



CRYPTO LENDING 101

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January 2020

CONTENTS

Introduction	3
Why should we care?	4
Will lending break bitcoin's supply cap?.....	4
Will interest rates change the nature of bitcoin?.....	4
What about systemic risk?.....	4
The marketplace	5
Lenders and borrowers	5
Lending platforms	6
How it works	8
Crypto lending vs traditional lending	8
Variety and speed.....	9
Collateral.....	9
Regulation	9
Importance	10
Benefits.....	10
Risks	10
Network security.....	11
Outlook	12
Banks coming in.....	12
Regulation	12
Technology developing.....	13
Looking further out.....	13
Conclusion	15

INTRODUCTION

The lending of money is one of the principal motors of the modern economy. Ever since debt first started to be used as a facilitator for trade thousands of years ago, it has been seen as an essential lubricant for commerce and investment, and entire industries now revolve around this exchange of present and future value. Over the years hundreds of thousands of businesses, services and products have sprung up to make lending smoother and safer, leading to a complex web of collateral and obligation, with varying degrees of transparency.

It was only a matter of time before the practice seeped into the crypto market. As early as 2010, threads started to emerge on the BitCoinTalk¹ forum that mused about setting up “bitcoin banks,” and not long after, individuals started offering P2P lending services to extract a return on their holdings.

The sector has since evolved to include a range of businesses, some now well-established and many trying to get off the ground, with a range of services covering a broadening array of assets. Sector data shows considerable growth in demand for these services, which in turn are adding depth and complexity to an already complicated concept.

Lending and borrowing in bitcoin have many advantages, as we shall see below. These advantages could attract new users and help the entire ecosystem grow. The introduction of lending, however, can also add systemic risk, and could change the very nature of the underlying assets. Will the benefits outweigh the potential vulnerabilities?

In this report, we aim to introduce the concept of crypto lending: who participates, as well as the advantages and risks of crypto lending. We also look at what the near future could hold for the service, and the impact this could have on the sector as a whole.

To see our other introductory reports in the series, visit our [Research Page](#).

¹ <https://bitcointalk.org/index.php?topic=249.0>

Vocabulary: *crypto lending*

When we say “crypto lending,” we really mean “crypto-secured lending,” as not all loans are denominated in crypto assets. Holders of crypto assets will often use their positions as collateral for cash loans, for investment or working capital purposes.

WHY SHOULD WE CARE?

In traditional finance, lending mainly originates with banks. They collect deposits from savers, bundle them together and then, reserving some in case savers wish to withdraw, lend the deposited money out to borrowers.

Crypto doesn't (yet) have banks in the traditional sense, however. There is no regulated entity that has a license to take in crypto deposits and then lend them out. In fact, bitcoin—to use one example—was created to obviate the need for banks: no authorization is needed to send a payment in bitcoin from one holder to another, and each holder is responsible for the custody of his or her coins (although this can be delegated at the holder's discretion). What role would a crypto bank play in a sector that doesn't need it?

Given the proliferation of custody services, it seems that there is a demand for centralized banking functions, even in a decentralized ecosystem. It therefore shouldn't be a surprise that this extends to the need for deposits and lending.

Yet lending is a much more complicated function of traditional banking than asset safe-keeping—not as necessary (you don't have to lend out your assets, but you do have to keep them somewhere), but more transformative.

For instance:

Will lending break bitcoin's supply cap?

Will bitcoin lending, for example, break the cryptocurrency's hard cap by effectively increasing the supply? Obviously, the actual amount of bitcoin cannot increase, the protocol caps it at 21 million. But claims on existing bitcoin could start to stack up as collateralized holdings get re-collateralized, and as the financialization becomes more complex. For now, that's unlikely, as loans are generally more than 100% collateralized—but as the sector matures, this could change.

Will interest rates change the nature of bitcoin?

Will interest rates on bitcoin affect its suitability as a substitute to gold, which has none? Bitcoin has so far been one of the very few "real assets" available to investors: assets with no cash flow and no "fundamental value" beyond what the market assigns. The emergence of yields and cash flows could change bitcoin's role in portfolios.

What about systemic risk?

Will the proliferation of leverage in the system—with crypto assets being used as collateral for loans which are then used to buy more crypto assets—add a worrying amount of systemic risk? Would investors be able to unwind layered positions with sufficient speed in the event of a downturn? Would that cause some of these platforms to collapse, exacerbating market unrest? Or would the additional liquidity the leverage would bring enable capital to flow in and out of crypto markets more easily?

And what about on-chain lending, one of the fastest-growing areas of what is known as "decentralized finance," or "DeFi"? Could it replace centralized lending? Might it change the incentive structures of blockchain governance? What about the potential technological and financial risk?

To begin to understand these questions and their potential answers, let's take a closer look at the crypto lending marketplace.

THE MARKETPLACE

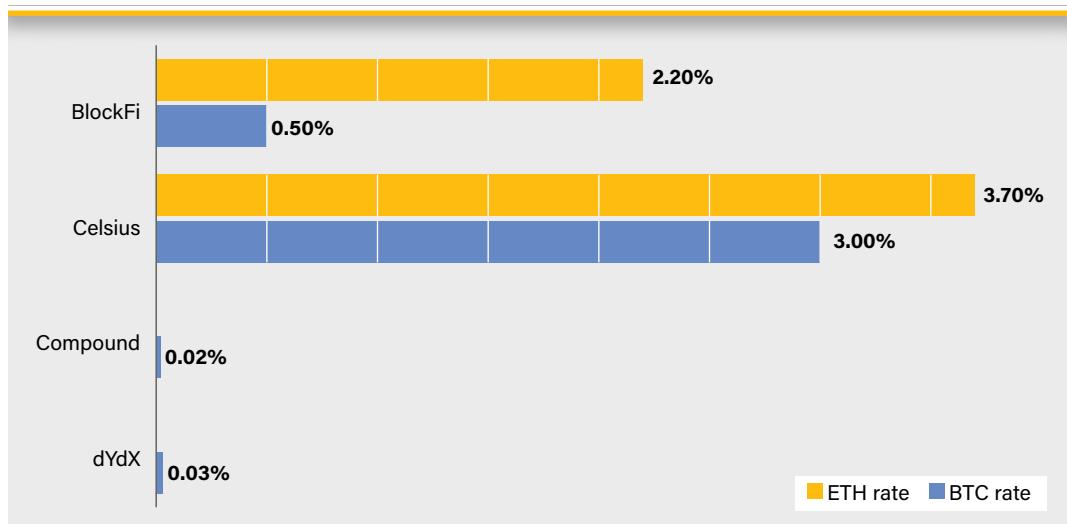
Lenders and borrowers

Before we discuss the “middlemen” in the sector—the lending platforms—let’s take a look at the users of the service.

1) Crypto lenders: holders who wish to earn a yield on their crypto assets. These could be individuals or funds who wish to supplement any potential capital gain and are willing to forgo the flexibility of being able to trade their holdings.

According to industry insiders, some investors go long crypto assets just for the yield, protecting against price downside in the derivatives market.

Figure 1. Crypto lenders & DeFi interest rates on deposits, Dec. 11, 2019



Source: [BlockFi](#), [Celsius](#), [Compound](#) and [dYdX](#)

2) Cash lenders: holders of excess cash who are willing to accept crypto assets as collateral. This has both advantages and disadvantages compared to traditional cash lending (see sidebar on following page).

Most lending in the sector is currently of crypto assets such as bitcoin, ether or stablecoins. However, demand for cash borrowing is growing, as holders increasingly wish to unlock the value of their crypto assets without selling them. Supply of cash lenders, however, is still relatively constrained.

3) Crypto borrowers: usually individuals or firms who wish to trade or make markets in crypto assets. OTC desks, for example, may need to borrow in order to satisfy a large buy order immediately, giving them time to source the asset in the market without moving the price. A trader may need to deposit crypto on an exchange in order to begin accumulating more crypto. Traders also often borrow to take advantage of arbitrage opportunities—executing a quick sale with borrowed assets is often more profitable than dashing into the market to buy before selling.

An oft-cited use for borrowed assets is selling them short. A trader or investor that believes the market price will go down can borrow an asset, sell it in the market, and then buy it back

Cash lending in crypto markets: the advantages

For holders of excess cash, lending in the crypto markets, with crypto assets as collateral, has some advantages over lending in traditional markets. Supply is still relatively constrained, however.

Holders of excess cash have many alternative sources of yield to choose from—they can invest in securities, or they can lend via traditional P2P platforms, without incurring the additional risk of accepting crypto assets as collateral.

The peculiar nature of crypto assets, however, could end up one of the sector's selling points for cash lenders.

In traditional P2P lending markets, collateral is often held by the borrower or a third party on lien—the lender only takes control if the borrower defaults, and this could be a slow and costly process. In crypto lending, however, asset collateral is often sent directly to the lender. The bearer

nature of the assets means that collecting on default is not an issue, and the lender can rehypothecate the assets meanwhile.

This makes crypto-backed cash lending more like the repo market, in which highly liquid assets are exchanged for cash for a fixed term at nearly 100% of face value, than the traditional asset-backed lending market.

A further enticement for cash lenders is that the loan-to-value ratio is relatively low, sometimes below 50%, which means that the lender gets a much greater amount of crypto asset value than the cash lent out—value which the lender can put to other uses. Also, most crypto assets are more liquid than many other types of accepted collateral such as real estate, and can be sold with relative ease should the loan-to-value ratio deteriorate due to market conditions.

at a lower price when time comes to repay. Some industry insiders² insist that this type of demand is lower than expected, however, as using the futures markets to profit from a negative outlook is a much easier proposition.

4) Cash borrowers: holders of crypto assets who need to raise cash, either for business (working capital) or investment purposes. These could be individuals who need cash but are concerned about the capital gains tax that would result from the sale of their assets, or who would rather not give up on potential capital gains.

Last year, for example, controversial bitcoin investor Brock Pierce used part of his holdings for a mortgage on a property in Amsterdam.³

Cash borrowers could also be ICO issuers with a significant amount of ether or other crypto asset in treasury, who need to raise working capital to pay operating expenses.

Lending platforms

While there is a variety of business models, crypto lending platforms can be divided into two main camps: centralized, which are generally businesses that selectively onboard clients, manage payments and custody assets; and decentralized, which are largely protocols that automate distributions and allocations.

1) Centralized: entities that handle the selective onboarding of users and the exchange of crypto assets and cash, usually on a custodial basis.

These could be:

- dedicated businesses, such as Genesis Capital, Unchained Capital, BlockFi and Celsius (this list is not exhaustive);
- OTC desks that aim to maximize the efficiency of their crypto positions while offering easier trading conditions for their clients;

2 ["On the Brink"](#) podcast interview with Dan Matuszewski, December 2, 2019

3 Leo Jakobson, ["Brock Pierce buys a million-dollar home with a crypto-backed loan,"](#) modernconsensus.com, April 4, 2019

- exchanges that use margin lending to attract users
- platforms such as Tagomi that aim to centralize margin trading opportunities across a range of exchanges.

Some platforms, such as Celsius and Nexo, have issued tokens that confer perks such as discounts and revenue sharing with holders.

Data on outstanding loans originating at centralized platforms is relatively opaque. All firms are private (for now), and public disclosure is voluntary.

Genesis Capital, one of crypto's largest lenders, issues a quarterly report⁴ disclosing figures that give some insight into the sector's evolution. In Q3, their loan originations were up 250% in Q3 2019, bringing the total lent since March 2018 to over \$3 billion.

2) Decentralized: protocols that rely on smart contracts to automate the distribution of loans and interest payments. These focus exclusively on crypto assets, and are generally non-custodial, distributing assets directly to customers' wallets.

Examples include Maker, Compound and ETHLend. Some, like dYdX, are integrated with decentralized trading platforms.

Users of these platforms are usually individual traders attracted by the returns, and developers who want to experiment with the technology.

Data for decentralized lending is more transparent than for centralized, as the transactions are recorded on public blockchains. Some data providers that focus on this subsector are LoanScan, DeFi Pulse and Defi Stats.

According to DeFi data platform LoanScan, over \$600 million on-chain loans were issued in 2019. While comprehensive data for centralized platforms is hard to come by, combining the self-reported figures as well as the on-chain figures for deposits shows the growth in the sector over the past year.

DeFi lending soared in 2019, drawing ethereum investors during a bear market. This circular pattern points to its popularity among investors who are already planning to hold ether for the long term, and raises questions as to what DeFi projects must do to grow beyond that population of early adopters.

4 <https://genescap.co/insights/view-q3-insights-2019/>

Loan origination metrics

Loan originations give an overall view of sector growth, but the actual numbers are not particularly meaningful as they are materially affected by the term of a loan (short term loans are given the same weighting as long term loans, inflating the actual value—for instance, a 1-day loan rolled over seven times provides 7x more loan originations than a week-long loan for the same amount).

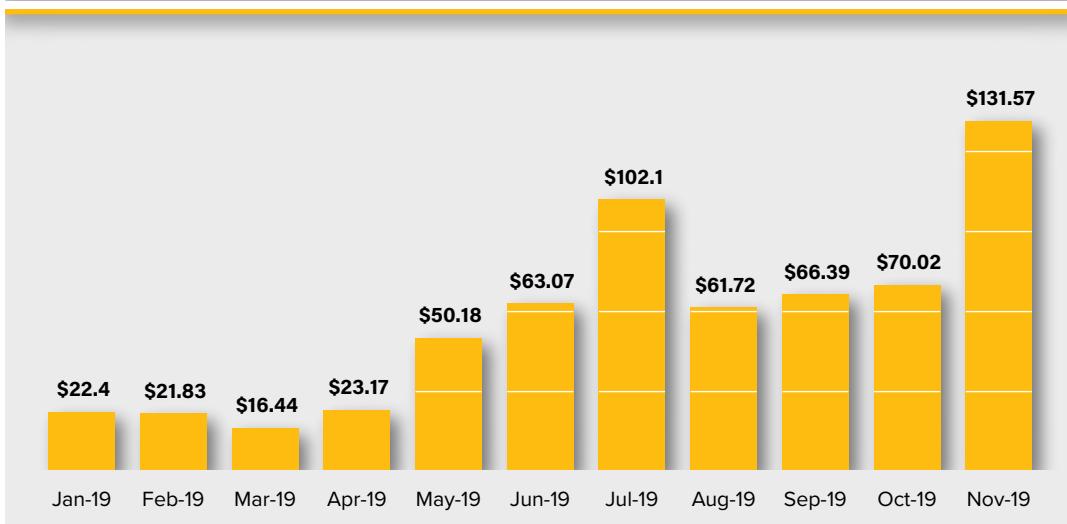
Also, loans are usually reported in US\$, even though they may be issued in a cryptocurrency, which can fluctuate in value. This is the most convenient unit of account to use, but it does distort the total amount.

HOW IT WORKS

Crypto lending vs traditional lending

Crypto lending is markedly different from traditional lending. It's not just the innovation in the technology powering smart contracts, or the new types of assets that can be collateralized.

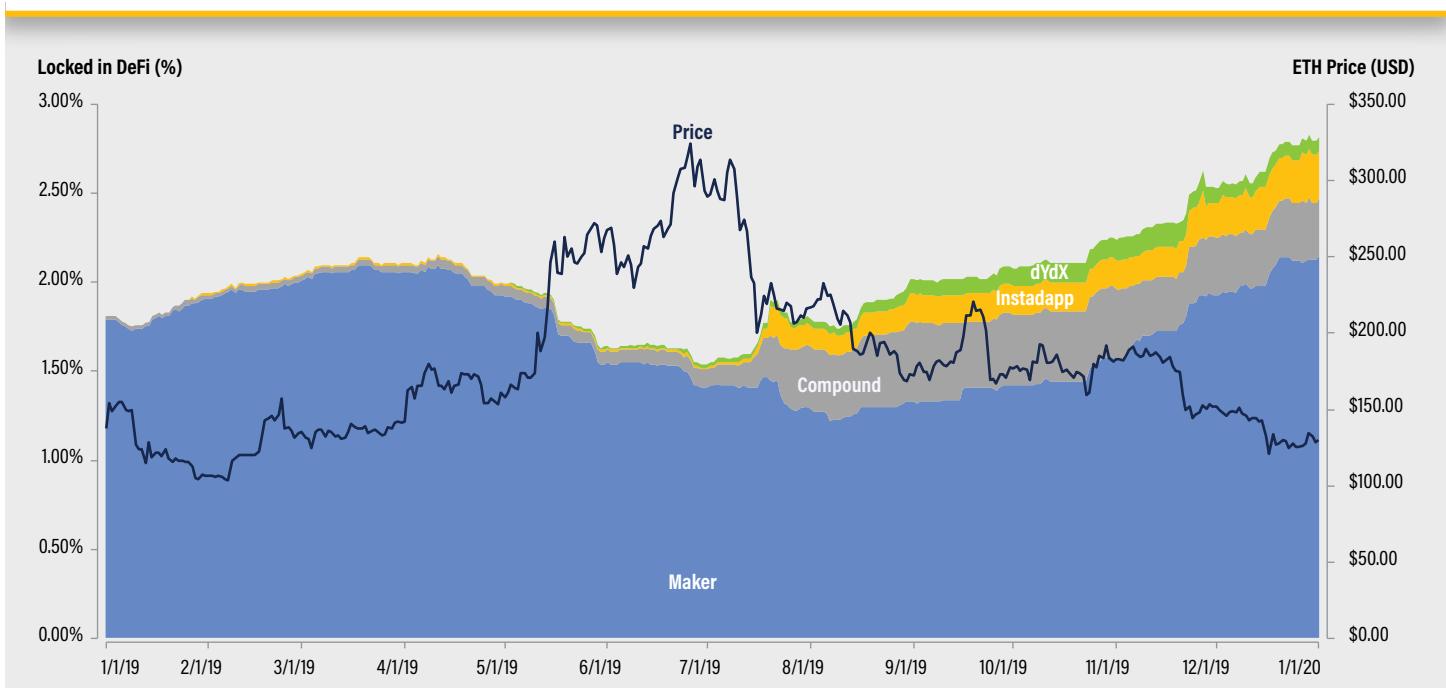
Figure 2. Defi Loans originated vs. time (\$ Mill.)



Source: [Loanscan.io](#)

The sector also stands out for the flexibility and relative security (yes, really) of credit. Let's look at some of the operational differences.

Figure 3. Percentage of ETH locked in DeFi lending platforms vs. time



Source: [DeFi Pulse](#), [Coin Metrics Network Data Pro](#), [CoinDesk Ethereum Price Index](#)

Variety and speed

First, crypto lending involves a much wider range of assets, which confers flexibility on market participants. Few traditional finance platforms offer yields on such a wide range of assets. While it is possible to lend various types of traditional securities, and submit an even broader range of assets (including real estate and art) for collateralization of a loan, the lending of crypto assets involves less paperwork, fewer middlemen as well as lower (and generally more transparent) fees.

Users of lending platforms, both centralized and decentralized, can switch between assets with relative ease, depositing bitcoin (for instance) in order to take out a stablecoin loan, or using their ether stake for a bitcoin loan that enables them to fund an exchange account in order to buy more ether. This can be done in seconds.

Collateral

Collateral deposited for loans from these platforms is always in crypto assets, which are more liquid than many types of collateral in traditional markets.

What's more, for now most platforms insist on collateral of over 100%, sometimes as much as 150%, to offset possible asset price volatility. Given the relative liquidity of these assets (compared, say, to yachts and jewelry), should the market turn south and the loan-to-value ratio decline, lenders could sell the collateral in the markets. This would in theory stem their potential losses (although possibly accelerate the slump).

Regulation

For now, crypto lenders are not considered banks, and do not need special licenses. While this may be a deterrent to many potential participants due to a lack of trust, it allows lending businesses to focus on building a strong reputation through service and selective transparency.

It also allows them to keep costs down for users, as reporting requirements are low.

IMPORTANCE

The emergence of lending services brings both benefits and risks to the sector. Let's take a look at each.

Benefits

Obviously, few will object to the additional income that lending could bring to crypto asset holdings. Lending services enable holders of crypto assets to supplement the capital gains potential with interest income. This, combined with the relatively attractive yields on crypto assets compared to those on more traditional assets, could entice a broader range of investors into the crypto asset class, boosting volumes as well as strengthening liquidity and infrastructure.

Another benefit is the increased facility for selling short, in which a pessimistic trader borrows an asset to sell on the market with a view to buying it back at a lower price. The ability to short an asset is important for reliable price discovery—if those that think the price will go down don't have a way to participate in a market, the market will reflect a buyer's bias. A lively derivatives market is one way to express a negative opinion; selling short is another, and could become a more extended use case as platforms adopt features that make it almost as simple as trading futures.⁵

Perhaps the strongest benefit to the sector comes from additional liquidity. Many traders and investors deposit their crypto holdings as collateral in order to borrow either cash or another crypto asset, with which to increase their crypto holdings. This effectively introduces leverage into the sector, but enhances liquidity through the additional trading.

Risks

Among the risks posed by the growth of crypto lending services is the "over-financialization" of the market. While crypto lending shouldn't actually increase a token's supply, the emergence of layered claims on a holding, and the issuance of securities based on those claims, could blur the bearer nature of crypto assets and the rights of the original holders.

Another risk, present in all centralized financial services, is that of counterparty default. Crypto lending platforms are as yet unregulated and uninsured (although many have custody insurance). The collapse of a significant lender would send ripples of doubt throughout the system, as actual ownership and eventual recovery of deposited tokens would be unclear.

With decentralized platforms, transparency can also be a risk. On-chain lending implies that others will be able to see transactions, and even if identities are masked, forensics could uncover them as well as trading strategies, information which can be taken advantage of.

And smart contracts that move funds and manage investment contracts are a relatively new technology—errors can most likely be patched, but meanwhile funds can be misdirected, and if these transactions are registered on a blockchain, the errors may be impossible (or politically very difficult) to correct.

Regulation is also a potential threat to the sector. The term "investment contract," even if it is in the form of a string of code running on a decentralized protocol, means that regulators will most likely start to pay attention to DeFi risks if the sector takes off.

⁵ Celia Wan, "[Crypto broker Tagomi launches lending and borrowing services to facilitate short selling](#)," theblockcrypto.com, September 12, 2019

Even centralized platforms may find themselves required to improve their transparency, which will increase costs and business risk as their terms and conditions become easier to replicate. Furthermore, most of the main platforms delegate the safe keeping of their clients' assets to reputable crypto custodians with insurance, but others may find themselves required to change their practices to ensure the protection of users' funds.

Network security

Another potential risk, outlined in a recently released research paper,⁶ is that posed to block-chain governance structures by the growth in on-chain lending.

In Proof-of-Stake (PoS) blockchains, token holders can participate in a network by "staking" holdings in exchange for a role in its governance and maintenance. The greater the number of and dispersion in stakers, the greater the network's security.

If on-chain lending offers a better financial return, users will choose that over staking privileges—this would thin the ranks of stakers, reducing a network's security. This could even be "gamed" by an attacker, who could intentionally lure token holders away from staking rewards and take advantage of the lower security to effectively "take over" the network.

Lending could also affect governance issues in other ways, such as allowing a bad actor to borrow large amounts of a staking token to attempt some kind of majority voting attack on a network.

Alternatively, staking could perhaps one day offer enough yield to compete with lending platforms, which could weaken some business models and further concentrate the sector.

⁶ Tarun Chitra, "[Competitive Equilibria Between Staking and On-Chain Lending](#)," December 2019

OUTLOOK

What changes are we likely to see to the crypto lending sector in the near future?

Banks coming in

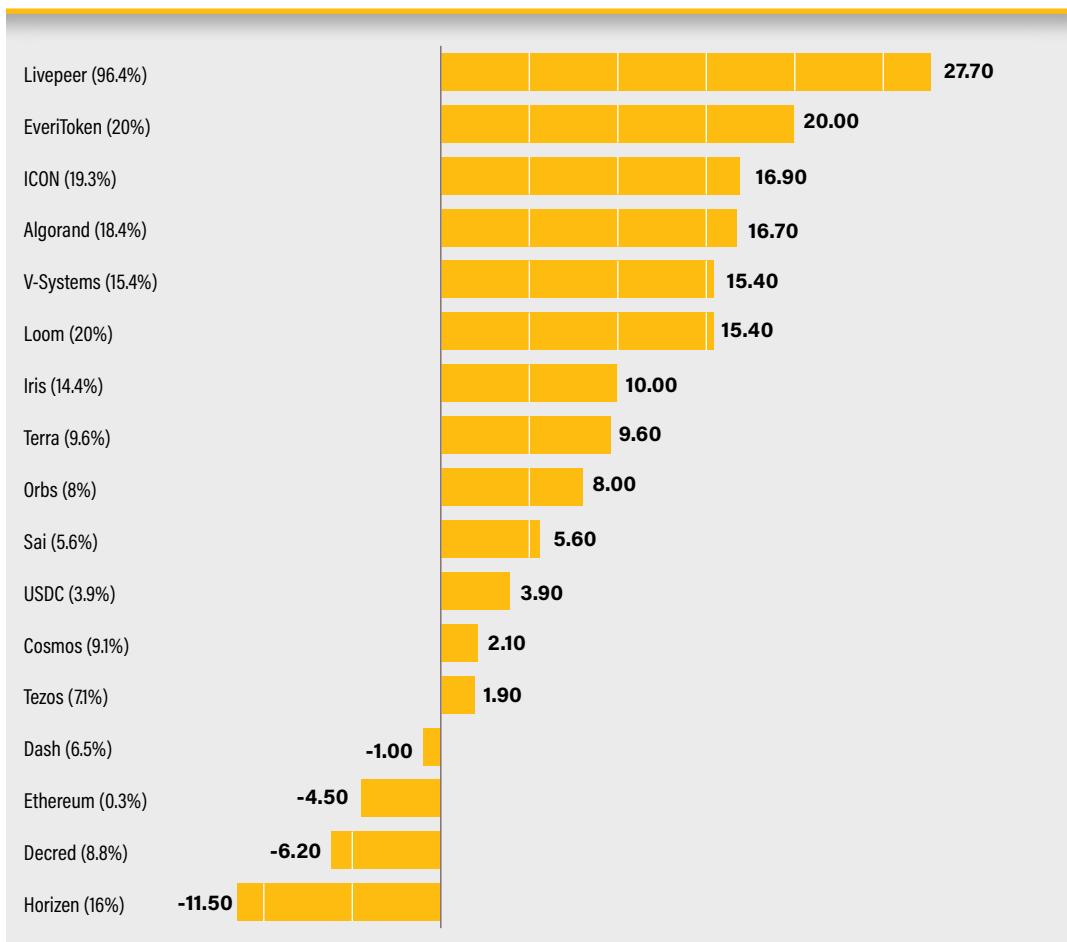
One likely scenario is that traditional banks will take an interest. With rates on fiat loans at historically low levels, banks are seeing their lending margins squeezed. The attractive yield spreads in crypto assets, and the increasing demand from their clients for this service, may convince some institutions to overcome their current reluctance and start offering crypto custody and lending.

In a statement issued in December 2019, the Basel Committee (see sidebar), recognized that banks are likely to start offering crypto asset services, and that risk management regulation may be required.

Regulation

As the sector grows, regulators are likely to take more of an interest in protecting users. This could take the form of licensing requirements for lending platforms, which would require

Figure 4. Staking assets (nominal yield) by real yield, Dec. 12, 2019



Source: staked.us/yields

Note: The spread between nominal and real yield can vary widely between crypto assets, depending on issuance schedule. A more inflationary issuance schedule will widen the spread.

rigorous onboarding, data gathering, balance sheet disclosures and the holding of sufficient reserves.

It could also involve the harmonization of lending conditions, as more rigorous transparency rules would encourage interest rate convergence.

Technology developing

As we mentioned above, smart contract technology is still relatively new, and not immune to glitches. Testing software is likely to improve, however, and collective experience could make platforms more resilient to bugs and hacks.

Scalability is also an issue with the main DeFi blockchain, ethereum, which for now limits the potential growth of the sector. The eventual launch of Ethereum 2.0, however, when the network moves to a more scalable consensus system, will help to remove this barrier, as will ongoing work on other blockchains.

Looking further out

DeFi is likely to continue to be a niche segment for the near future, but could end up influencing centralized services through a creative application of smart contracts.

The result could end up being a hybrid mix, offering centralized assurances with decentralized functionality, and the stamp of approval of regulatory oversight. As if the yield differential between crypto and traditional assets wasn't enough, the collateral flexibility and (relative) security discussed in this report could entice more institutional players to enter the space.

This will not only boost liquidity in the sector as a whole, which in turn could reduce volatility, support robust infrastructure development and attract even more investors.

It could also herald the emergence of sector-wide asset-specific interest rates.

These can, in turn, fuel the development of new types of derivatives, such as interest rate swaps.

Banking Regulations

The Basel Committee on Banking Supervision, formed in Switzerland in 1974 by a group of 10 central bank governors to oversee cross-border settlements for the global banking system, has expanded to include representatives from 28 nations,* and these days is the international rule-setter for banks worldwide.

On December 12, 2019, it published a discussion paper** that reiterated previous statements expressing concern about the potential risks posed by crypto assets.

In the paper, the Committee references crypto markets' growth and potential impact on financial stability. It also recognizes that banks are likely to

hold crypto assets at some point, as well as offer related services such as custody and lending.

The discussion paper invites comments from the banking industry before the middle of March 2020, on whether or not global rules governing crypto activities such as lending by banks should be established, and if so, what they should be.

If banks become part of the crypto landscape, it will further institutionalize an asset class built outside the banking sector. Greater regulatory acceptance and institutional involvement may be a necessary and beneficial step to spread adoption of crypto assets.

* Bank of International Settlements, "[History of the Basel Committee](#)"

** Basel Committee on Banking Supervision, "[Designing a prudential treatment for cryptoassets](#)"

They also could encourage the development of robust valuation models. In traditional finance, interest rates are a fundamental part of asset valuation. Many investors have stayed away from the crypto sector because of the difficulty in valuing its assets. With the emergence of recognized interest rates, valuations and modelling would get a lot more sophisticated.

CONCLUSION

Lending is such a fundamental part of traditional finance that we take its existence for granted. Crypto markets are so young, however, that lending is still an emerging concept. While some platforms have been around for a couple of years, 2019 saw a flurry of product launches and an awakening of interest from investors and traders, which contributed to a solid growth in deposits and originated loans.

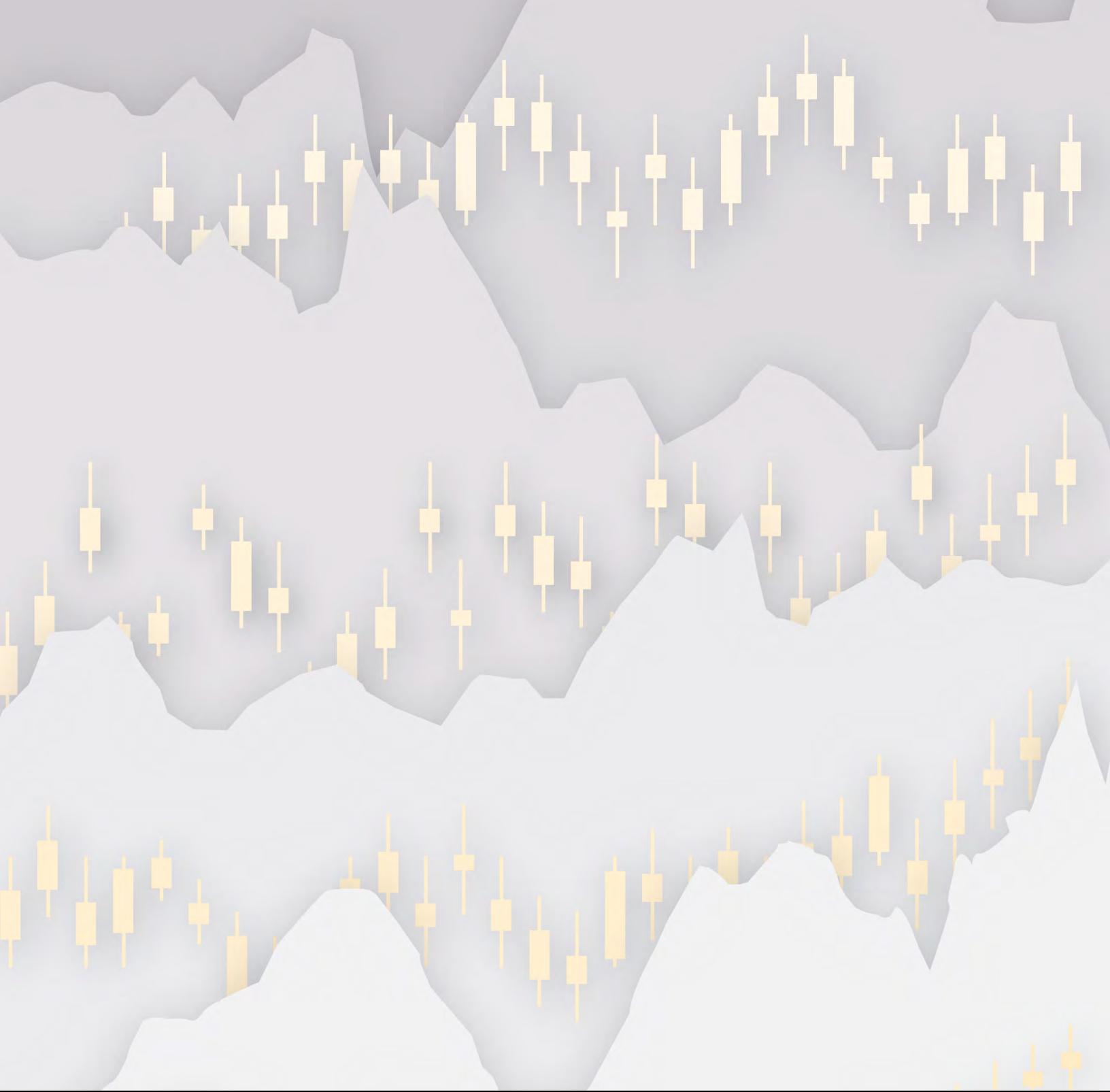
With this report, we hope you have a clearer idea of why crypto lending is such a compelling feature of the digital asset landscape. It's not just the differences between traditional and crypto-backed lending, although those are likely to attract increasing interest from investors of all types. It's also the potential impact the activity will have on the entire sector going forward—the enhanced liquidity, the increased flexibility and the innovative business models.

The past few months have seen a rapid evolution of volumes and available services, a trend that is likely to continue well into next year. This is in spite of lackluster crypto markets—should prices start to pick up, this activity is likely to intensify.

To keep up with sector developments, [subscribe to our weekly *Institutional Crypto* newsletter](#), and visit coindesk.com for up-to-date information.

We welcome your feedback and comments at research@coindesk.com.

We would like to thank CoinDesk Research would like to thank Alexander Fisher of Michigan Ethereum Meetup, Mark Murphy of DCG, Tim Ogilvie of Staked, Mariano Conti of MakerDAO, Coin Metrics, Alethio, Dune Analytics, Celsian, DeFi Pulse and Loanscan.io for their help with providing data for this report. for their help with data for this report.



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