DELPHI DIGITAL

Decentralized Finance (DeFi)
Thematic Insights

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Executive Summary

Decentralized Finance (DeFi), also known as Open Finance, represents a broad category of financial applications being developed on open, decentralized networks. The objective is to build a multi-faceted financial system, native to crypto, that recreates, and improves upon, the legacy financial system. To the right we have highlighted a few important projects, which we will explore further throughout this report, however, the list is not exhaustive for each category.

Potential Benefits:
- Permissionless: Anyone with an internet connection can access; this can boost financial inclusion
- Censorship Resistant: No third-party can stop a transaction
- Immutable: No third-party can reverse a transaction
- Reduced Counterparty Risk: No need to trust a centralized third-party to custody funds or validate transactions
- Transparent: Public blockchains (e.g. Ethereum) are completely transparent and auditable
- Open Source: Anyone can develop on or modify the code
- Programmable: Smart contracts can be coded for a specific task and self execute
- Efficiency: Powered by code, not humans
- Composable: Combine different protocols to create new financial products and services

Near-term Concerns:
- Non-existent links to physical/traditional assets
- Regulatory risks and bad UI
- Limited product/market fits
- Potential for high spreads & low liquidity
- Limited on-chain throughput

Decentralized Exchanges ("DEXs") & Protocols:

IDEX

0x

Kyber Network

Uniswap

Ren

Bancor Network

Lending & Borrowing:

MakerDAO

Compound

Dharma

Derivatives, Margin Trading, & Prediction Markets:

Augur

CDx

$\delta Y / \delta X$

dYdX

bZx

Daxia

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Decentralized Exchanges & Protocols

0x

- **0x** is an open protocol that enables the peer-to-peer exchange of assets on the Ethereum blockchain.
- **ZRX** is its token and is used for governance and paying fees.
- The protocol is live, with many DEXs and projects in the space implementing its tools.

Uniswap

- **Uniswap** is a protocol for automated token exchange on Ethereum.
- It **does not have its own token**.
- It received a $100k grant from the Ethereum Foundation.
- The protocol is live (launched Nov 2018)
- Permissionless listing, gas efficient, good UX, ~25k ETH & $7.1m pooled liquidity.

Kyber Network

- **Kyber Network** is an on-chain liquidity protocol enabling swaps on Ethereum.
- **KNC** is its token; third-party token reserves need to buy KNC to pay fees; a portion of these fees are burned
- The protocol is live
- ~$300k in pooled liquidity, Uniswap was recently added as a liquidity reserve

Bancor

- **Bancor Network** is a cross-chain conversion protocol allowing tokens to be swapped on Ethereum and EOS.
- **BNT** is its token and is used in determining the conversion rate for token swaps.
- The protocol is live
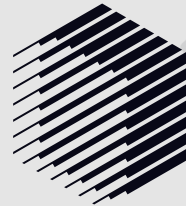
Ren

- **Ren** is a privacy-focused protocol that enables third-parties to create custom dark pool DEXs. It also has a swapper tool.
- **REN** is its token and can be staked to run the network. Stakers earn a yield from transaction fees (not paid in REN).
- RenEx, a dark pool operated by the developers, is currently in beta.

IDEX

- **IDEX** is operates similar to a centralized exchange, however, trades settle on-chain. It is a component of AuroraDAO.
- **AURA** is its token and can be staked to secure parts of its architecture. Stakers earn a yield from transaction fees (in ETH).
- It is live and accounts for approximately half of total DEX volume.

Data as of March 19th, 2019

DEX Characteristics

While each of the DEXs we've covered is unique in its own way, understanding the differences between them may not always be clear. Below, we have broken out four key characteristics, which we will use to categorize these DEXs on the following slide.
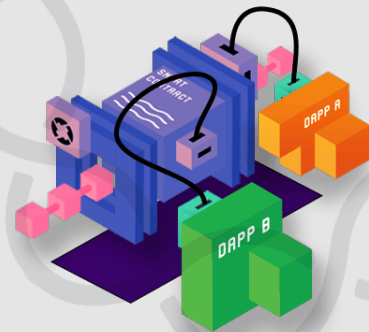
Type

- **Swap**: Trades are conducted directly against smart contract token reserves; prices are determined using a conversion formula
- **Exchange**: Similar to a traditional, centralized exchange
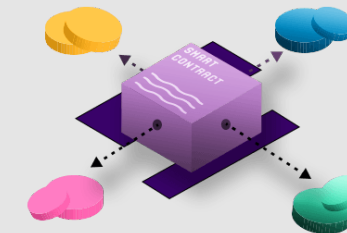
Settlement

- **On-Chain**: Trades are finalized and ownership transferred directly on the blockchain
- **Off-Chain**: Trades are finalized and ownership transferred in a third-party system
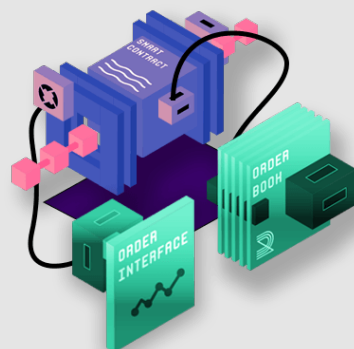
Order Books

- **On-Chain**: Order books held in a smart contract directly on the blockchain
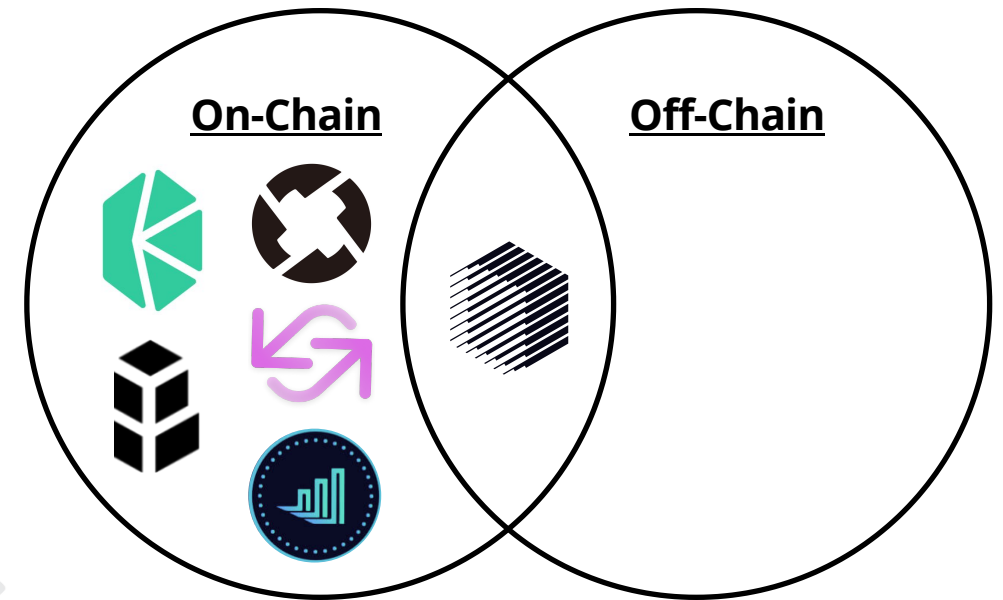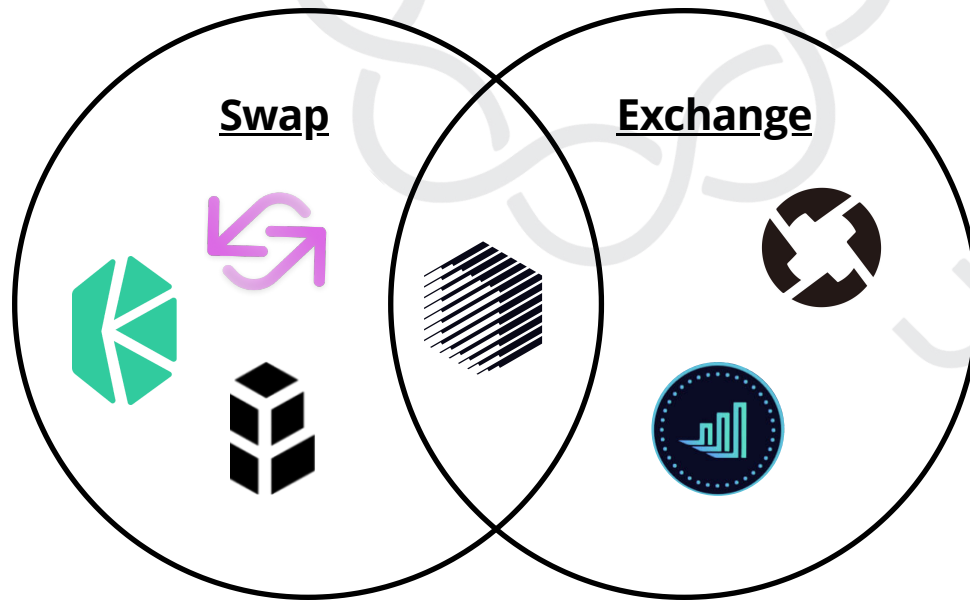- **Off-Chain**: 3rd party operated order books (e.g. Relayers in 0x)
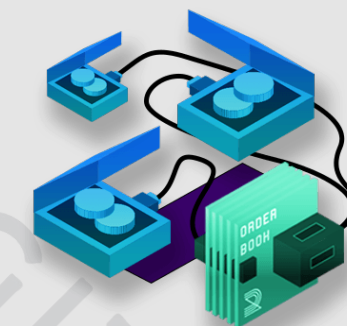
Pooled Liquidity

- **On-Chain**: Liquidity is pooled in smart contracts directly on the blockchain
- **Off-Chain**: Multiple third-parties aggregate order books to pool liquidity
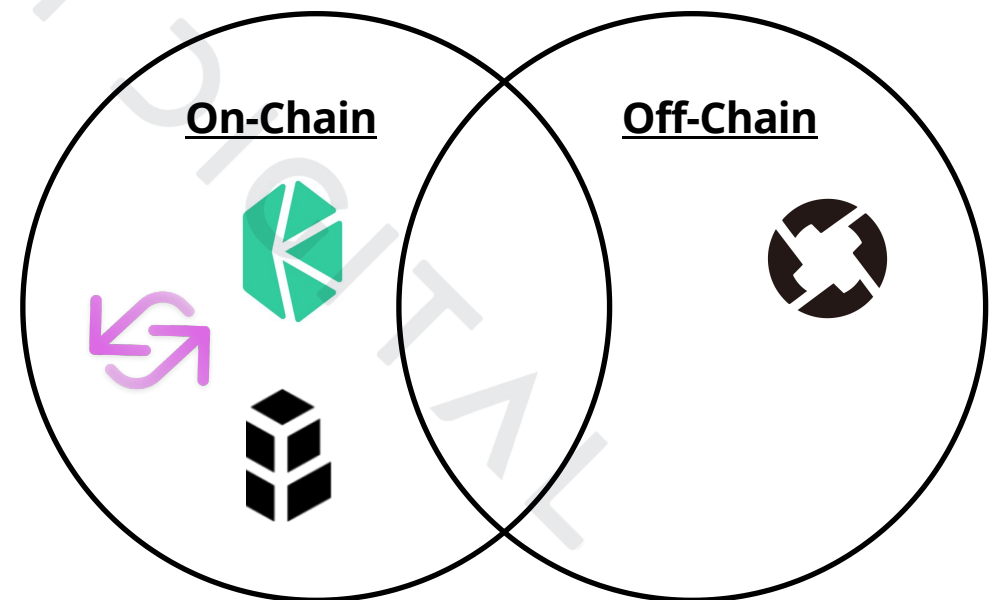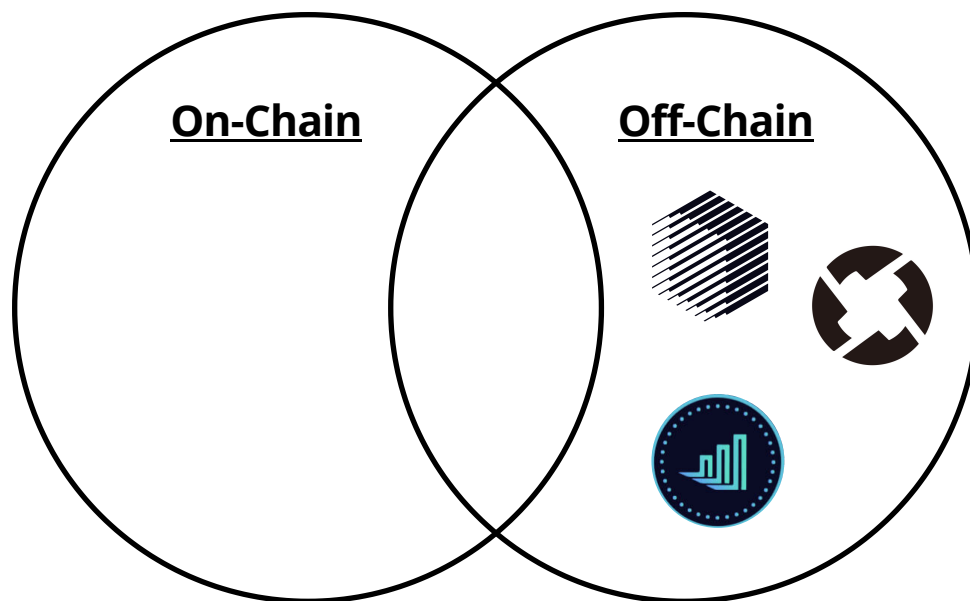
DEX Categorization

*Bancor, Kyber, & Uniswap don't have order books; Ren's hidden order books are secured by its protocol
**Ren & IDEX do not fit the definitions on the previous slide

Sources: 0x Github, Radar Relay, Ren Litepaper, Evan Botello Github,
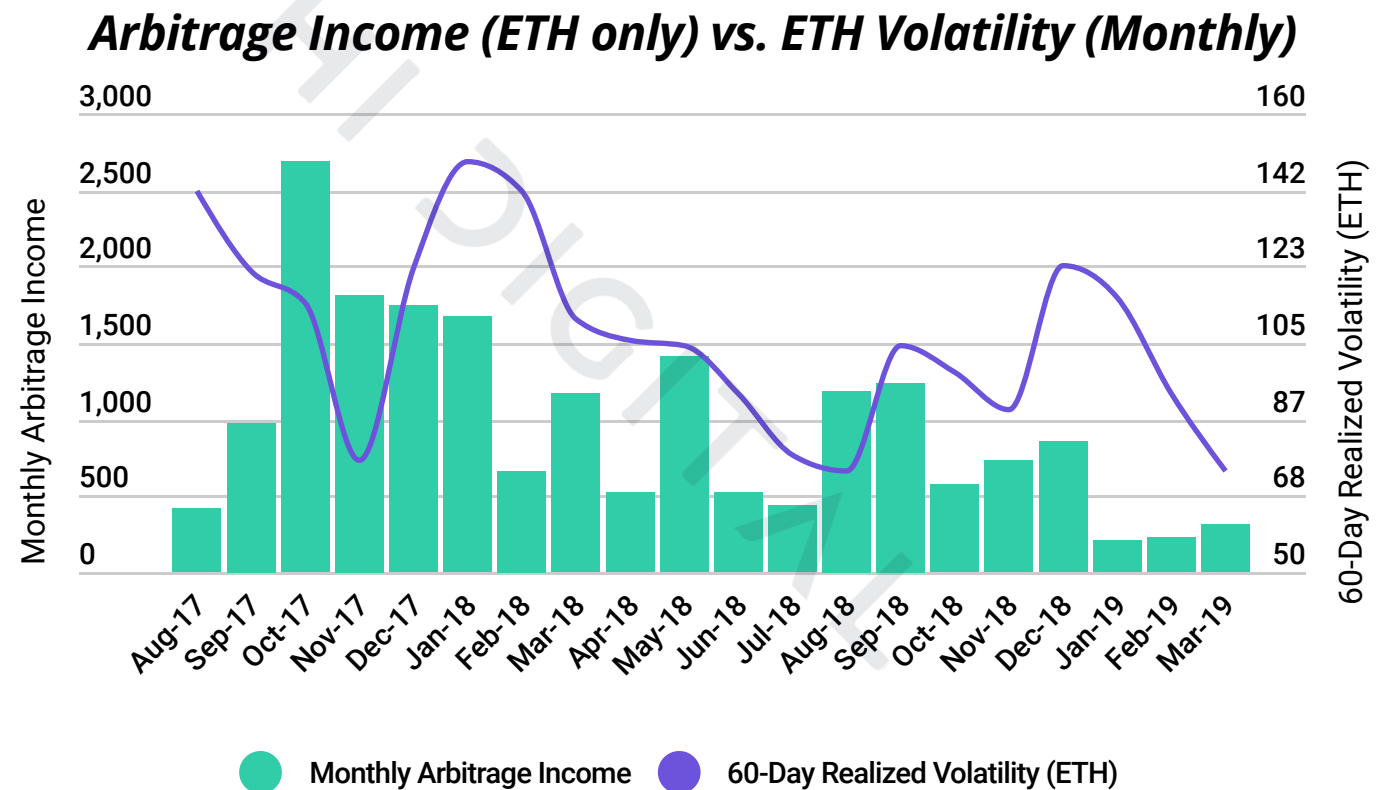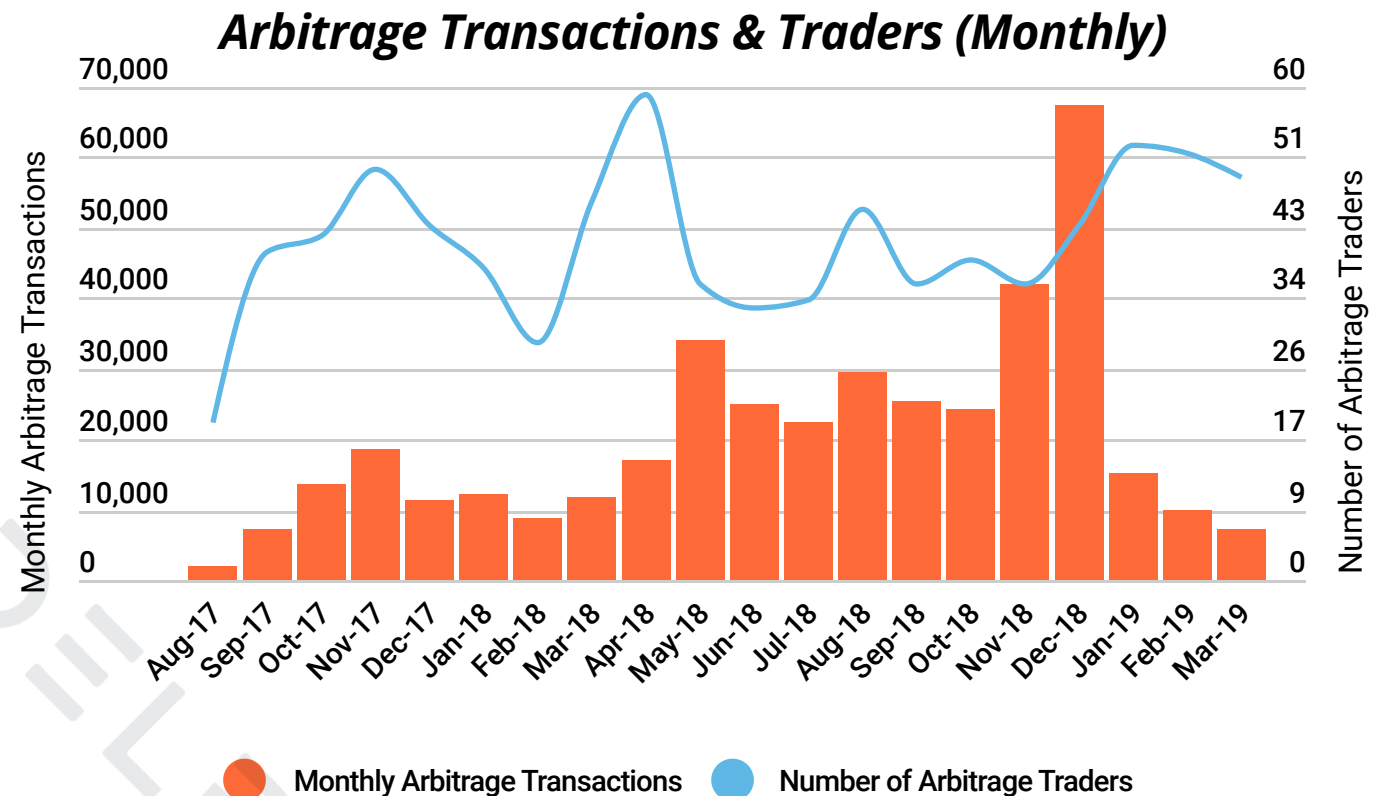
DEX Arbitrage Opportunities

Markets, particularly nascent ones such as this, can be imperfect and have price discrepancies for the same asset across multiple exchanges. While these may be small and short lived, skilled traders can take advantage of them to lock in a risk-free profit through arbitrage.

Ethereum's transparency makes it possible to isolate these traders. In the charts to the right, we used Bloxy's on-chain analytics tools to explore this topic further. This data is based on distinct DEX traders who earn positive income in every currency they trade.
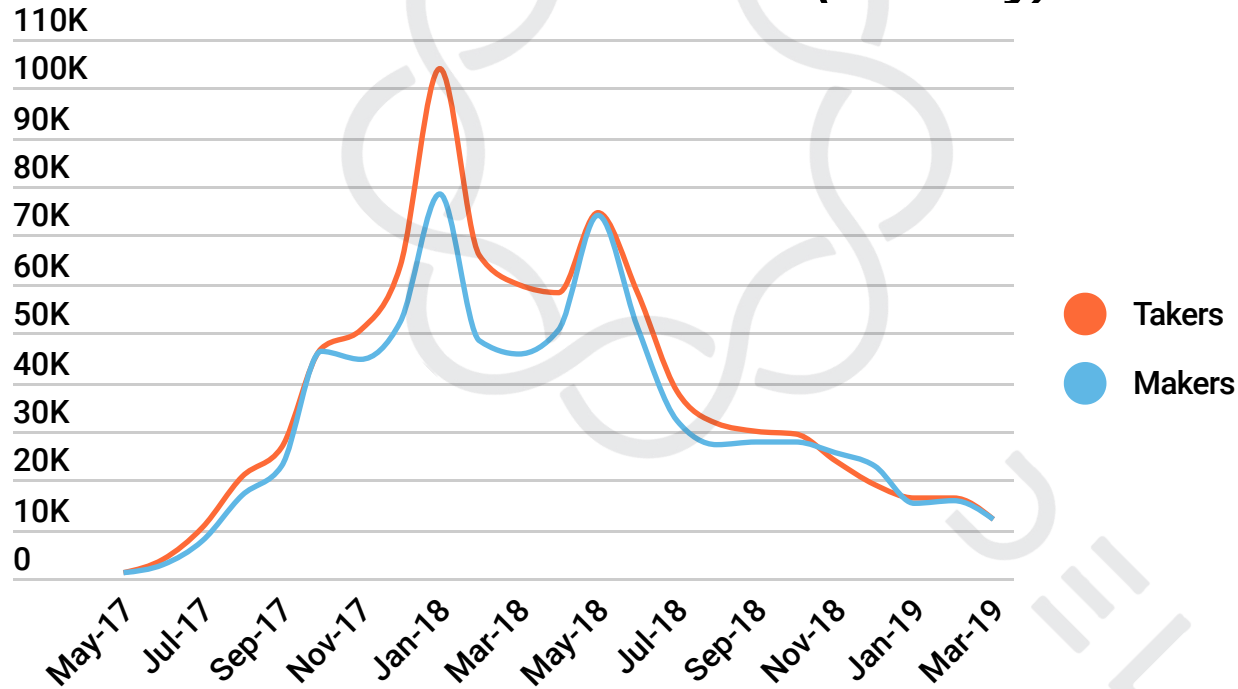
The number of arbitrage traders has remained consistent and relatively low, with the median monthly count at 41. These traders have seen their income trend lower over the last 12-18 months, which could be attributed to greater market efficiency, and a general decline in volatility (albeit realized vol is still elevated compared to traditional assets).

The emergence of products like Totle, which aims to aggregate DEX liquidity, are likely to place additional pressure on spreads between DEX's as price discovery becomes more efficient.
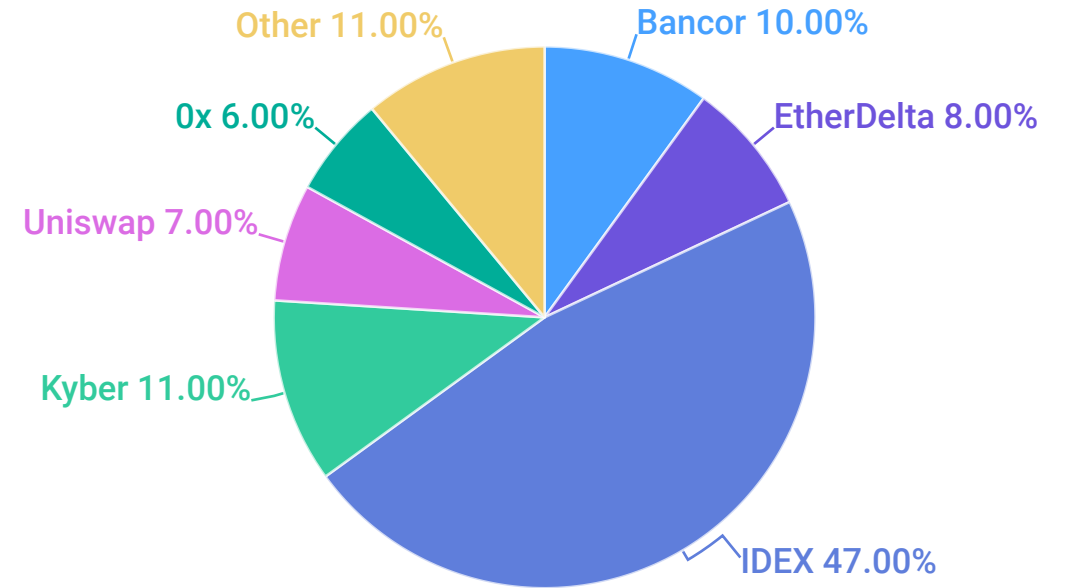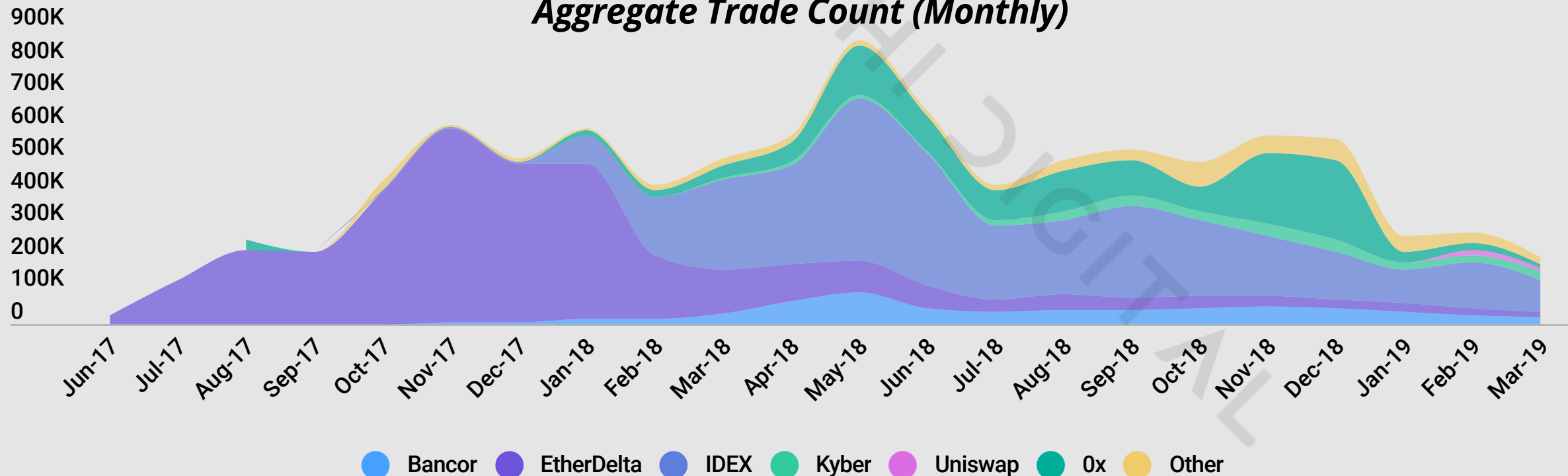
Data as of March 18th, 2019
Sources: Bloxy

Arbitrage Transactions & Traders (Monthly)

Monthly Arbitrage Transactions   Number of Arbitrage Traders

Arbitrage Income (ETH only) vs. ETH Volatility (Monthly)

Monthly Arbitrage Income   60-Day Realized Volatility (ETH)

DEX Data

Distinct Takers & Makers (Monthly)

Legend:
- Takers
- Makers

X-axis: May-17, Jul-17, Sep-17, Nov-17, Jan-18, Mar-18, May-18, Jul-18, Sep-18, Nov-18, Jan-19, Mar-19

Y-axis: 0, 10K, 20K, 30K, 40K, 50K, 60K, 70K, 80K, 90K, 100K, 110K

% of Trade Count (Last 30 Days)

- Other 11.00%
- Bancor 10.00%
- EtherDelta 8.00%
- 0x 6.00%
- Uniswap 7.00%
- Kyber 11.00%
- IDEX 47.00%

Aggregate Trade Count (Monthly)

X-axis: Jun-17, Jul-17, Aug-17, Sep-17, Oct-17, Nov-17, Dec-17, Jan-18, Feb-18, Mar-18, Apr-18, May-18, Jun-18, Jul-18, Aug-18, Sep-18, Oct-18, Nov-18, Dec-18, Jan-19, Feb-19, Mar-19

Y-axis: 0, 100K, 200K, 300K, 400K, 500K, 600K, 700K, 800K, 900K

Legend:
- Bancor
- EtherDelta
- IDEX
- Kyber
- Uniswap
- 0x
- Other

Data as of March 18th, 2019
Sources: Bloxy

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Lending & Borrowing

MakerDAO

- **MakerDAO** is a borrowing platform built on Ethereum. It allows users to open a collateralized debt position (CDP) by posting ETH as collateral to borrow against.
- **MKR** and **DAI** are its two tokens.
- Lent funds are paid in DAI, which is a stablecoin pegged to the dollar.
- There is a stability fee, paid in MKR, users need to pay on their CDP to close it (the current rate is 3.5%). The MKR used to pay is subsequently burned. However, more MKR can be issued under a forced recapitalization.
- MKR is also used for governance.
- The value of the locked up collateral must be greater than 150% of the DAI borrowed. This equates to a max LTV of ~67%. If this threshold is breached, the collateral is liquidated to cover the value of the lent DAI.

Compound

- **Compound** is a protocol for algorithmic, efficient Money Markets on Ethereum.
- It **does not have its own token**.
- Users can supply assets to the protocol and earn interest, or borrow from protocol and pay interest. A user can borrow any asset, as long as they maintain a Supply Balance that's 1.5x their Borrow Balance as collateral.
- Each market has dynamic interest rates, which float in real-time as market conditions adjust.
- Interest accrues each Ethereum block (every ~15 seconds), which means a users balance will increase by (1/2102400) of the quoted interest rate.
- Every user that supplies an asset to the protocol earns the same interest rate, each block, regardless of when they originally supplied the asset.
- Compound keeps a small residual of all interest that moves through their system.

Dharma

- **Dharma** is a platform for building lending products on Ethereum.
- Dharma Lever is one these products and provides instant margin loans for traders.
- It **does not have its own token**.
- It facilitates peer-to-peer crypto lending by allowing two parties of a loan to be discoverable.
- Offers users the ability to borrow and lend crypto assets directly from their personal wallets (hardware, hosted, or otherwise).
- Borrowers can customize their desired loan terms, including asset type, collateral, and duration. Once they trustlessly lock up collateral in smart contract, they receive principal instantly.
- Lenders set a risk profile by specifying their desired loan terms.
- Dharma Lever supports ETH-based assets & will soon add support for BTC.

Data as of March 19th, 2019

MakerDAO Growth

MakerDAO accounts for almost 90% of total USD value locked in decentralized finance projects and has seen impressive growth over the past few months. MakerDAO recently put out a report, which showed there were nearly 8,200 unique addresses with a non-negligible Dai balance. In addition, they observed 20% monthly growth for holders and active addresses. Below, we charted the amount of ETH staked in MKR and the price of ETH since the start of 2018. It's important to highlight that, as a lending platform, Maker remained resilient even as the price of the asset it lends against (ETH) lost much of its value over the course of 2018.
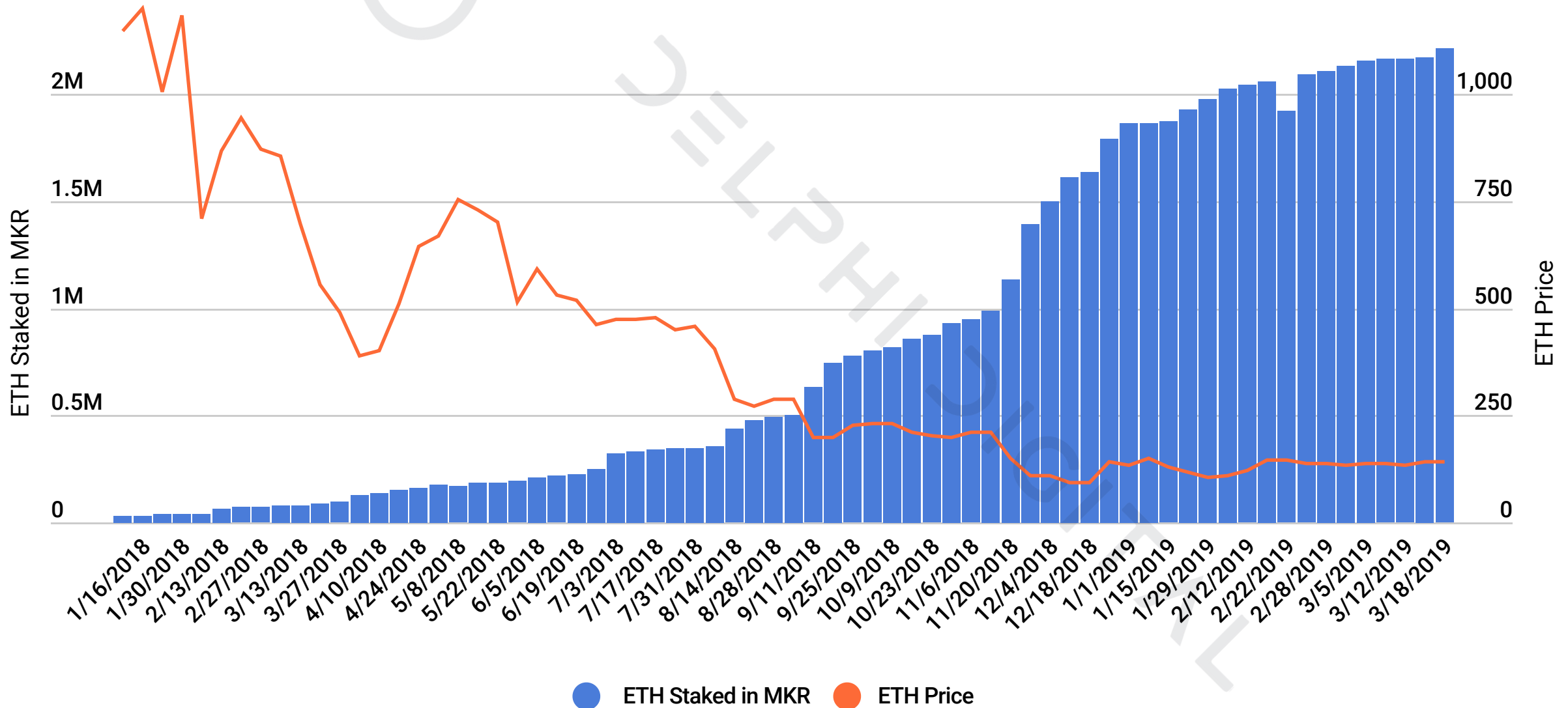
Data as of March 18th, 2019
Sources: DAI In Numbers, DeFi Pulse, Mike McDonald's Github

Compound Finance Growth

Since **Compound** launched their money market protocol at the end of September 2018, they've seen some meaningful growth across users borrowing REP, DAI, and Wrapped Ether (WETH). They currently have over $24 million worth of assets held as collateral and recently announced the next generation of their protocol. This next version will include granular risk modeling, more asset gateways, and planned governance improvements.

Amount Available To Borrow in USD (Weekly)

Legend: WETH, DAI, REP, BAT, ZRX
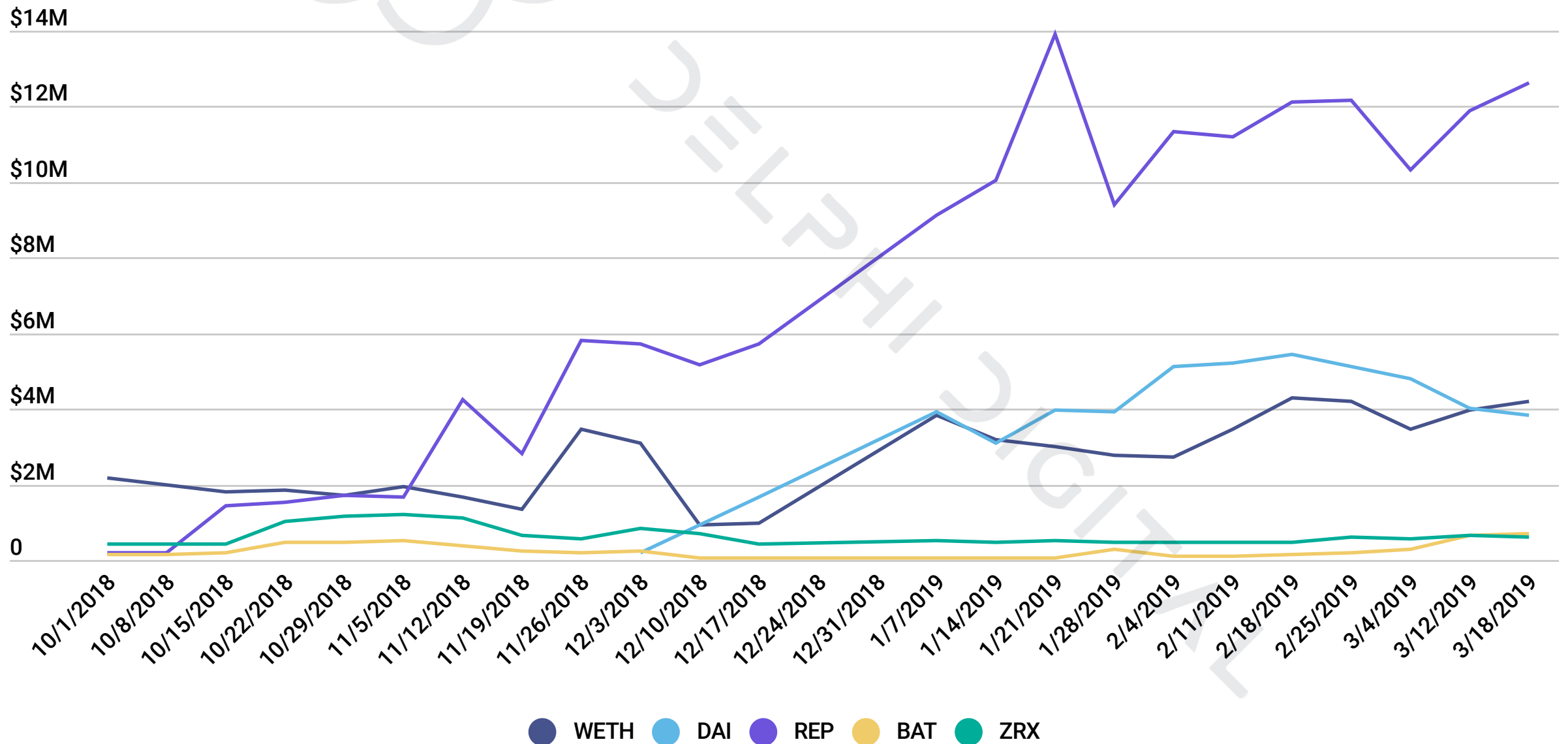
Data as of March 18th, 2019
Sources: Compound Finance, DeFi Pulse

Dharma Lever Growth

While **Dharma** isn't fully live to the public yet, in January they released their Alpha. This made it possible for users granted early access to borrow and lend ETH on their platform. In March, this was expanded to DAI as well. As you'll see on the following slide, Dharma is currently subsidizing the market to gain traction, with a cost to borrow that's lower than a cost to lend. Using ETH as an example, this means that early access users can currently lend to Dharma and earn 4%, and get charged to borrow from Dharma at 0.10%.

Borrowing & Lending Volume in USD (Trailing 7-Day)

● DAI (Lending)   ● DAI (Borrowing)

● ETH (Lending)   ● ETH (Borrowing)
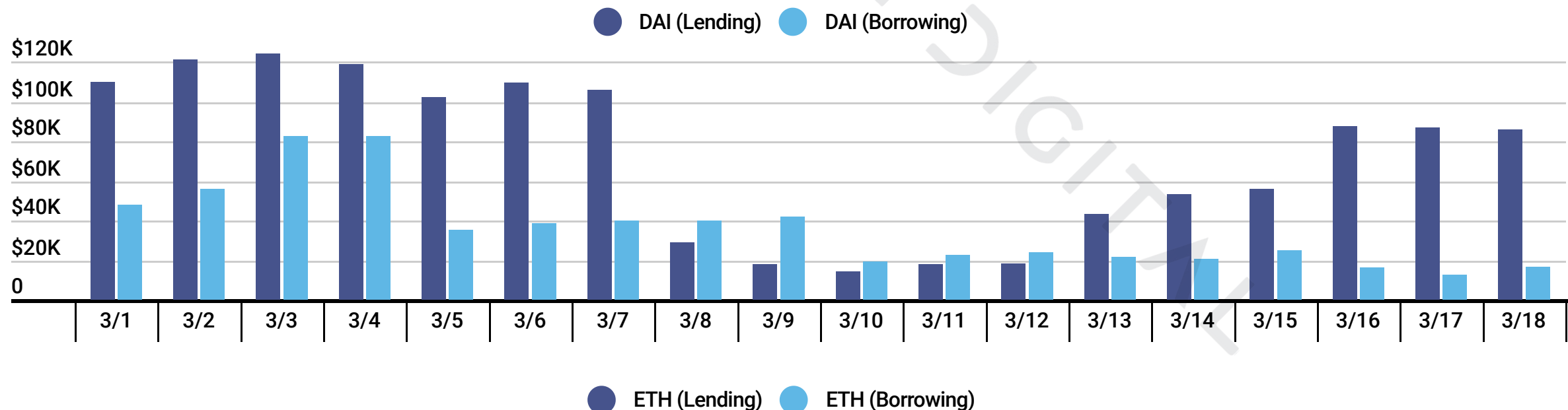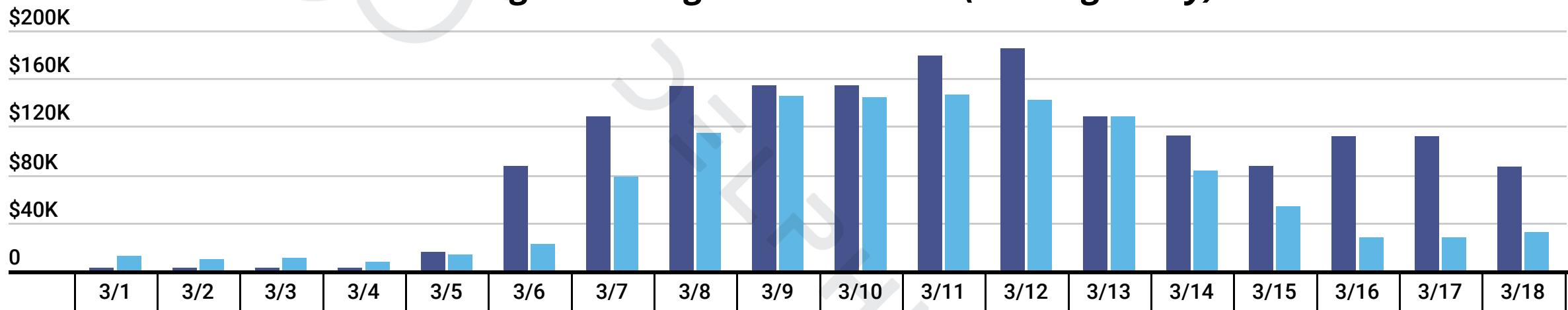
Data as of March 18th, 2019
Sources: Dharma Lever

Lending & Borrowing Rates

To help put each of these platforms into perspective, we've laid out the borrowing and lending rates for each below. It's important to note that these are as of March 18th, 2019 and are subject to change. Please utilize the sources we've attached at the bottom of the page for updated rates moving forward.

	Borrowing Rates		Lending Rates	
DAI	3.50%		—	

	Borrowing Rates				Lending Rates			
BAT	6.56%	WETH	7.86%		BAT	0.20%	WETH	0.45%
DAI	10.32%	ZRX	8.77%		DAI	3.43%	ZRX	0.66%
REP	5.07%				REP	0.01%		

*	Borrowing Rates		Lending Rates	
ETH	0.10%		ETH	4.00%
DAI	0.10%		DAI	3.50%
USDC	0.10%		USDC	3.50%
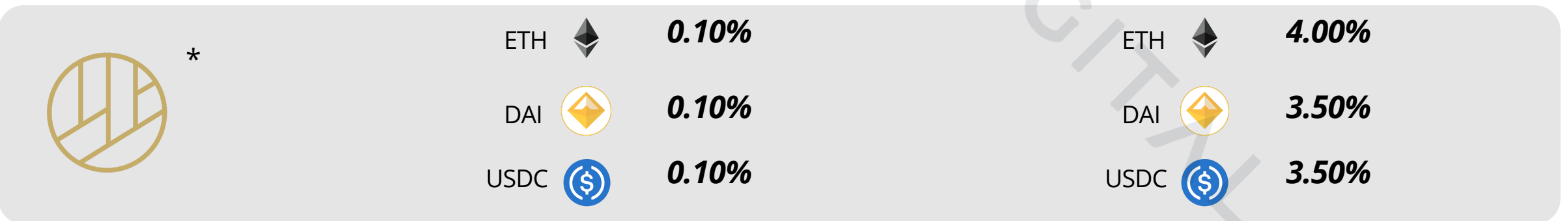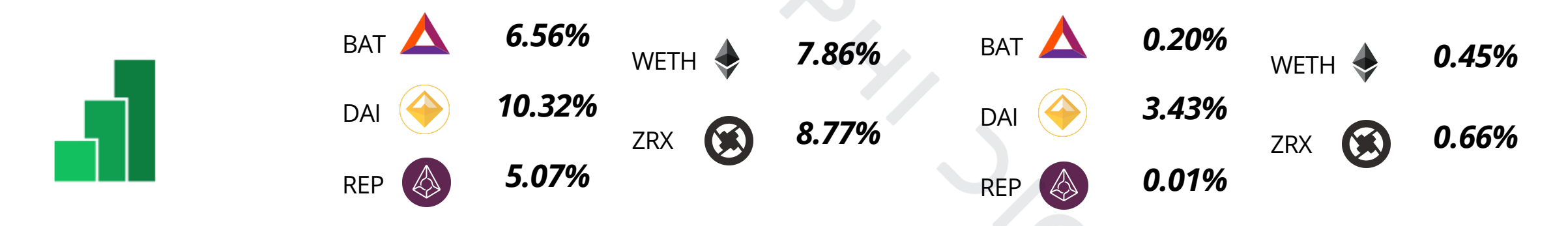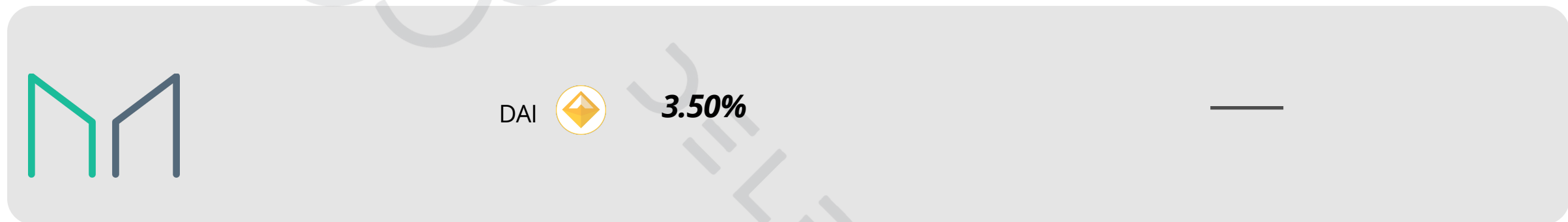
* Dharma Lever is not live yet and is currently subsidizing the market

Derivatives, Margin Trading & Prediction Markets

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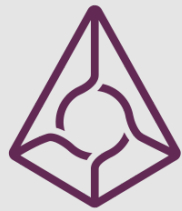
Augur

- **Augur** is a decentralized prediction market on Ethereum.
- It allows users to bet on, or create a market for, the outcome of any event ranging from political elections to sports. Users can go long or short by buying or selling shares in the outcome of an event.
- **REP** is its token, which users stake as collateral to report event outcomes.
- Trading fees (paid in ETH) go directly to market creators and REP stakers.
- If they report the incorrect outcome they do not collect fees and lose their staked REP tokens.
- Payouts are automated and transparent as soon as an outcome is declared.

CDx

- **CDx** is a platform for tokenized insurance (credit default swaps) on Ethereum.
- It is currently not live.
- Tokenized CDS can be used as insurance against the default risk of a counter-party, while also having liquidity.
- For example, users can pay a premium to a seller in return for protection from exchange hacks.
- CDx has two tokens; the **Native Token** can be staked and used for transaction fees. The **Cred Token** is a non-transferable staking token that is given to participants who provide liquidity to the network. It is also used for governance, and can be converted to to Native Tokens at a discount.

dYdX

- **dYdX** is a protocol for margin trading and derivatives on Ethereum.
- It **does not have own token**.
- Traders can take a short or long position simply by buying a Margin Token (ERC-20) without having to borrow or sell the underlying asset.
- Margin Tokens are available for 28 days, with each underlying asset having a token that expires bi-weekly.
- Price is defined by parameters such as the interest rate, amount of collateral, and price of the underlying cryptoasset.
- Trading is live on Expo, which was built using dYdX protocol. Currently supports Short Ethereum (sETH) and Leveraged Ethereum (LETH), both utilizing DAI as the quote currency.

bZx

- **bZx** is a decentralized margin lending protocol built on Ethereum.
- **BZRX** is its token and is used to incentivize order book aggregation by relayers, and governance.
- bZx enables both lending and borrowing for margin trading.
- The protocol integrates with existing Ethereum wallets, allowing users to interact with the protocol easily
- The system allows users to enter into long positions (swap one asset for another), short positions (requires escrow, leverage and margin calls) and leveraged positions, which use the same mechanics as short positions, but allow users to borrow multiples of what they currently own.
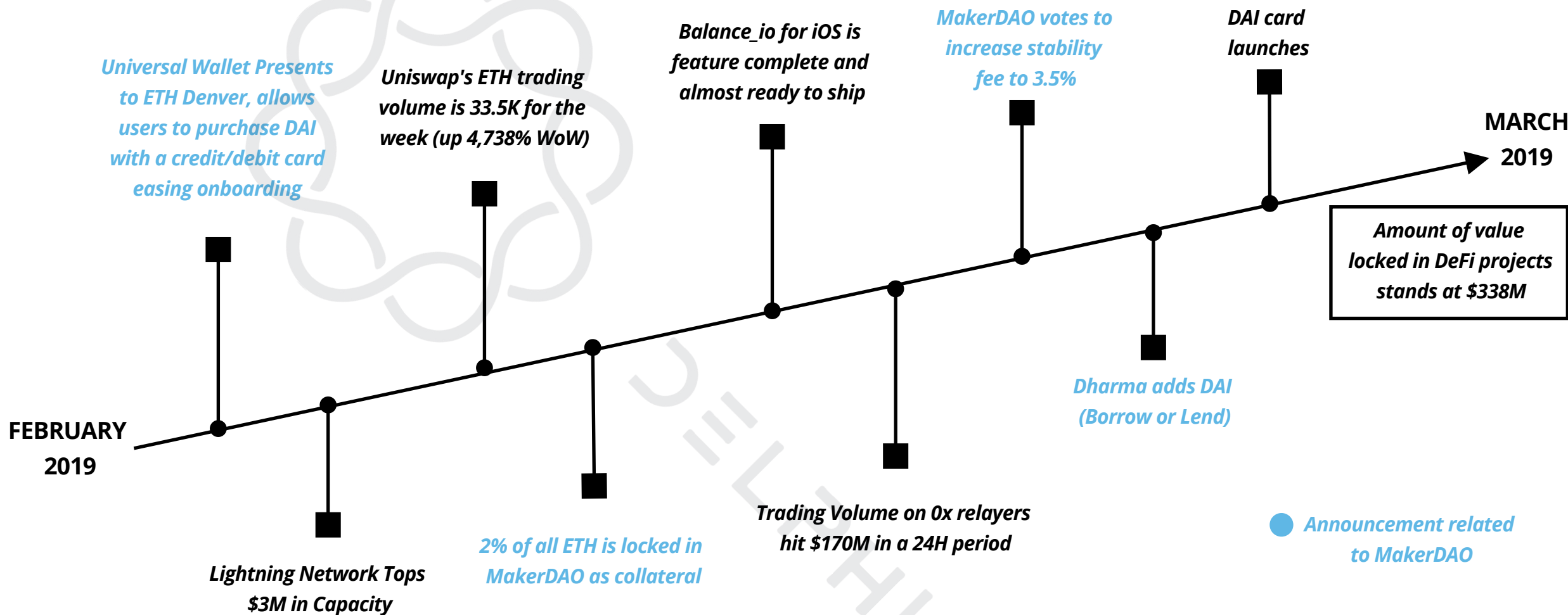
Daxia

- **Daxia** is a platform on Ethereum that makes it possible to issue tokens that represent the long and short side of an asset.
- It **does not have its own token**.
- A creator locks ETH in a smart contract and sets a rate, duration and start date.
- Short and long tokens are issued to the creator and represent the payouts of the contract. These tokens can be exchanged or posted for sale.
- The tokens are ER-C20 tokens.
- Users can also visit the Daxia Bulletin, log in using Metamask, and purchase existing tokens that are for sale.

DeFi Composability

While still early, the market is beginning to see projects integrate multiple DeFi protocols to offer new and unique products for users. Below, we have provided a few examples.

Product	Components	Description
Veil		• **Veil** is a peer-to-peer prediction market built on top of Augur and 0x. • While Augur can take days to finalize an event outcome after the market has expired, Veil allows users Instant Settlement for a 1% fee. Veil essentially takes on the risk that an event outcome could change at finalization in exchange for the fee. Veil also charges a 1% fee per trade. • It utilizes 0x for faster trading by moving order creation and cancellation off-chain.
BambooRelay		• **BambooRelay** is an ERC-20 relayer built using 0x. It implements the off-chain order book • It is the first 0x-standard relay to offer non-custodial, peer-to-peer margin lending by integrating bZx Protocol. • It is currently in beta with minimal volume.
Marble		• **Marble** aims to be an open-source bank that provides funding to provably fair, low-risk protocols requiring a lender. • The first offering is Flash Lending, which allows users to borrow ETH and ERC-20 tokens to take advantage of DEX arbitrage opportunities on exchanges such as Bancor, Kyber, 0x, and EtherDelta. • Flash Lending allows a trader to borrow from Marble, buy a token on one DEX, sell the token on another DEX at a higher price, repay the bank, and earn a profit in a single atomic transaction. • Flash Lending is in beta and has a contract deployed to the Ethereum Mainnet, however, usage has been minimal.

Recent Events

Universal Wallet Presents to ETH Denver, allows users to purchase DAI with a credit/debit card easing onboarding

Uniswap's ETH trading volume is 33.5K for the week (up 4,738% WoW)

Balance_io for iOS is feature complete and almost ready to ship

MakerDAO votes to increase stability fee to 3.5%

DAI card launches

MARCH 2019

FEBRUARY 2019

Amount of value locked in DeFi projects stands at $338M

Dharma adds DAI (Borrow or Lend)

Lightning Network Tops $3M in Capacity

2% of all ETH is locked in MakerDAO as collateral

Trading Volume on 0x relayers hit $170M in a 24H period

● *Announcement related to MakerDAO*

We constructed this report to focus on the unique opportunities decentralized finance projects in this space are currently tackling. While it is clearly not an exhaustive list of every development, we wanted to share some notable events driving the recent acceleration in DeFi activity. This timeline only shows the last thirty days; a testament to how rapidly this sector is evolving. This is not a trend our team believes will moderate any time soon and we look forward to increasing our coverage of promising projects operating within this sector.

Examples of other recent events in this sector include: Dharma Lever's waitlist hit over 2,000 people, Bloom (decentralized credit and identity) topped 250K BloomIDs, and Bloqboard partnering with Sendwyre to allow secondary trading of MakerDAO CDPs OTC.

DeFi Leader Commentary

To get some further insight, we reached out to people building within the community.

Question: What is the largest roadblock preventing widespread DeFi adoption, and when will we overcome this hurdle?

"The main roadblock preventing DeFi proliferation is the lack of access to real world assets as collateral in DeFi applications, which would allow them to scale beyond their current boundaries. I think the first few solutions for regulated assets compatible with DeFi will come out in 2019, but only really gain momentum in 2020 and beyond."

- Rune Christensen, CEO of MakerDAO

"One of the biggest roadblocks today is the lack of insurance and the inability to underwrite smart contract risk. Institutions aren't comfortable escrowing money if there's no indemnification from tech failures"

- Max Bronstein, Marketing Manager of Dharma

"Private keys are the largest obstacle to DeFi adoption. The tools to make interacting with DeFi are simply too difficult, complicated, and cumbersome for most normal users."

- Robert Leshner, CEO of Compound Finance

"Biggest roadblock is that the centralized alternatives are often as good as the decentralized ones."

- Tim Ogilvie, Staked CEO

"A Venmo Moment"

- Richard Burton CEO of Balance

Disclosures

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