

PARALLAX DIGITAL

AUGUR [REP] VALUATION REPORT

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Augur [REP] Valuation Report – April 2, 2018

Application: Augur **REP Market Cap:** \$298M
Cryptoasset: REP **REP Current Price:** \$27.12

Purpose: [Augur](#) is a ‘Decentralized [Predictions Market](#)’ application where users trade on the outcomes of any future event for a 1% fee. Augur is enabled by the cryptoasset [REP](#). Its purpose is to democratize and decentralize finance. Here is Augur’s 2-minute [intro video](#).

Potential: A large, accessible and [censorship resistant](#) predictions market will improve event forecasting and information quality on a global scale. In such a market, all individuals with access to good information are economically incentivized to trade on it. Markets absorb this [asymmetric information](#) provided by traders in the form of price and volume and symmetry is restored. Prediction markets tap into the ‘[wisdom of the crowd](#)’ and create a world with more accurate, relevant and robust information. The total potential market capitalization for predictions is over \$1,200T and is made up of sports gambling, online gambling and financial derivatives:

- The global market for sports gambling is valued at up to [\\$3T](#)
- Online gambling is a high-growth, global market approaching [\\$1T](#)
- Financial derivatives markets are valued as high as [\\$1,200T](#)

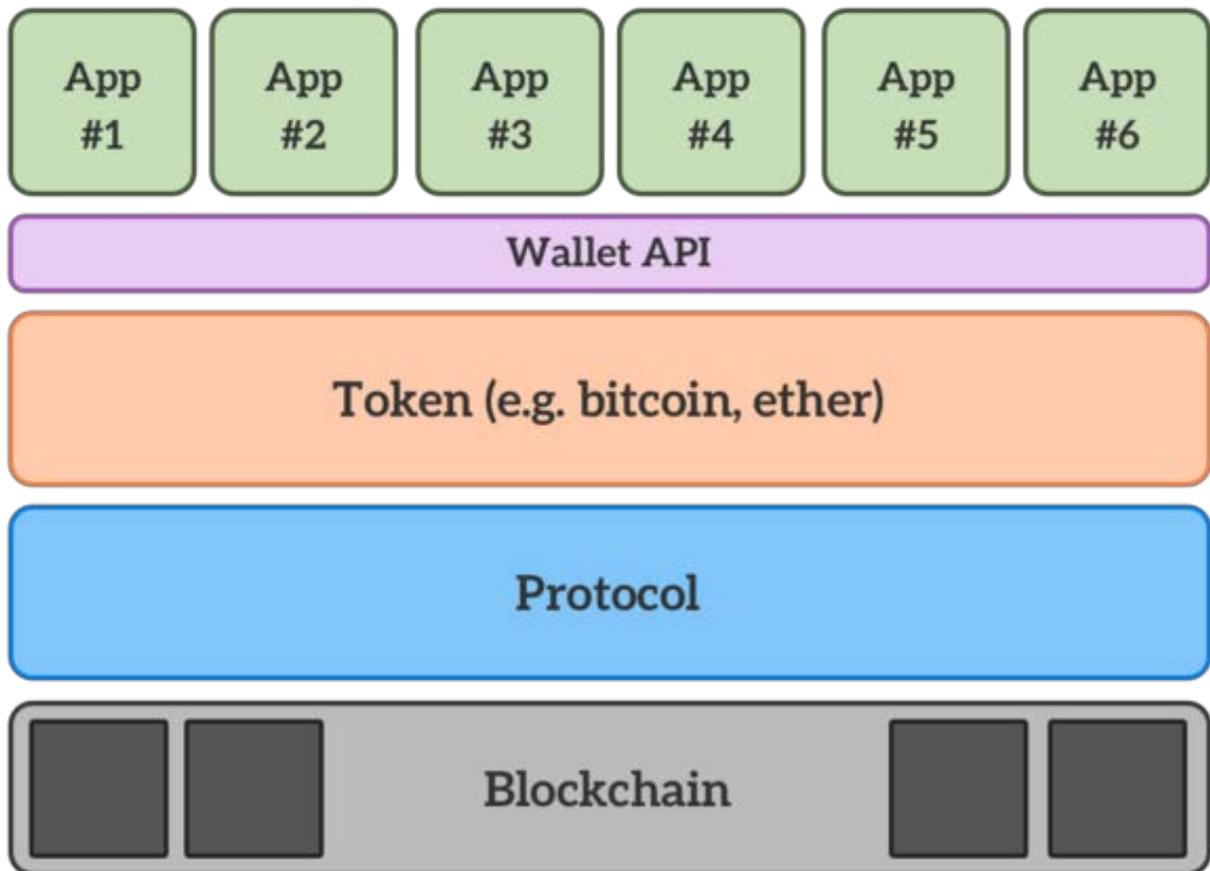
People: Augur was founded by [Joey Krug](#), who also led the software development team for the Augur project. Recently, it was announced that Joey would be joining Pantera Capital as a partner in their cryptoasset fund. Pantera has committed a significant portion of this fund’s capital pool to provide initial liquidity to the Augur network. This will give Augur significant advantages in its efforts to scale by helping to create network effects, deepen liquidity pools, optimize market efficiencies and stress test the technology early on.

Augment Partners (AP) has also committed to deploying commercial applications which leverage Augur. Ron Bernstein, the former CEO of centralized predictions markets [InTrade](#) and TradeSports, leads AP and serves on Augur’s advisory board.



Overview: Augur is a [decentralized application](#) that functions as a predictions market. The native cryptoasset that serves the Augur decentralized application is called REP.

Token Type: Augur is built on the [Ethereum](#) blockchain and REP is built to its ERC20 token standard. This makes REP an ‘application token’. As an [ERC20 token](#), Augur is reliant on the functionality, scalability and throughput at the Ethereum blockchain and protocol layers. One can approximately analogize this relationship by thinking of Ethereum as the ‘iOS marketplace for decentralized applications’ – where Ethereum is the operating system (like iOS) on top of which decentralized applications are built (like the apps in the app store):





Function:

In a predictions market, participants create and execute bets on future events. Accurate predictions are rewarded and inaccurate predictions are punished. In Augur, these rewards and punishment come in an economic form as real money is wagered. Each outcome is probabilistically traded from 0 to 100%, which are determinable by the market price of each share.

A simple example is a political election. Say the shares for each candidate are trading as follows:

- Major party candidate shares trading at \$0.70
- Medium party candidate shares trading at \$0.28
- Minor party candidate shares trading at \$0.02

These prices are indicative of the market's forecasting the following probabilities for each candidate's victory:

- Major party candidate likelihood of victory 70%
- Medium party candidate likelihood of victory 28%
- Minor party candidate likelihood of victory 2%

Although there can be several possible outcomes for each prediction, the actual outcomes for each market participant making a wager is binary – either win or lose. Participants either lose their entire staked bet or win the difference between their staked bet and \$1.00.

In our example, once the election results are final, shares for the winning candidate will be valued at \$1.00 and all other shares will be worthless. It's this pricing dynamic that encourages participants to trade on privileged information, since buying lower priced shares in outcomes with higher probability of success directly benefits market participants. The reverse is also true, where candidates are encouraged to sell shares in outcomes that are priced higher than their probability of success. Through the forces of supply, demand and volume of knowledge, prediction markets absorb asymmetric information from its participants and restore [information symmetry](#) to the marketplace in the form of accurate outcome forecasts. This is an economically effective concept on a macro scale. Imagine an airline being able to purchase shares in the outcome of a natural disaster interrupting its operations. Using Augur, such a wager could serve as an effective insurance contract with an administrative cost of only 1%.



How Reputation Tokens Work

by Tony Sakich



1. Event Occurs

An event occurs that is being wagered upon in a market created on the Augur network.



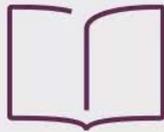
2. Outcome Reported

Outcome results are reported by Reputation (REP) holders to Augur in two steps.



3. Reporting: Pt 1

REP holders privately and securely submit outcome results to the Augur network.



6. Payout

Those who wagered correctly are paid out for their predictions.



5. Consensus

Upon completion of reporting period, consensus is achieved, leading to two financial events.



4. Reporting: Pt 2

About 1 month later, a second report is publicly submitted in plain-text, for all to see.



7. Fee Distribution

Honest and active reporters receive trading fees proportionate with REP holdings.



8. Liars Pay!

Dishonest & negligent reporters lose REP, which is redistributed to honest and active reporters.



9. Just Predicting?

REP is only necessary for those wishing to report, not for those just wishing to wager.





Structure:

Although predictions markets have existed before, they have had limited success and relatively short lives for a number of reasons:

- Regulatory targeting because of an association with gambling.
- Requirement to operate without regulatory clarity.
- Money exchange only possible over centralized channels which are slower, more expensive and subject to regulatory intervention.
- Limited market participation (driven largely by the issues above) which reduced the pool of staked capital and information – thereby creating marketplace inefficiencies and suboptimal predictions.

Since Augur is a decentralized application it is not owned or operated by any single entity or individual. Like the internet, it is [‘everywhere and nowhere’](#) and cannot be unilaterally regulated. Decentralization accomplishes several key requirements for a predictions market to become large, liquid and highly effective:

- Governments cannot effectively regulate a decentralized marketplace as there is no central company to shut down or censor.
- With a digitally native marketplace and infrastructure, Augur is highly accessible to participants all over the world.
- The use of cryptoassets to stake bets also reduces the friction and [counterparty risks](#) associated with centralized payment channels.
- Reporting of outcomes (aka outcome resolution) can be accomplished in a decentralized manner. This prevents any single actor from introducing elements of error, manipulation or fraud into the reporting process.

Outcome resolution is a major challenge in any predictions market. Reporting of outcomes needs to be accurate, timely and cost effective. Additionally, reporting should be protected from the implications human error, manipulation and fraud. Augur accomplishes this by using its native cryptoasset, REP, and a sophisticated resolution system. Augur publishes updates about its mechanisms for outcome resolution [here](#).

Each REP token holder is incentivized to accurately report on the outcome of events as they happen. Accurate reports (those who report consistent with the consensus) are rewarded an allocation of network fees based on the total REP tokens held. Network fees are to be set at 1% of the total betting



volume (aka outstanding interest). Inaccurate reports (those who report contradictory to the consensus) forfeit up to 20% of their REP tokens held. By combining this ‘carrot and stick’ incentive system with the blockchain’s high level of transparency and auditability, Augur has the potential to become an almost entirely [self-regulated predictions market](#). If outcome resolution mistakes occur, Augur has [backup resolution processes](#) in place.

Markets:

Prediction markets, in a general sense, are collectively the most valuable markets in history. Encompassing everything from gambling to exotic financial instruments called derivatives, these markets are collectively valued at over \$1.2 Quadrillion - that’s a staggering \$1.2 Million Billions:

- Sports gambling is valued at [\\$3T](#). Most of this activity is concentrated within jurisdictions where gambling is legal and in the black market. The bookies and services that facilitate this gambling typically take a 10% fee on each bet. Given Augur’s global accessibility, censorship resistance and 1% fees – we conservatively project that it will penetrate the market for sports gambling by 1% within 4 years.
- Online gambling is projected to be [\\$1T](#) by 2021. This is largely being driven by online casino innovation, increasingly lax regulatory stances and burgeoning internet accessibility around the world. Given this demographics’ inherent appreciation for computer and internet usage, we project that Augur will penetrate the market for online gambling by 5% within 4 years.
- [\\$1,200T](#), nearly all of this colossal value, is attributable to the financial derivatives markets. Given the [overlapping, prospective nature](#) of these wagers that lack requirements for [full collateralization](#) – these contracts can have a notional value well in excess of annual world economic output. In this analysis we are conservatively projecting a derivatives market penetration of two thousandths of 1% (0.002%) within 4 years.

Risks:

Since Augur is a decentralized application built on the Ethereum protocol, it’s security, scalability and reliability are inextricably linked to Ethereum. Currently, Ethereum’s major drawback is its transactional throughput. Considering there are already hundreds of decentralized applications running in parallel on Ethereum, each with their own tokens competing for their respective share of this transactional throughput – it’s easy to see how the Ethereum blockchain experiences congestion at peak times. This is a known issue, and Ethereum has been working to resolve this scalability concern over the past 18 months. There are many possible [solutions being developed](#), and Ethereum is [subsidizing research](#) to develop even more.



Another prominent risk related to user adoption of Augur is the price volatility of cryptoassets and the lack of a ‘stablecoin’ which would hold its value relative to a stable fiat currency, like the US Dollar. Initially, Augur’s markets and payouts will be denominated in [ETH](#), the native cryptoasset of Ethereum. Without a stablecoin to use in the wagering system, participants will be forced to also take their chances on the price of Ethereum fluctuating wildly from the time the bet is made to the time the outcome is resolved. This might alienate users who are unwilling to assume such a risk or are simply confused by a market denominated in cryptoassets. To their credit, the Augur team has acknowledged this risk and firmly believes the need for a stablecoin will be met – likely by the [MakerDAO project](#).

Valuation:

There are 3 primary drivers of REP value:

- Market Share – the total amount of money being wagered across the entire predictions market. This is also called ‘outstanding interest’. We are projecting this figure based on anticipated penetration rates of the sports gambling, online gambling and financial derivatives markets.
- Network fees – the total amount of fees allocated to active reporters holding REP tokens. Since these fees are paid to reporters, they represent cash flows to REP investors which must be considered for valuation purposes. The rate of these fees is dynamically set by the Augur network and is expected to equal between 1 and 2%. We assume the lower bound of 1% fees throughout our valuation analysis.
- Number of Active Reporters – REP token holders have the option to report or not report on outcomes during any given time window. Those who choose not to report will not receive their allocation of network fees, thereby increasing the cash flow to REP holders who choose to report. We take the most conservative approach in our valuation analysis and assume that 100% of REP holders are actively reporting.

Our valuation analysis will be based on the following projected rates of market penetration per global market sector at the end of each year:

	<i>Market Penetration %</i>			
<u>Global Market</u>	<u>2018</u>	<u>2019</u>	<u>2020</u>	<u>2021</u>
Sports Gambling	0.1500%	0.2750%	0.5000%	1.0000%
Online Gambling	0.7500%	1.3750%	2.5000%	5.0000%
Financial Derivatives	0.0003%	0.0006%	0.0010%	0.0020%

These rates of market penetration lead to the following projected market share dollars per global market sector at the end of each year:



	<i>Market Share \$B</i>			
Global Market	2018	2019	2020	2021
Sports Gambling	4.5	8.3	15.0	30.0
Online Gambling	7.5	13.8	25.0	50.0
Financial Derivatives	3.6	6.6	12.0	24.0
TOTAL \$B	\$ 15.6	\$ 28.6	\$ 52.0	\$ 104.0

From these projected market share figures, we can calculate the expected network fee cash flows attributable to each actively reporting unit of REP:

	2018	2019	2020	2021
Mkt Share \$B	\$ 15.60	\$ 28.60	\$ 52.00	\$ 104.00
REP Fees %	1%	1%	1%	1%
REP Fees \$B	\$ 0.16	\$ 0.29	\$ 0.52	\$ 1.04
REP Active Units %	100%	100%	100%	100%
REP Active Units	11,000,000	11,000,000	11,000,000	11,000,000
REP Fees/Active Unit \$	\$ 14.18	\$ 26.00	\$ 47.27	\$ 94.55

From these projected cash flows attributable to each REP token, we can apply a [discount rate](#) to future cash flows to account for the risk taken and the time value of money. We have chosen to use a 40% discount rate which gives us the distinct discount factors calculated for each year below. We believe this [40% discount rate](#) to be appropriate as it is commonly used to value high-risk, early stage business ventures similar to Augur.

Finally, we apply a comparable [valuation multiple](#) to arrive at the projected REP price each year, net of discount. Valuation multiples are a function of risk, growth and other economic factors. Internet services companies, with their [network effects](#), low [marginal cost of production](#) and [recurring revenue](#) models are the most comparable business sector from which to derive our valuation multiple. As of December 2017, internet services companies were trading at an average [PE ratio of 221.88](#) (price to earnings ratio is the same as valuation multiple). We have chosen to be extremely conservative in this aspect of valuation and will be using 10% of this average PE ratio, giving us a valuation multiple of 22.19:

	2018	2019	2020	2021
Discount Factor	1.4	1.96	2.744	3.8416
REP Fees/Active Unit \$, net	\$ 10.13	\$ 13.27	\$ 17.23	\$ 24.61
Valuation Multiple	22.19	22.19	22.19	22.19
REP Projected Price, net	\$ 224.76	\$ 294.33	\$ 382.25	\$ 546.07



REP Price Predictions



As of this writing, REP tokens are trading at \$27.12 on [secondary markets](#). Based on our projected valuation above, we believe that REP is currently undervalued by over 106% and should be trading at \$56.00. Based on current REP price and our respective end of year projections, we are targeting the following REP prices and associated [ROIs](#):

	2018	2019	2020	2021
REP Projected Price	\$ 224.76	\$ 294.33	\$ 382.25	\$ 546.07
REP Projected ROI \$	\$ 197.64	\$ 267.21	\$ 355.13	\$ 518.95
REP Projected ROI %	629%	885%	1209%	1814%

Other Factors: Coinbase, a major US-based cryptoasset exchange and fiat currency gateway, announced that they would soon be adding ERC20 tokens on their Global Digital Asset Exchange (GDAX). As one of the most mature decentralized application projects in the market today, and because it meets all the [GDAX's new asset listing requirements](#), we believe there is a strong chance Augur will be among the first ERC20 tokens supported by Coinbase.

A listing on GDAX/Coinbase would bode extremely well for the reputation of Augur, as Coinbase has a notoriously stringent listing framework. Also, by providing accessibility to retail investors in a fiat currency gateway, we would expect the price of REP to increase sharply upon listing. For example, in late 2017 Coinbase decided to support Bitcoin Cash on its exchange and the cryptoasset enjoyed an immediate [surge in price](#).

Conclusion: [Parallax Digital](#) firmly believes that a large, accessible and censorship resistant predictions market can create a world with higher quality information. On this front, Augur is the most advanced project in the world and its team has a proven track record of success. We are long on REP.