cost, and more efficient system. All without compromising security and stability.

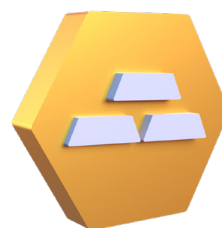
In the broader field of DeFi, The Block Research's report also notes that the DeFi narrative started to gain traction in 2020, with the number of early-stage deals increasing 11-fold from 2020 to 2022. And DeFi grew from less than \$1 billion to over \$250 billion in value locked in less than two years (May 2020 – Dec 2021). Broadly speaking, while some institutions have lingering hesitations related primarily to compliance and regulatory clarity,²⁶ enterprise use cases for DeFi like cross-border payments, lending/borrowing, insurance and settlement continue to be proven out, with estimates that most securities (i.e. stocks, bonds, equities, etc.) will be tokenized by 2030²⁷. These use cases are core to the financial services industry, and with new and improved ways to offer those services to customers, we will undoubtedly see continued institutional exploration.

Government-backed financial institutions around the world are exploring institutional DeFi to tap into market potential, free up liquidity and save costs with faster settlement. El Salvador aims to raise \$1 billion from investors in an effort to tokenize bonds. The Israeli Minister of Finance in partnership with the Tel Aviv Stock Exchange is piloting blockchain-based digital bonds. And the World Bank launched its bond-i in 2018 marking the world's first bond

to be “created, allocated, transferred and managed” on a blockchain—adding secondary bond trading a year later in order to enable faster, secure transactions for capital markets²⁸.

Indeed, there are well-known finance advocates and early adopters. In November 2022, DBS Bank, J.P. Morgan, and SBI Digital Asset Holdings conducted foreign exchange and government bond transactions on the Polygon network—a decentralized, Ethereum-based platform. This is believed to be the first time a major bank tokenized deposits on a public blockchain. Additionally, another industry report points to the example of J.P. Morgan leveraging tokenization to offer digital asset solutions for clients, and DBS Digital Exchange offers enterprises a platform to raise capital by digitizing assets and securities²⁹.

With industry giants like these exploring the potential of DeFi, we expect to see an increasing number of similar pilots in the coming years, led by governments, financial institutions and enterprises.



\$250B

**Total DeFi value locked in December 2021,
up from \$1B in May 2020**



Perceived Impact and Interest

Findings from our research are in line with those expectations. The vast majority of global respondents expect significant or massive impact of DeFi practices and protocols across all areas measured.

As the figure below demonstrates, this relatively even split shows us that the anticipated effects of institutional DeFi are many.

Nearly half of all respondents are extremely interested in exploring DeFi as a way of driving innovation over the next 3 years, and another nearly 30% are very interested.

When digging into which areas respondents are most keen to leverage DeFi in their business, we learned that there is strong interest in use of the technology across a variety of applications. Of those areas we surveyed specifically in our study, response rates were nearly evenly split across using DeFi for various business needs.

Financial institutions in particular are optimistic about DeFi in their businesses. In fact, upwards of 15% claim they are already exploring or using DeFi for those purposes.

While we would expect this sentiment to be particularly strong among those in roles related to digital transformation, blockchain/cryptocurrency or innovation (which was the case), it's worth noting that responses didn't seem to vary too much among those in more traditional finance roles like payments and capital markets. In comparing average response rates, there was only a 3% difference between the two groups - 78% and 75%, respectively.

Use cases

DeFi markets, practices and protocols can be applied to business applications in many shapes and sizes, including taking out a business loan or sourcing funding for a lending business. This enables companies to take out or fund loans quickly and easily using digital assets (such as stablecoins, cryptocurrencies, and digitized real world assets) deposited via a smart contract. The lending business generates interest on those assets the same way banks and lenders earn interest on traditional lending practices and currencies.

For payments leaders and those in institutional banking, the idea of using DeFi for these use cases isn't entirely new. Indeed, we discovered high levels of comfort among those respondents at financial institutions—particularly

FIGURE 09

Perceived Impact of DeFi Over the Next 3 Years

● Non-Existent ● Insignificant ● Significant ● Massive

in percentages %

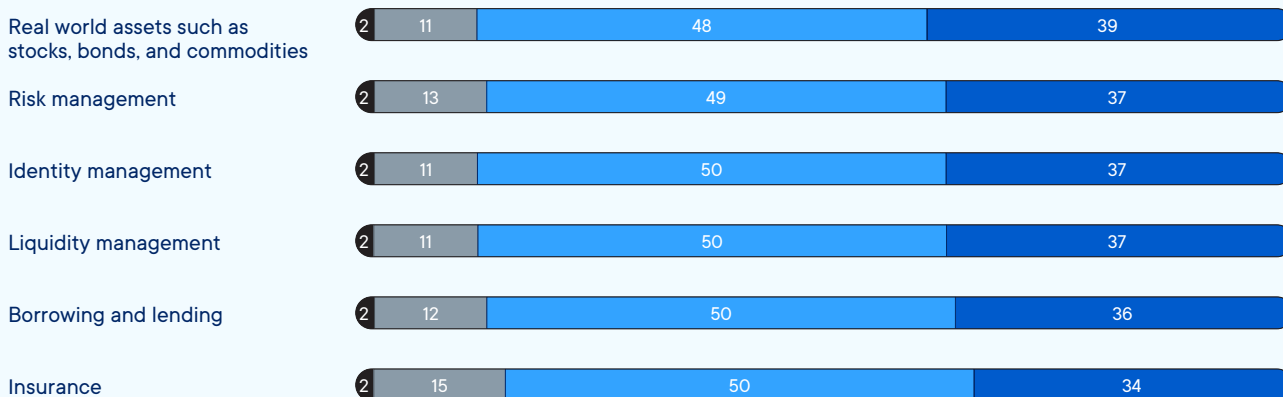




FIGURE 10

Financial Institution Interest in Using DeFi for Business Needs

Level of Interest	Extremely	Very
Using DeFi for on-chain compliant finance (i.e. applying KYC/AML and other regulatory finance procedures to a blockchain transaction)	47%	31%
Offering DeFi-driven services to customers	47%	29%
Using DeFi for crypto native assets	46%	31%

among institutional banking leaders—indicating high likelihood of using the technology for those purposes within the next three years. Current macroeconomic factors play a role here; for example, the current banking crisis in the US means available credit is shrinking, credit conditions are tightening, and interest rates are on the rise³⁰. This presents a challenging lending landscape, especially for small-medium sized banks who are likely in search of alternative solutions.

As expected, familiarity with DeFi practices and protocols for business purposes wanes slightly among enterprises when compared to their financial institution counterparts, albeit still relatively high. Nearly two-thirds of enterprise respondents claim they are familiar with using the DeFi market to trade, borrow or lend tokenized assets (e.g. gold, stock, bonds); provide liquidity using digital assets to earn yield; and sourcing digital asset liquidity.

Benefits

Both financial institutions and enterprises alike see DeFi bringing benefits to their business, including advantages like improved operational efficiency (46%) and better data management (45%).

Zeroing in on financial institutions, we see an interesting breakdown of business benefits by role type. Improved efficiency and automation remained in the top three most

frequently selected responses among all types of financial institution respondents, with the exception of payments professionals. Those who work in payments specifically place more value on access to 24/7/365 markets.

Where responses ranked consistently lowest across the majority of role types was access to new markets, followed by greater liquidity.

We were surprised to see that broader financial inclusion was selected more frequently as a benefit than new markets and liquidity. However, this is encouraging as financial inclusion is core to the concept of the Internet of Value and primitive to web3, whose primary promise is centered around decentralization, fractional ownership and increased access to financial services.

Pain Points to Solve

We wanted to dig further into what might be driving enterprises to turn to institutional DeFi, and what their biggest pain points are around borrowing and raising capital specifically that DeFi might help solve.

High interest rates currently outweigh other borrowing related pain points by a pretty significant margin everywhere except in MENA, where credit approval requirements were ranked as the primary pain point. These findings are reflective of the current state of the global economy, and that's reinforced when we compare these results to last year's data when interest rates were lower, and thus ranked lower on the list at that time.

2/3

of enterprise finance leaders are familiar with using DeFi for trading, borrowing, lending, using digital assets to earn yield, and sourcing digital asset liquidity



FIGURE 11

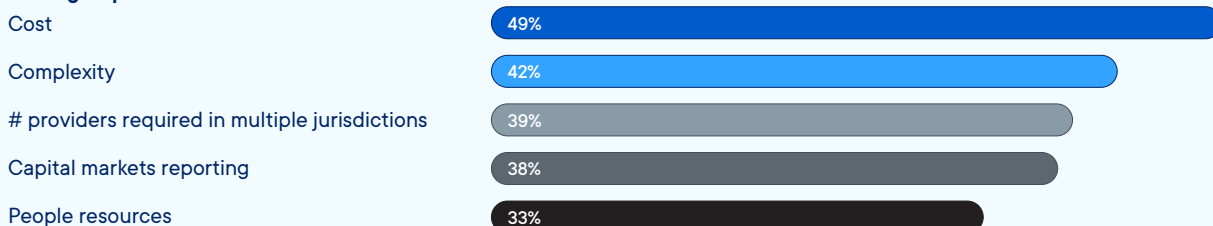
Enterprise Pain Points Related to Borrowing and Raising Capital

% Ranked in Top 2 Pain Points

Borrowing



Raising Capital



When it comes to raising capital, cost is somewhat of an outlier but there is otherwise no stark contrast in the data. In other words, enterprises appear to be grappling with a number of capital-related pain points rather than one primary challenge. Results follow a similar pattern to last year, with the cost of raising capital ranked slightly higher than the others. This means the challenges have remained the same, and there is ample opportunity to improve the current landscape and enable companies to more quickly and easily raise the capital they need in order to grow, scale and expand into new markets.

Decentralized Identity

Traditional financial services rely on data about individuals to meet compliance requirements. For these institutions to use DeFi protocols, they will need access to the same level of information about transaction participants to continue to meet those requirements. And while blockchains maintain complete, immutable and transparent transaction histories, they only provide that information for designated wallet addresses—obscuring the individual identities

beneath them. So, for institutional DeFi to really work, there needs to be some way for institutions to provide the data associated with those wallets that is required for compliance purposes, and in some cases, for other purposes like risk management.

Decentralized Identity (DiD)* can be a foundational building block to this future by further enhancing compliance capabilities, and providing a secure, decentralized way for individuals and institutions to verify their identities and ownership of assets.

With the global market valued at \$65B in 2022 and projected to grow at a 90% CAGR³¹, DiDs will more than likely become necessary for more robust regulatory compliant and DeFi applications to be built out as they enable secure, trustless transactions and thus afford benefits to and key requirements of institutional DeFi across on-chain privacy and security, compliance and counterparty risk, reputation and interoperability.

* A DiD is a decentralized, self-sovereign identifier that is stored on-chain (i.e. in a crypto wallet) containing metadata that is linked to personal information, which is stored off-chain.



Developers across many major blockchains—Polygon, Hyperledger, XRP Ledger—are now exploring DiD solutions coupled with what are called “zero-knowledge proofs”* to help safeguard user data while simultaneously meeting compliance requirements. Looking at Polygon ID as an example, the blockchain has implemented verifiable credentials for users to generate zero-knowledge proofs (zk-proofs) as a way to prove they are not a robot, or that they are 21+ years old if they are trying to purchase alcohol online in the United States—without revealing any other unnecessary personal identifying information (or PII).

Perceived Impact and Uses

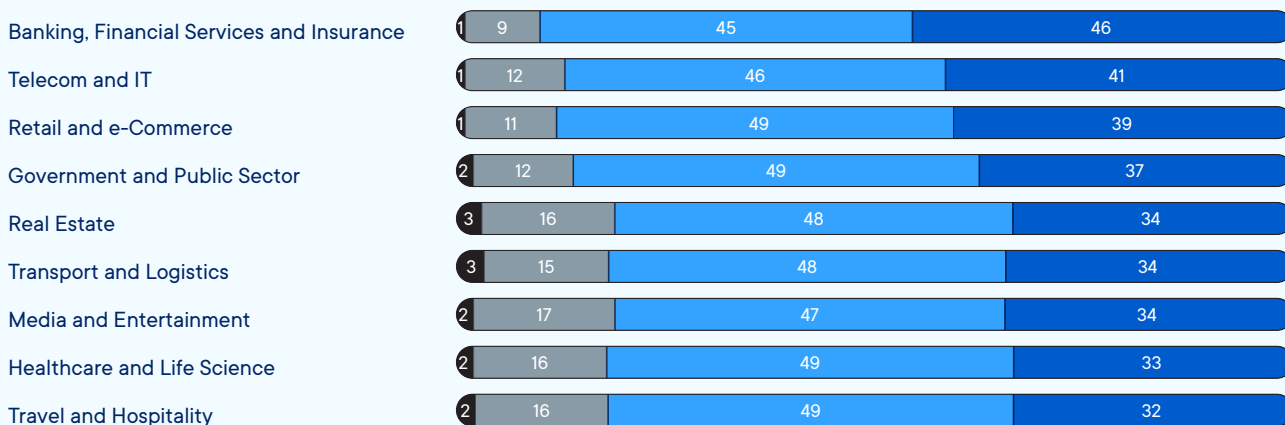
As with all crypto-enabled technologies, DiDs can be applied across a multitude of industries, verticals and sectors; use cases and functions; and on a global scale. In an effort to better understand how this will likely shake out over the next few years, we asked finance leaders at both financial institutions and enterprises which industries they see DiD having the largest impact on in the next three years.

FIGURE 12

Perceived Impact of DiD Over the Next 3 Years

● Non-Existent ● Insignificant ● Significant ● Massive

in percentages %



*Zero-knowledge proofs (zk-proofs) allow one party to prove the validity of a statement to another party without revealing the actual data or information that proves the statement true or false. They serve as a tool to help protect user data while simultaneously providing an on-chain identification tool for decentralized apps (dApps).



The vast majority (90%) think DiD will have a significant or massive impact on Banking, Financial Services and Insurance in the next three years, especially finance leaders in LATAM and MENA. Even those in treasury, capital markets, payments, and institutional banking are bullish on the technology as it pertains to Banking and Financial Services, falling within the 90% response rate and above for significant or massive impact. Surprisingly, finance leaders in those more traditional roles ranked slightly higher than those in innovation, which is somewhat counterintuitive.

But perhaps most interesting of all is that there was no industry that the majority of respondents didn't see being at least significantly impacted by DiD in the next few years. In other words, we can likely expect to see lots of growth, new pilots and novel use cases from companies testing and proving out DiD solutions for their business.

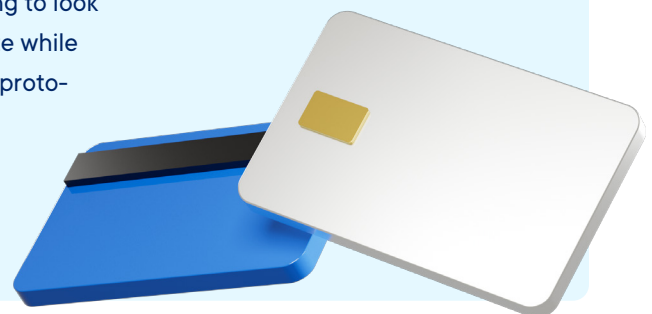
Where perceived impact wanes slightly is among compliance professionals, yet the overall anticipated impact of DiD was still high even among compliance-related roles. Additionally, compliance professionals specifically see DiD technology having the biggest impact on the government and public sector. This sentiment can perhaps be attributed to the fact that government and public sector agencies have a multitude of use cases for identity verification: from passports and driver's licenses, to legal documents like property deeds, taxes, welfare payouts, etc. However, it's likely that the Government and Public sector will be much slower to adopt the technology than other verticals as they explore how to deploy the technology at scale and navigate global interoperability and governance.

CRYPTO CONCEPTUALIZED:

On-Chain Credit Scores

Decentralized apps (dApps) like Spectral Finance offer a credit worthiness measurement based solely around on-chain actions. Leveraging the Ethereum blockchain, the company offers on-chain credit risk assessments, including loan activity, asset balances, NFTs, etc. across different DeFi protocols.

Spectral Finance's MACRO Score (a blockchain version of the FICO score) shows how a DiD product can be used for DeFi applications, for example lending protocols could use the MACRO Score to judge a potential borrower's risk profile. Analyzing the MACRO score would take the place of having to look at a user's entire transaction history, keeping their transactions private while still judging their potential risk. This provides an opportunity for DeFi protocols to become more aligned with current finance regulations.





Benefits

Similar to institutional DeFi more broadly, the top most anticipated benefits of decentralized identity surfaced in our study are operational (improving efficiency and data management), as well as creating new revenue opportunities. The latter is an important proof point: 44% of respondents see new revenue opportunities as a top benefit of DiD, meaning companies are recognizing how these types of technologies can help them grow their top line and drive value.

While most major web2 companies profited from obtaining and leveraging consumers' personal data, web3 organizations leveraging institutional DeFi are seeking revenue opportunities that ensure consumers' data privacy while still meeting compliance requirements. This is a major shift in the landscape, and one example among many of how web3 technology is enabling changes to benefit both companies and consumers.

Digital identities are also at the core of the metaverse, and DiD in particular will provide a way for users to own their digital assets, personal information and virtual identities³². While initial hype around the metaverse has cooled, companies like Meta, Adobe and Shopify continue to invest in this area due to the increasing role of online identities across not only virtual worlds, but also gaming, social media, e-commerce, streaming platforms like Spotify, and more.

Barriers to Adoption

Given how nascent the technology is, we weren't surprised to see that results were mixed when asked about barriers to adoption of DiD solutions, and ranked relatively similarly across the board. Generally speaking, roughly 50% of respondents believe each of the following barriers are hindering institutional adoption of DiD solutions:

Most Frequently Cited Barriers to Adoption of DiD

- Compliance and risk management (especially among respondents in NA and APAC)
- Limited understanding of the DiD solutions landscape
- Lack of widely-adopted standards and protocols
- Lack of enterprise-grade infrastructure and tooling (especially among financial institutions respondents in roles related to digital transformation, blockchain/cryptocurrency, and innovation)

Given this distribution and the fact that it's still early days for DiD, we can glean that there is a very wide knowledge gap that needs to be filled, and a lot of exploration still to come. This creates opportunities for providers that can not only educate their customers around the technology and its business value (becoming a trusted resource and early thought leader in the space), but also create all-in-one, out-of-the-box enterprise-grade solutions for crypto-enabled services like KYC-as-a-service, digital ID, and security³³.



Custody

Crypto custody is how companies safely and securely store their tokenized assets. There are two options: self or managed custody.

Self-custody for corporate entities is when an asset manager (e.g. a pension fund or a fund manager like BlackRock or Fidelity) or a corporation takes on the role of a custodian to directly manage the sub-custodians in the markets and jurisdictions where they have a trading relationship. The alternative to the self-custody of tokenized assets is to appoint a global custodian bank. Managed custody is when a third-party holds and manages a customers' tokenized assets and private keys on their behalf, and is responsible for their safekeeping. This includes wallet management services that facilitate the tracking, valuation and servicing of the tokenized assets held.

With self-custody, individuals or companies protect and control their own assets without having to rely on a third party intermediary. This provides complete autonomy over their funds; increased privacy and security (private keys aren't stored on a central server); financial inclusion for those that are unbanked and don't otherwise have access to basic financial services; and a more decentralized solution.

The main drawbacks of self-custody are the amount of responsibility, complexity and technical savvy required in order to safeguard assets and information. Some self-custody wallets may also offer limited capabilities and functionality.

Managed custody solutions help alleviate the burden on a business to worry about private key management. And because permissions to move or transfer assets are not limited to a single individual or entity, managed custody and wallets provide customers with secure and convenient access to digital assets. With managed custody, customers can take advantage of the providers' regulatory compliance expertise, insurance against loss or theft, and technical resources.

On the flip side, a third party custody solution could also mean potential delays or hidden fees, possible platform failures or other factors that could be outside the asset owner's control.

Current State

There is no "right" solution when it comes to crypto custody, but rather a case of determining which model best suits the needs of each customer. In the wake of FTX and other crypto firm collapses, it's become more important than ever for banks, crypto fintechs, and others to have the appropriate custody solution in place that meets their business needs.

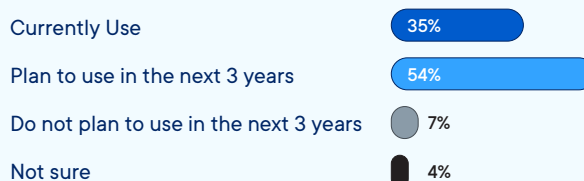
As part of our research, we wanted to gain a better pulse on the current state of crypto custody—especially in light of recent market events—and paint a clear picture of the landscape. While a greater proportion of respondents at financial institutions (compared to their enterprise counterparts) currently use crypto custody in their business, in general across all respondents we found that a total of 35% are currently using a custody solution and 54% plan to within the next three years. Additionally, most companies currently or planning to use crypto custody will do so via a managed custody approach outsourced to a third party.

But why is that? What are the primary benefits and reasons that would drive organizations to choose a managed custody solution? Increased security and resilience to protect digital assets and reduce risk, and up-to-date, best-in-class technology were among the primary drivers.

Though security was the top reason across all respondents in all geos, it was particularly important among the enterprise audience. Additional reasons why enterprises might

FIGURE 13

Most Finance Decision Makers Plan to Use Managed Custody in the Next 3 Years





look to managed custody include improved operational efficiency, reduced operating costs, and the ability to future-proof their technology and processes to enable them to take advantage of opportunities in an evolving space.

Regardless of whether enterprises use self or managed custody, both approaches typically leverage a third party software provider's technology. However, managed custody solutions tend to be regulated, so even though a managed custody provider might use the same technology or infrastructure provider, they do so in a regulated, licensed manner on behalf of their customers.

Key Considerations

Widespread use of cryptocurrency for payments and demand more generally for digital assets are two of the most important considerations for financial institutions providing custody services to their customers. In order for there to be a market for managed custody providers and B2B2C solutions, there needs to be more widespread demand and use of digital assets that require custody. In other words, this can be interpreted as supply and demand, where use and adoption of digital assets begets further need and use of custody solutions.

While digital asset appreciation can be difficult to predict—as recent events have illustrated—certain asset-backed stablecoins have been designed to protect holders from price swings. Because they are pegged to a national currency, their value largely remains stable. Therefore, if the value of a certain cryptocurrency drops or swings dramatically, holders can move their funds into stablecoins to protect their portfolio.

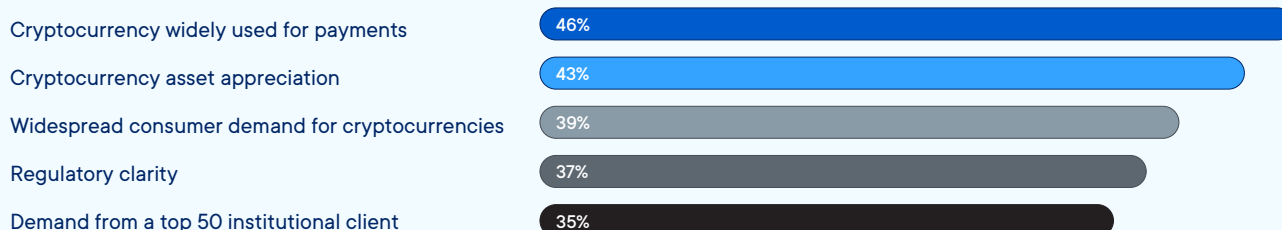
Other considerations that are top of mind for financial institutions include widespread consumer demand for cryptocurrencies and other digital assets (in the same vein as widespread use), demand from a top 50 institutional client (of the utmost importance for those in blockchain/cryptocurrency roles), as well as regulatory clarity.

As with crypto and blockchain in general, the regulatory landscape for custody is still fragmented and unclear across jurisdictions. In the US alone, custody requirements and regulations can vary not only at the federal level, but also at the state level. While historically the global custody and regulatory landscape has been patchwork at best, progress is being made. European Union lawmakers recently approved MiCA (Markets in Crypto Act), the first comprehensive framework for global crypto regulation³⁴.

FIGURE 14

Considerations for Financial Institutions Offering Custody Solutions to Customers

% Ranked in Top 2 Importance





Managed custody solutions in particular can and should be regulated in order to operate in the best interest of their customers, but to also help alleviate challenges associated with making cross-border payments and otherwise conducting business internationally.

Encouragingly, some of the financial industry's most reputed (and regulated) players share the same sentiment. BNY Mellon offers digital asset custody for asset managers in the US. More recently, NASDAQ announced their plan to launch crypto custody services for Bitcoin and Ethereum by the end of Q2 2023, signaling the stock exchange's first step toward a larger digital asset initiative³⁵. And the likes of BNP Paribas, UnionBank of the Philippines and Société Générale are investing in digital asset infrastructure that enables them to build and manage digital products on various blockchain ledgers and realize new operating efficiencies in the management of cryptocurrencies and digital assets.

Institutional-grade custody solutions are the secure middleware that can integrate with a bank's core banking tech stack and other in-house systems (for example, AML) enabling them to grow and scale.

Crypto Liquidity

Tokenizing different asset classes, using DeFi protocols to move, manage and transact with those tokens, and custodizing those tokens to keep them safe and secure are relatively straightforward on a small scale, (e.g. for an individual trading NFTs.) But for companies looking to grow and scale an enterprise-grade crypto-enabled solution, the illiquid nature of these types of tokens becomes an issue.

Tokens are subject to network effects—the more the token scales and the more adoption it receives, the more utility of the technology is realized by the user³⁶. But the current state of today's fragmented market reduces liquidity. Broadly speaking, liquidity indicates the ease and speed with which you can convert a digital asset into cash or other digital assets—and whether this can be achieved without the asset's value suffering. Crypto liquidity can be impacted by a number of different factors, including the number of users on a platform, price volatility, trading volume, and market efficiency.

For businesses leveraging crypto for operational purposes, liquidity can enable growth, protect against risk, and help facilitate core treasury functions. As a business scales, it must maintain proportionately higher levels of liquidity to optimize operations and sustain growth. To satisfy this demand and source liquidity at optimized pricing—all while trying to avoid disruptions—businesses will often tap multiple exchanges or marketplaces to build liquidity through currency trading and payments.

Yet, each liquidity venue is dynamic with different rules of engagement and constantly changing levels of liquidity volume and quality. The complexity of managing digital assets across all these venues can become onerous. Adding crypto into this liquidity mix can provide important advantages but brings additional management challenges.

So why might financial institutions and enterprises want to hold crypto on their balance sheets in the first place? Companies that leverage crypto may realize a whole host of benefits, including access to new asset classes, immutable and transparent data, increased liquidity and faster settlement³⁷. And as cash usage declines, they are also able to meet growing consumer demand for crypto, for example employees who prefer to be paid in crypto, fiat or a combination of the two; or customers who want to purchase goods or services using crypto³⁸.

Use of Digital Asset Services

Double clicking on financial institutions, our study showed that the majority of global respondents are either already using, currently exploring, or interested in exploring the use of digital asset services. And those in institutional banking or payments-related roles seem to be the primary drivers.

3/4

of financial institutions are likely to explore digital asset services in the next 3 years



Among those not already using or exploring digital asset services, over three-quarters are either somewhat or very likely to do so in the next three years. This is very promising for the industry, reaffirming overall sentiment and attitudes toward crypto, the belief that the technology is here to stay, and that financial institutions are gearing up.

As the figure below shows, those same respondents also anticipate (or perhaps already are) using digital asset services across a variety of payments-related use cases.

Buying, Selling and Holding Crypto

Looking more closely at the enterprise landscape, we see that those finance leaders are particularly interested in holding cryptocurrency to make payments, and for use as a hedge against inflation. The latter ranked highest among respondents in LATAM, which is reflective of the region's recent (and perhaps historical) challenges with high inflation and interest rates.

When comparing these results to last year's, the reasons to hold crypto have remained largely the same with one exception. While making payments and inflation hedge were in the top three last year, respondents had also included "as an asset to lend/collateral for borrowing." This year, "hedge against foreign exchange risk" edged that reason out of the top three box. This is in large part

driven by macroeconomic factors like high interest rates and inflation, or in the US where there are significant slowdowns in lending and borrowing activities (as evidenced in the housing market, as one example).

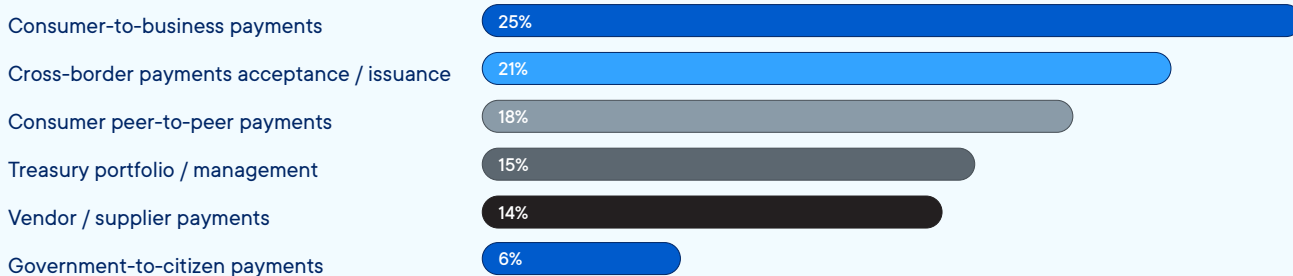
As more enterprises adopt crypto (and more assets are tokenized), it is increasingly critical that businesses can seamlessly bridge the new world of digital assets with the traditional world of fiat. Whether it's converting bitcoin to fiat, managing a crypto position, or accessing last mile payout rails, there is demand for interoperability between financial systems. But without a ton of overhead, large technical teams, and crypto savvy, it can be extremely difficult to try and implement an in-house crypto liquidity solution. When it comes to build vs. buy, 72% of digital asset investors would prefer an integrated provider³⁹. For those companies, partnering with a third party solution like Ripple's Liquidity Hub* helps to remove those barriers to entry.

Additional Benefits of Optimized Crypto Liquidity

- Redundancy
- Meeting customer demand
- Reduced operational overhead
- Reduced pre-funding

FIGURE 15

Use Cases for Digital Asset Services



*Liquidity Hub is based on an easy-to-integrate API that seamlessly bridges crypto and fiat systems, enabling businesses to access optimized crypto liquidity. With access to deep liquidity from multiple providers and smart-order routing, companies gain the necessary tools to power crypto payments, crypto operations and support their users in buying, selling and holding crypto.



While many non-bank financial institutions like fintechs and neobanks help both financial institutions and web3 organizations integrate and become “crypto friendly,” they too still rely on traditional payment rails and networks—ultimately sacrificing payments cost and speed⁴⁰.

Leveraging a truly crypto-native solution can automate the crypto in/out process, integrate global crypto on/off ramps, and facilitate easier crypto deposits and withdrawals. This not only helps diversify portfolios and facilitate faster payments, but also expands revenue sources and opens up access to 24/7/365 markets.

FIGURE 16

Top Reason to Hold Cryptocurrency

As a currency for making payments

50%

Hedge against inflation

44%

Hedge against foreign exchange risk

39%

Hedge against macroeconomic factors

35%

As collateral for borrowing

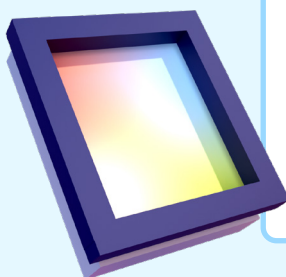
32%

CRYPTO CONCEPTUALIZED:

Supermojo Case Study

Supermojo is a cutting-edge tech platform that is revolutionizing the world of Non-Fungible Tokens (NFTs). The core mission centers around driving greater accessibility of NFTs in order to make interacting with brands and creators easier for consumers. Supermojo has developed strategic partnerships with creators, brands, digital asset marketplaces, and storefronts to offer simplified card onramps and custody solutions with embedded utility.

Ripple Liquidity Hub plays a crucial role in supporting Supermojo with its internal treasury operations by sourcing ETH on demand for customers purchasing NFTs. The impact of Liquidity Hub on Supermojo's business operations is sizable; the company no longer needs to hold pre-funded capital



“

There are some instant benefits we get from Liquidity Hub: programmatic, upfront pricing that powers our acquisition of ETH NFTs instantaneously and on demand. That is a big order that doesn't really exist from the other platforms that we've tried before.

Craig DeWitt
Head of Product & Engineering, Supermojo

”

positions with multiple liquidity venues. Liquidity Hub acts as a capital management or hedging solution to minimize risk exposure with other venues.



Close

There are many aspects to managing digital value, none of them simple. But with the right underlying technology, partner, and solution in place, financial institutions and enterprises stand to gain myriad advantages by adopting DeFi protocols and practices.

As highlighted in this section, it's clear that finance leaders across the globe are taking note, and many are already well on their way to integrating or exploring DeFi and digital asset services in their organizations. Be it for borrowing and lending, accepting crypto payouts, or to hedge against inflation and FX risk, there are many areas where institutional DeFi can enable organizational excellence and better customer experience.

Arguably, this is the area where the industry at large has the most to learn—both from a technical perspective in areas like decentralized identity, zk-proofs and crypto custody, but also from a regulatory perspective. As we move on to the next section we will continue to see the common thread of the need for regulatory clarity woven throughout.





Section

Move



Finding new, innovative ways to move value (i.e. make payments) that are faster, more transparent, secure and reliable is core to the concept of the Internet of Value.

Indeed, it's what we at Ripple have advocated for the last decade. And while some of those concepts were nascent when we first set out, they've now become commonplace and part of the narrative among financial leaders at banks, PSPs, and fintechs; at businesses and corporations of all sizes; as well as central banks exploring CBDCs for domestic and cross-border payments.

In fact, major finance players are placing big bets on blockchain technology. Earlier this year Mastercard announced over 2 billion tokenized transactions made per month, a 38% increase YoY. The company also launched over 30 crypto-friendly debit and credit cards and digital wallets in 2022. And Goldman Sachs used crypto and blockchain technology for a €100 billion bond sale that closed in under a minute as opposed to the typical five day settlement time⁴¹—an example of enabling blockchain-driven payments for asset purchases. Enterprise use of crypto is also continuing to expand and evolve with companies like PayPal, Stripe, WorldPay, AT&T, Burger King, and Overstock now accepting cryptocurrency as a form of payment.

The volume of value, and methods by which that value is moved around the world, is also constantly evolving. In general, global payments volumes are on the rise (primarily driven by APAC)—revenues increased 11% in 2021, while overall electronic payments transactions saw a growth of 19% in the same year. In a post-pandemic world, trends including declining cash usage and a massive uptick in e-commerce sales are prominent. As businesses and their customers pivoted, e-commerce experienced 17% growth in 2021 (primarily driven by China), and cash usage fell by 20% globally in 2020⁴².

Further, digital payments methods like instant and mobile payments and account to account (A2A) transfers accounted for 29% of global revenue in 2021⁴³. It's important to remember that these are not necessarily new innovations. Many regions and countries like Brazil with its open banking system, Pix; the European Payments Council's SEPA program⁴⁴; Vodafone's mobile money transfer service, M-PESA, in Africa; and WeChat Pay and Alibaba's Alipay in China, have already invested in modern instant-payment systems and have been leading the way for some time now (more than 20 years in the case of Alipay).

The next wave of innovation for digital payments methods powered by blockchain and crypto technology will not necessarily be focused on replacing these systems, but rather identifying ways to improve them, with a shift toward building value-added applications and services underpinned by these more incumbent rails. Be it with faster, more cost-effective payments; enabling even greater financial inclusion in historically underserved markets; or protecting privacy while simultaneously providing greater transparency over the transaction process, we can likely expect an uptick in adoption across a variety of use cases.

The next wave of innovation for digital payments methods powered by blockchain and crypto technology

will not necessarily be focused on replacing these systems, but rather identifying ways to improve them.



Crypto & Digital Assets for Payments: Current Adoption and Forward Trends

Summary of key findings:

Global finance leaders see use as a payment method as the biggest accelerator for the adoption of crypto and digital assets

The same amount see use as a payment method as the biggest accelerator for the adoption of crypto

Top 3 use cases for both financial institutions and enterprises using crypto for payments:

53%

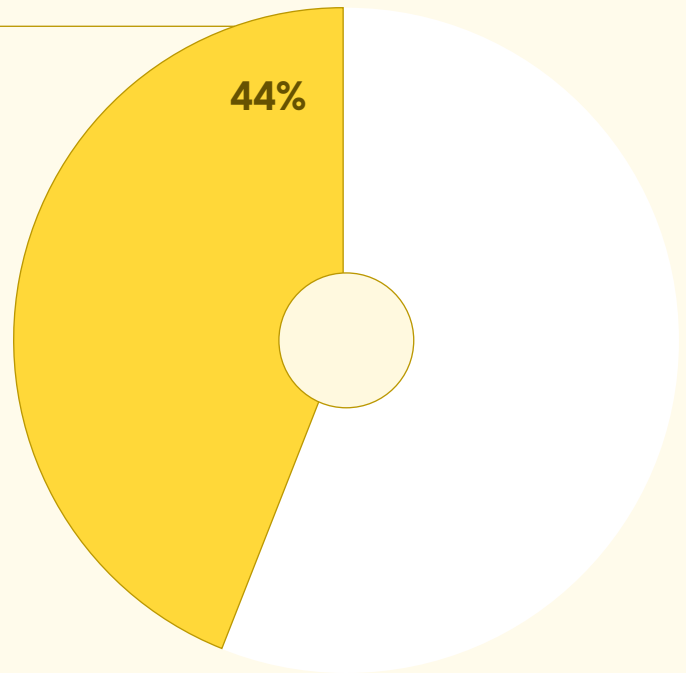
Accepting payment in the form of crypto

52%

Enabling customers to make crypto payments

47%

Making cross-border payments in crypto



Adding Value to Cross-Border Payments

58% of global payments leaders see faster payments as the #1 value prop for incorporating crypto into cross-border payments

- 58% of global payments leaders say faster payments
- 50% of global treasury leaders say cost savings

Top pain points that crypto can address for:

- Payments: expensive payments structures (32%)
- Treasury: time-consuming middleware integrations into payments flows (38%)



Protection from Price Volatility is a Must

#1 biggest perceived risk of using crypto for payments

Price volatility

27%

Unclear regulation

20%

Highly restrictive regulation

20%

Unsecure technology

20%

Bad actors

14%



Payments Use Cases: Today and Tomorrow

Over 90% of global payments professionals believe crypto and blockchain will have a significant or massive impact on finance and business in the next three years. But what's driving this anticipated adoption? What are the biggest accelerators?

We asked, and here's what we found out: nearly half of all respondents (44%) selected "use as a payment method" as the key accelerator—particularly in APAC and among those in institutional banking, payments, and treasury.

Further, almost the same amount state that their organization is extremely willing to enable customers to pay with crypto, although it's worth noting that willingness was substantially stronger among financial institutions (51%) than enterprises (35%). This makes sense given the aforementioned institutional adoption of crypto and the robust payments infrastructure they already have at their disposal.

Surprisingly, regulation as a key driver of adoption did not rank as high as we thought it would. Where things get really interesting is breaking this down by role type: a greater percentage of finance leaders in digital transformation, blockchain/cryptocurrency, or innovation roles think regulation will be an accelerator to crypto adoption,

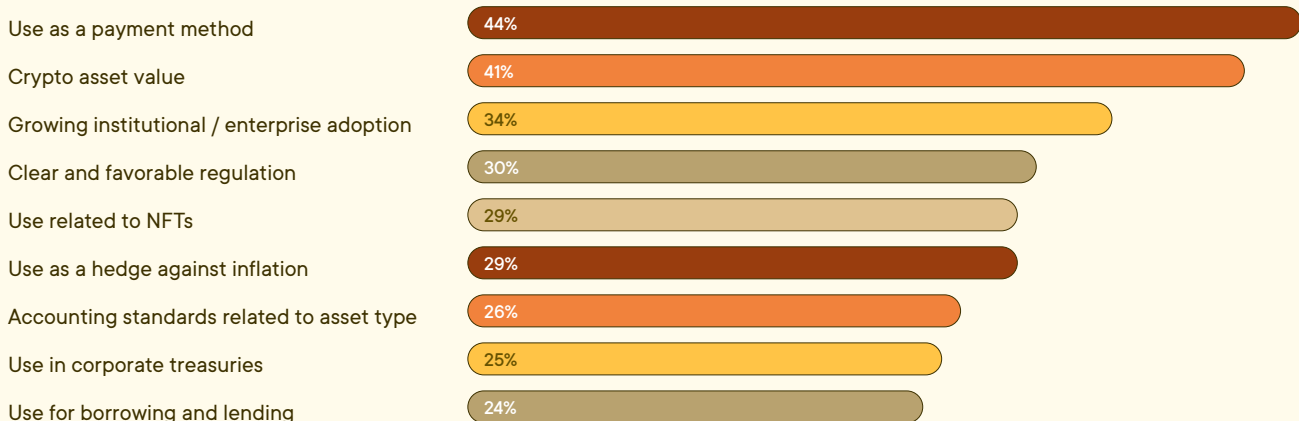
compared to their more traditional counterparts (those in institutional banking, payments, capital markets, treasury and compliance). Those who are championing these technologies at their organizations undoubtedly know the importance of clear and favorable regulations in order for crypto to realize its full potential. And while more traditional financial players have historically not been advocates of more regulation, it will be interesting to see if and how that changes in light of the collapse of major commercial banks like SVB and Credit Suisse.

90+%

of global payments professionals believe crypto and blockchain will have a significant or massive impact on finance and business in the next three years

FIGURE 17

Accelerators for Crypto Adoption





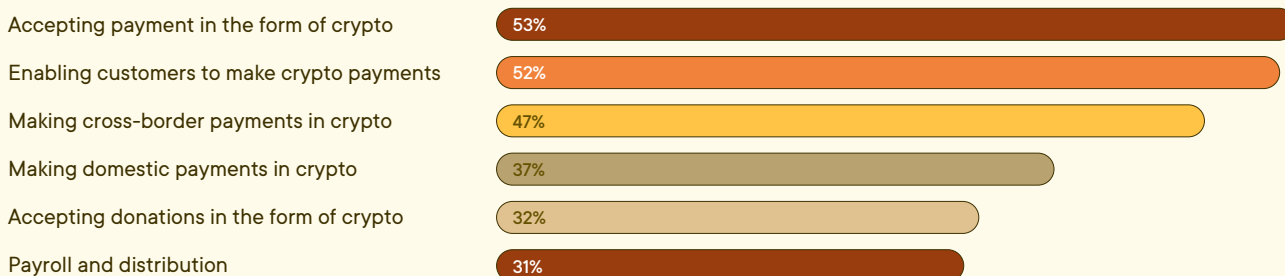
More enterprise respondents plan to use crypto for payments in the future compared to their financial institution counterparts. Of those that do currently use crypto for payments, the majority typically do so by moving funds directly from a digital wallet they manage (as opposed to via an aggregator's or payment service provider's digital wallet). This was true across all role types with the exception of compliance professionals, who more often enable customers to pay with crypto via a PSP (e.g. PayPal, Stripe, Square, etc.) This makes sense since PSPs are regulated and therefore are already in compliance with relevant regulatory requirements, which means less burden on internal compliance teams.

For those that plan to leverage crypto for payments in the future, over half plan to do so in order to accept payment in the form of crypto, and to enable customers to make crypto payments.

Interestingly, the top four use cases are especially important among enterprise respondents. And since we know that more of those companies say they have future plans to use crypto for payments compared to financial institutions, it seems we can expect to see quite a bit of growth and adoption among that sector in the near future. This is a positive indicator of broader business adoption of crypto, in large part driven by e-commerce companies. Since the COVID-19 pandemic, over one quarter of all online businesses are planning to enable customers to pay with crypto by 2025⁴⁵.

FIGURE 18

Crypto Payments Use Cases





Double Clicking on Cross-Border Payments

It's no secret that payments today are costly. In other recent research we conducted, cost savings was cited among global payments leaders as crypto's primary benefit⁴⁶. With crypto, fees incurred by merchants are less than 1% compared with those of traditional fiat which typically hover around 3.5%⁴⁷. And when it comes to cross-border payments specifically, Juniper Research estimates up to a tremendous \$10B in savings for banks using blockchain technology for cross-border transactions⁴⁸, while a recent Checkout.com report found that 77% of merchants that accept crypto as a payment method also experience a subsequent increase in cross-border sales.

An average of 14% of traditional global cross-border transactions result in added fees incurred by the corresponding banking partner⁴⁹. This is largely due to high payment failure rates where there is still a lot of room for human error (i.e. manual processes), data inaccuracy and delays.

Indeed, the high cost of traditional cross-border transactions extends beyond financial institutions to enterprises as well. In our research, over half of enterprise respondents cited cost of payments as their biggest cross-border payments challenge, with high interest rates (another cost-related pain point) a close second at 49%.

\$10B

in savings for banks using blockchain technology
for cross-border transactions

52%

of enterprise finance leaders cite cost of payments
as their biggest cross-border payments challenge



Breaking this down by region, we see that enterprises in NA, EMEA and APAC are more burdened by the cost of payments, whereas for those in MENA and LATAM high interest rates cause more headaches for their cross-border payments business. Given the latter region's recent economic struggles with soaring inflation rates⁵⁰, these findings make sense and are something payment providers servicing that region should keep top-of-mind.

Traditional cross-border payments generally require currency conversions, and high interest rates contribute to exchange rate volatility. Fluctuations in exchange rates lead to unpredictable costs for businesses. This FX exposure can result in banks charging enterprise customers with new or higher fees to compensate for increased transaction costs incurred by the higher interest rates.

FIGURE 19

Cross-border Payments Challenges by Region

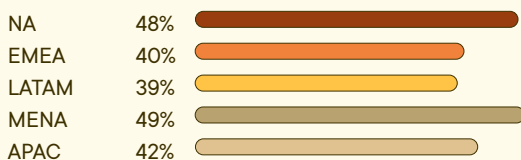
Cost of payments



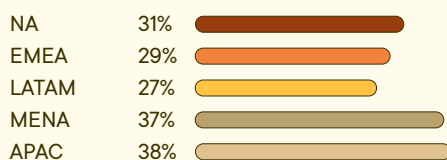
High interest rates



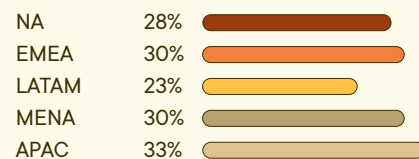
Payments/settlement speed



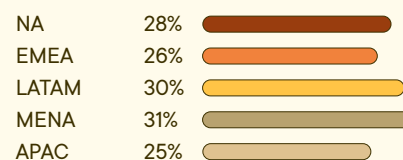
Lack of access to global payments networks/corridors



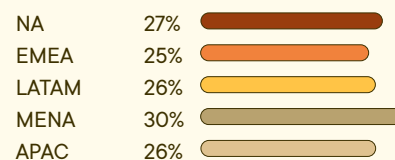
Raising capital/pre-funding requirements



Lack of liquidity



Payment errors





Depending on jurisdiction, regulations and currencies used, other reasons why high interest rates might be a pain point for cross-border payments could include:



Reduced liquidity: High interest rates can restrict the availability of credit and reduce overall liquidity in the financial system, which in turn makes it more difficult for businesses to access funding for cross-border payments.

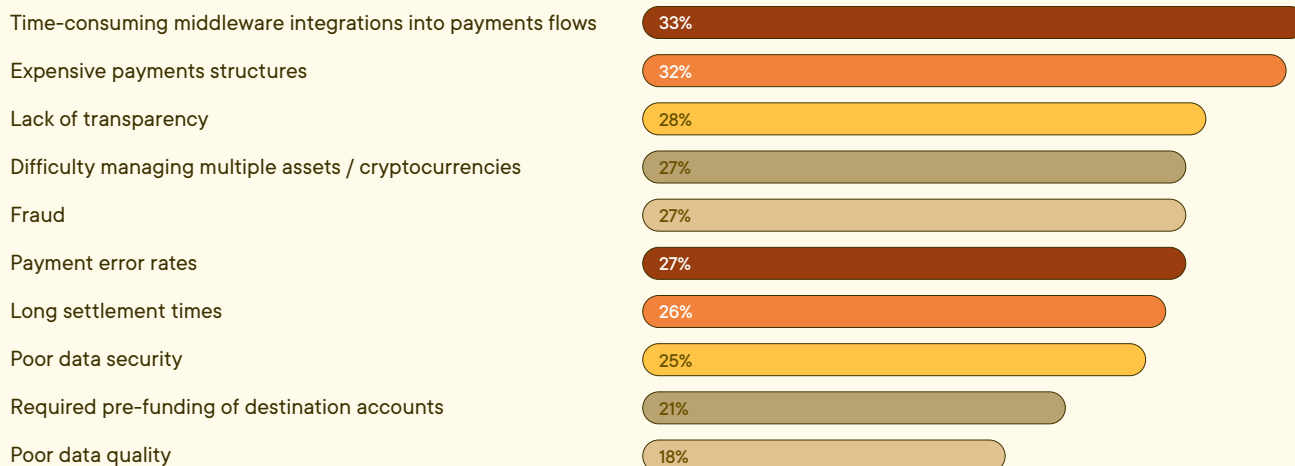


Cost of borrowing: When interest rates are high, it becomes more expensive for businesses to borrow money, which impacts the cost of financing cross-border transactions and makes it more costly to send and receive funds internationally. Additionally, these higher borrowing costs may result in enterprises being less inclined to expand their operations in new markets or engage in cross-border trade.

These are areas where crypto and blockchain technology can help solve for inefficiencies, and it appears global payments leaders are aware. We asked payments and treasury professionals at financial institutions and enterprises which payments-related pain points they believe crypto can help solve for their business. Results were relatively evenly distributed across the options provided, which is perhaps the biggest takeaway here. We can glean that the majority of financial institutions and enterprises around the world are in fact dealing with any number of pain points when it comes to payments, and that generally speaking, they believe crypto can help solve all of them in one way or another.

FIGURE 20

Top Pain Points Crypto Can Solve





Where we saw the most variance was among respondents in MENA (43%) who are particularly enthusiastic on crypto's ability to solve time-consuming middleware integrations into payments flows (treasury management, ERP systems, etc.).

Over half of payments and treasury leaders agree that faster payments/settlement times and cost savings are the biggest value propositions for incorporating crypto into their cross-border payments business. When we break these down by role type, we learn that those in treasury favor cost savings, whereas payments professionals care more about faster payments/settlement times. This was true regardless of level of experience with crypto and across all regions with the exception of LATAM.

FIGURE 21

#1 Value Prop for Incorporating Crypto into Cross-Border Payments

Treasury Professionals

Cost savings

58%

Faster payments/settlement times

48%

Payments Professionals

Cost savings

51%

Faster payments/settlement times

58%

FIGURE 22

Cross-Border Payment Challenges





Digital payment transactions experienced significant growth over the past few years; between 2018 and 2021 the number of noncash retail payment transactions grew 13% CAGR⁵¹. This pandemic era shift toward e-commerce turned even small-and-medium sized enterprises (SMEs) into global businesses.

SMEs—which typically already operate on razor thin margins and are heavily impacted by the global supply chain—have an increasing demand for cross-border payments solutions, but have long been underserved by traditional financial rails. The opportunity is particularly vast in emerging markets where there is over \$100B in potential SME cross-border payments revenue⁵².

CRYPTO CONCEPTUALIZED:

Cross-border Payments Case Study

As the first exclusive foreign exchange bank approved and regulated by the Central Bank of Brazil, Travelex Group is a cornerstone financial institution that enables global payment flows for consumers and businesses across the country.

Travelex has partnered with Ripple to support crypto-enabled payments and provide faster, more affordable transactions for their customers. With Ripple's payments solution, Travelex can settle global transactions in a matter of seconds. Not only do their customers gain the advantage of speed, but also protection from fluctuations in FX rates that may occur using traditional payment rails.

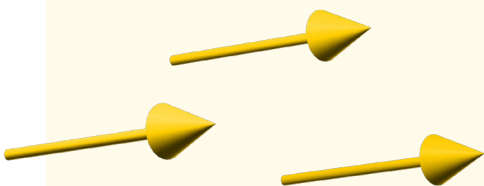
Another core feature of the partnership was the opportunity to expand into new markets and cement their position as a leading institution throughout Latin America.

“

The benefit of working with Ripple in South America is very important to us. **We want to expand, and Ripple's knowledge of surrounding markets** allows us to more easily enter into and work in these countries.

Joao Manuel Campanelli Freitas
Travelex Chief Business Development Officer

”





But in order to tap into this opportunity, payments providers must prioritize a seamless solution. SMEs that are working with fewer resources (human, financial, technical) need things to be easy. They don't have the teams, time or capital required to integrate multiple systems into their tech stack or onboard into two, three, four different tools. In fact, ease of use was the number one most cited requirement for organizations of all types to enable their customers to pay with crypto.

Digging into the data, ease of use stayed at the top of the ranks across financial institutions, enterprises, role types, regions, and crypto and non-crypto users. However, there was one area where it was outranked by another requirement: treasury respondents specifically value no cost fluctuations above all else.

Transforming Treasury

It's no secret that today's current global payments landscape is slow, costly, fragmented and archaic, with the majority of global enterprises still using bank transfers (e.g. wire, ACH) and manual processes to manage and move money across borders via their primary banking partner. Therefore, it's also no surprise that financial institutions and enterprises alike are catching on; taking note of the advantages afforded by crypto and how the technology is driving everyday business value for enterprises and their customers around the world.

FIGURE 23

Institutional Requirements to Enable Customers to Pay with Crypto

% Ranked in Top 2

Ease of use

70%

No security risk

60%

No cost fluctuations

58%

Predictable fiat conversion costs

57%

No volatility risk

56%



One area where this is becoming increasingly prevalent is with internal treasury. Managing various fiat accounts in every country of operation dramatically increases the complexity of treasury management, operations and liquidity. In fact, in 2021 McKinsey estimated \$3.5B in annual global corporate spend to solve treasury and liquidity issues⁵³. Compounding this is the fact that companies have to pre-fund foreign destination accounts, which ultimately traps working capital in nostro and vostro accounts that could otherwise be put to use elsewhere.

Blockchain and crypto can help solve these challenges by eliminating the need to pre-fund accounts and enable faster real-time settlement, both of which provide greater access to liquidity. With improved tracking and transparency over the flow of funds (without tying up working capital), and access to always-on, 24/7/365 markets that never close, treasurers aren't confined to traditional banking hours, nor do they need to wait days or even weeks for payments to settle. Faster cross-border payments—even into notoriously complex corridors like India, Mexico and Southeast Asia—that don't require pre-funding accounts can enable treasury teams to improve cash flow planning, enhance commercial terms, help suppliers factor their receivables, expand into new markets, and more.

\$3.5B

Annual global corporate spend to solve treasury and liquidity issues

Our study complements these sentiments. The vast majority of treasury respondents believe crypto will have a significant or massive impact on finance (88%) and business (84%) in the next three years. Further, half say that their organization is extremely willing to enable customers to pay with crypto. And when asked about the likelihood of their organizations adopting CBDCs, stablecoins or cryptocurrency in the next 3 years, 60% said “very likely.”

Unlike their payments counterparts, we learned that treasurers—particularly those in LATAM—care more about cost savings as a key value proposition for incorporating crypto into their cross-border payments business.

For corporate treasurers that need to move funds into and out of complex corridors like Mexico, India and Southeast Asia, this task becomes exponentially more challenging due to lack of FX and capital flow. Even traditional banking partners often find it difficult to provide the capital and funding needed for companies to pay employees, vendors/suppliers, or collect revenue from these markets.

Treasury operations as we know them today lack real-time, automated, transparent payments—causing pain points associated with speed, security and efficiency for both employees and customers⁵⁴.

Crypto offers new ways to enhance traditional treasury management, including:

- Simple, real-time, secure money transfers
- Better control over capital
- Manage risks and opportunities of digital assets
- Reach a new clientele and grow the volume of sales transactions



Despite these advantages, many treasurers are still averse to holding crypto, in large part due to price volatility (50%) followed by highly restrictive regulation (44%), as our research indicates. So, those treasurers who want to realize the benefits afforded by the technology, and transform treasury operations while keeping crypto off the corporate balance sheet, require a different entry point into the use of digital assets, i.e. through a trusted third party provider.

The third party vendor manages the technical, risk, compliance, and controls issues on behalf of the customer.

The third party vendor accepts or makes payments in crypto through fiat conversions, enabling a hands-off approach for the customer⁵⁵.

FIGURE 24

Perceived risks of using crypto for payments

% Ranked in Top 2 Pain Points

Price volatility

50%

Unclear regulation

42%

Highly restrictive regulation

41%

Unsecure technology

39%

Bad actors

29%

Barriers to Adoption

Clearly, crypto affords a ton of opportunity, but it doesn't come without challenges. As with any burgeoning technology, there are certain levels of risk that need to be weighed. And of course where the flow of funds is involved, it's to be expected that organizations have their hesitations. We wanted to find out what these were among both financial institutions and enterprises to get a pulse on what might be stopping those businesses from using crypto for payments. Here is what we found.

In total across all respondents, price volatility ranked as the number one risk. This is true across financial institutions, enterprises, regions (with the exception of MENA where respondents ranked "highly restrictive regulation" slightly higher) and those in roles related to digital transformation, institutional banking, treasury, compliance and innovation. Interestingly, this is also true for respondents regardless of whether or not their organization already has a cryptocurrency solution planned or in production. This is likely reflective of recent market turmoil and the ebbs and flows in the price and market caps of various cryptocurrencies.

There are ways that enterprise-grade, institutional-level solutions can protect customers from price swings. One way to solve for volatility risk in payments is for the payments provider to guarantee an exchange rate at the onset of a transaction. Take Ripple's payments solution as an example—should the price of any given cryptocurrency or digital asset change during the 3-5 seconds it takes a payment to settle, Ripple automatically absorbs that change and the customer is unaffected.

Other primary risks associated with crypto for payments are around regulations either being unclear (42%) or highly restrictive (41%). This is in line with other research we have conducted, where regulatory clarity was the single most cited barrier to adoption of crypto-enabled payments⁵⁶.

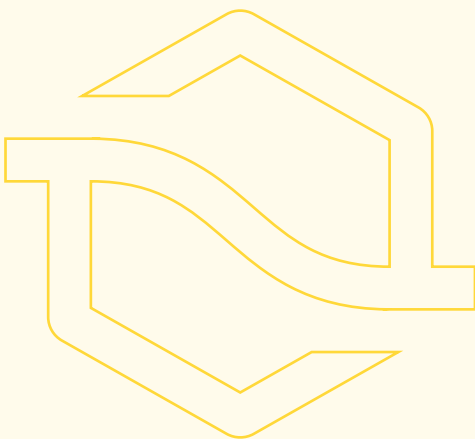


Close

When it comes to crypto-enabled payments, it's no longer a question of if, but when, for financial institutions, enterprises, and their customers. Whether for internal treasury, lending/borrowing, accepting donations, or payroll and distribution, there aren't many areas where crypto isn't currently being used for payments or will be in the near term.

In order for multinationals to retain customers, grow revenue, and gain a competitive edge in today's always-on economy, they need access to seamless, more cost-effective cross-border payments and real-time settlement. Ideally, these solutions can address and protect against key pain points like costly payments and high interest rates, and provide access to greater liquidity and new markets to allow their customers to grow and scale.

While solutions providers can certainly offer faster, better ways of moving value, more widespread global adoption of crypto for payments hinges on regulatory clarity. Promisingly, progress has been made in many countries and regions around the world, including the UK, EU, UAE, Japan, Mauritius, and Switzerland⁵⁷. At the country or union level, governments and policymakers must continue to come together and agree on a clear path forward for how and when to regulate crypto. Without it, we are inadvertently stifling further progress and innovation.





A Note on Compliance

While we didn't report on compliance as part of this year's study, it's a core component to the Internet of Value and will ultimately pave the way for financial institutions and their enterprise customers to interact with crypto and DeFi. Therefore, we wanted to include a note on the current and future state of crypto compliance, barriers and challenges within the current landscape, and what's on the horizon for financial compliance professionals.

Compliance has been—and continues to be—a key issue for financial institutions evaluating crypto and blockchain technology. It's estimated that the financial industry spends roughly \$181 billion per year on financial crime compliance⁵⁸.

If we learned anything from 2022, it's that the crypto industry needs clear compliance requirements. With all the varying rules and regulations for crypto companies to adhere to (KYC/AML, disaster recovery, sanctions, privacy, vendor risk management, consumer compliance, etc.), this begs the question: How can other companies entering the space navigate the ever-evolving compliance landscape?

Current and Future State

Financial crime compliance regulations are a moving target. According to a recent report from LexisNexis, over 50% of global payments executives at corporations and financial institutions think financial crime compliance is very challenging and 16% say it's extremely challenging⁵⁹.

As noted in the previous section, we also learned that most enterprise respondents plan to leverage crypto technology to enable customers to make and accept crypto payments. So as more and more companies adopt crypto, they will also be expected to navigate the various crypto compliance regulations (or lack thereof) in different jurisdictions—including if they need to comply, and if so, what they need to do in order to meet those requirements. This likelihood of more widespread adoption of crypto will undoubtedly demand clearer guidance and a more seamless compliance process.

Barriers and Challenges

The global compliance landscape today is highly fragmented and segregated, with different processes, timelines and licensing requirements across jurisdictions. In fact, regulatory compliance is a top challenge for 66% of payments executives at leading corporations and financial institutions worldwide⁶⁰.

Compounding this is the fact that the broader DeFi market is largely unregulated (or subject to uncertainty), and major players like HSBC and BNY Mellon want to enter the crypto space but are treading lightly due to the uncertainty around DeFi protocols and where compliance fits into the equation.

And as we learned in other areas of our study, price volatility was the single most cited risk of using crypto for payments. In order to adopt institutional DeFi, financial institutions need to be protected from market volatility to help mitigate financial risk.

\$181B

Estimated financial industry spend per year on financial crime compliance



Relieve for Compliance Leaders

By pre-programming compliance rules like Know Your Customer (KYC), Anti-Money Laundering (AML) Transaction Monitoring (on-chain and off-chain) and sanctions screening, blockchain has the power to reduce the risk of error and make it more cost effective and easier to manage complex compliance requirements. In turn, this can help enable more financial institutions to offer an on-chain DeFi solution to their customers.

Positive and progressive movements also came out of 2022, including on-chain compliance regulation and analytics firms gaining more attention with a few large investment rounds. And global legislation gained more positive traction in countries like Brazil, where congress approved a bill to regulate the use of digital currencies for payments within the country; and Morocco, whose central bank is finalizing a crypto governance framework. Favorable crypto regulation is also expected to come soon from India, Germany, Australia, the UK and others⁶¹.

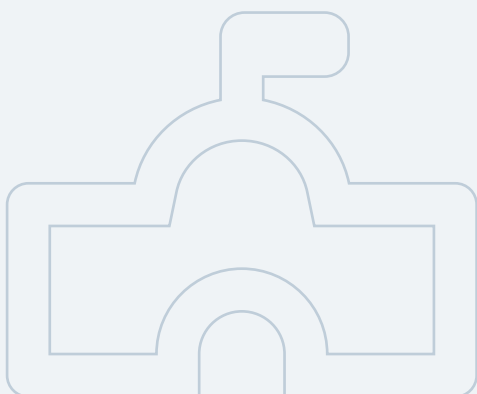
Given broader global trends of crypto regulation gaining traction, it appears that much-welcomed relieve is on the horizon for compliance professionals.



Close

We believe the importance of these regulations and requirements will only increase as more assets are tokenized, more financial institutions begin incorporating crypto into their business, and customer demand for faster, better payments continues to rise.

As crypto and blockchain continue to enter the mainstream, and common misconceptions are cleared up, so too will compliance requirements and regulations.





Conclusion

The vast majority of global finance decision makers (upwards of 88%) believe that crypto and blockchain technology will have either a significant or massive impact on business, finance, and society over the next three years—not over a decade, not down the road, but by 2026. Perhaps even more promising is the fact that 100% of respondents at financial institutions in roles related to innovation stated as much. While not surprising given the nature of their particular job function, this only further cements crypto's promise within the broader financial sphere, which is ripe for innovation.

Today's financial system is inefficient, opaque and unfair, which has resulted in inaccessibility, inefficiencies, and high costs. More than 25% of the world's population lacks access to basic financial services, cross-border transactions take days (if not weeks) to settle, and costs are orders of magnitude higher than they could be using blockchain and crypto technology.

The total addressable market (TAM) in finance use cases like lending and borrowing is in the dozens of trillions of dollars, with current institutional DeFi penetration of that market opportunity capturing less than 0.1%. Finance is the single biggest field of untapped opportunity for blockchain technology.

And while this past year saw the fall of major financial players like FTX, Three Arrows Capital, SVB and others, it also experienced a rise in CBDC pilots, increased adoption of crypto-enabled payments, and the ever-evolving real-world utility of tokenization transcending industries. Even more, companies like Ripple are building solutions that bridge these technologies and their applications into holistic, interoperable solutions that are easy to integrate and simple to use. In doing so, organizations and their customers are able to interact with crypto and DeFi in a safe, secure and compliant way, while simultaneously deepening customer engagement and brand loyalty, opening up additional revenue streams, and tapping into global markets and new opportunities.

When we look back at where crypto and blockchain were a year ago and where we are today—given the accelerating pace of innovation and powerful signs of adoption—we can't help but agree that these technologies will have profound impact in the months and years to come. And, with clear regulation and applicable compliance guidance across jurisdictions, we will undoubtedly see newfound functionality and applications of the technology emerge. We look forward to exploring those as we continue our work together building the Internet of Value.

The total addressable market (TAM) in finance use cases like lending and borrowing is in the dozens of trillions of dollars

with current institutional DeFi penetration of that market opportunity capturing less than 0.1%. Finance is the single biggest field of untapped opportunity for blockchain technology.



The Token Lifecycle in the Internet of Value

What does the lifecycle journey look like for a tokenized asset?



Tokenize

An asset/ownership rights of that asset are converted into a unique digital unit to represent its value on the blockchain

80+%

Global finance leaders think NFTs will have big impact on:

- Trading tokenized assets like stocks and bonds
- Buying and selling real estate
- Derivatives and carbon markets

\$18B

Total market size of all tokenized assets⁶²



Manage

The token can then be used to trade, transfer ownership, make a payment, lend/borrow, etc. via an exchange or marketplace leveraging DeFi protocols

\$50B+

Total DeFi market cap in Feb 2023⁶³

66%

Enterprise finance leaders are familiar with using DeFi to trade, borrow or lend tokenized real-world assets



Move

With increased liquidity, the token's value can be used as a form of digital currency and moved around the world, in real-time, 24/7/365

\$250T+

Expected cross-border payments value by 2027⁶⁴

Compliance checks and decentralized identity apps for KYC/AML

The token of the tokenized asset can also be redeemed, and the holder obtains the physical or digital asset that is providing the token's underlying value



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