Chronicles of Ethereum

Part V: The Last Battle – A Valuation Model for Ether

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Contents

Key Takeaways

- Ethereum can be viewed as a business that generates revenue through transaction fees.
- From this perspective, we estimate the price of one Ether to be $2,839, with a feasible range between $224 and $3,943.
- The 90-day annualized price volatility of ETH is ~500% higher than that of the S&P 500.
- New valuation methodologies and assumptions will continue to emerge as blockchain technology matures; our model factors in uncertainty around whether Ethereum can overcome various challenges related to security, volatility, and scalability.
- Our top-down quantitative modelling approach sizes the Total Addressable Market available to all crypto platforms before delving into what share Ethereum can capture; the model can be modified to fit different cryptocurrencies that compete with Ethereum.
- The model can be downloaded here.

Summary

The uncertainty of Ethereum's future is reflected in its native currency's price fluctuations. The Ether's 90-day annualized price volatility exceeded 98% as of late May 2018, approximately six times the S&P 500's volatility over the same period. Questions around whether Ethereum can scale, whether regulators will allow Ethereum to thrive, and whether security vulnerabilities can be satisfactorily rectified, combined with doubt around when the blockchain's user experience will meaningfully improve and skepticism around the true incremental value of distributed ledger technology have created an enormous range of opinions about potential applications of Ethereum's platform.

On top of this, open source development is difficult to manage. For Ethereum, this has manifested itself in technical challenges that have become exponentially more difficult to resolve, primarily because Ethereum's industry-leading adoption levels require new changes to be compatible with more users and more previously developed solutions than its competition. While Ethereum developers continue to rework elemental portions of the platform such as consensus mechanism, interoperability, and governance, other blockchains have iterated on the basic Ethereum smart contract model in an attempt to establish a second-mover advantage. Cardano, BigChainDB, EOS, Ethereum Classic, NEO, QTUM, and Stellar have all designed their infrastructure to strategically chip away at Ethereum's current market dominant position, and for the time being, it appears to be working.

In our view, the aforementioned challenges must be factored into any valuation that claims to be a credible cryptocurrency pricing model. In particular, we believe that where many crypto models go awry is in assuming that the Total Addressable Market for blockchain solutions is unlimited and that all global commerce could one day move to a platform such as Ethereum.

The reality is that blockchain solutions solve a particular type of problem related to the trustworthiness of data. For businesses that do not have significant inefficiencies related to data quality as a ***root cause***, blockchain solutions represent a cumbersome and immature alternative to centralized database solutions and therefore are unlikely to make an impact in these markets.

With this in mind, we offer a quantitative model that can be used to project a long-term price range for the Ether and share our assessment of Ethereum's long-term viability as a cryptocurrency.

Quantitative Model Overview

Below is a high-level overview of our quantitative model for pricing Ether (ETH):

> **Step 1 – Size the Total Addressable Market:** The promise of Ethereum technology centers around creating a platform that facilitates more ***secure, independent, and censorship resistant*** commerce. To accurately estimate the price range of Ether, we must first identify areas of commerce that could meaningfully benefit from the aforementioned enhancements. Once identified, we take a top-down approach to sizing these areas in order to quantify the universe of commerce that Ethereum could theoretically disrupt, in totality (known as the Total Addressable Market, or TAM).
>
> **Step 2 – Size the Served Available Market:** We then estimate the portion of TAM that could migrate to blockchain-enabled smart contract systems, such as Ethereum and other crypto platforms (known as the Served Available Market, or SAM). We use the historical

adoption rates of similarly disruptive technologies as a proxy for how crypto could impact the applicable areas of commerce from Step 1 over the coming 10 years, based on the impact and speed with which we believe crypto will change the industry.

Step 3 – Estimate target market (i.e., the portion of the Served Available Market Ethereum will capture): Next, we factor in competition – Ethereum is contending with multiple other blockchain-enabled smart contract platforms that will also penetrate some portion of the market. We estimate Ethereum's long-term percentage market share of what will become an oligopolistic cryptocurrency landscape.

Step 4 – Estimate percentage transaction fees: We then adjust for the fact that Ether's intended use is as a means to pay transaction fees. More specifically, Ether's purpose is to compensate independent parties (miners) for validating commerce executed on the Ethereum Virtual Machine. This means that only a percentage of the commerce executed on Ethereum's platform will be realized as cash flow to miners who operate Ethereum's protocol.

Step 5 – Calculate the discounted gas fees: Miner cash flows, in the form of transaction fees (i.e., gas fees), can be discounted over our model's projection period to arrive at a present value estimate of the Ethereum network, denominated in US dollars.

Step 6 – Use binomial pricing to calculate value from 'Up-state' and 'Down-state': We then consider that Ethereum is still a nascent technology that must overcome many challenges in order to realize and maintain any long-term value. We adjust the Step 5 estimate of Ethereum's network value by factoring in a potential 'Down-state' scenario that renders Ether worthless. This one period binomial tree valuation relies on an estimate of the project's likelihood of realizing the 'Up-state' versus the 'Down-state' to generate an expected value of the Ethereum network today.

Step 7 – Calculate a per Ether value: We then divide the adjusted Ethereum network value by the estimated long-term supply of Ether to arrive at a price per Ether.

Step 8 – Sensitivity analysis for Ether: Given the uncertainty associated with model assumptions, we create sensitivity analyses to estimate a range of potential long-term values for Ether.

Detailed Quantitative Model Description

The following descriptions elaborate upon our reasoning related to the quantitative model.

Step 1 – Size the Total Addressable Market (TAM)

To identify markets that could be affected by Ethereum's adoption, we thought about the industries that are well-suited to benefit from the unalterable, un-hackable and censorship resistant characteristics of the blockchain. As such, we focused on industries that have clear issues with data quality, trustworthiness between counterparties, and dispersed and/or siloed value chains. In

addition, we considered whether the industries have an existing presence in online commerce, or will eventually evolve into an industry with a significant online presence.[1]

For each chosen industry, we conducted research to [1] identify 2017 market size and [2] predict future growth over the course of our model. Using data from Statista.com and our own beliefs for each sector,[2] we estimate growth as follows:

Internet-of-Things (IoT)	The IoT market is still relatively nascent. Hardware and software technologies continue to be funded and built in large number, particularly in the automobile, home appliance, and manufacturing sectors. Therefore, we project 17% annual growth until 2028, after which time the long-term growth rate of 4% will be achieved.
Energy	Given that the global energy business is comprised of traditional oil/gas and disruptive renewable energy solutions, there is lot of change occurring within the industry. That said, we believe that much of the new technology in this sector will change where humans source their energy as opposed to the amount of energy they consume. Fundamentally, population, economic growth, and energy efficiency improvements will be key drivers for energy demand. As such, we project that the industry should approach long-term growth rate of 4% in 2018 and beyond.
Investments/ Financial Services	With the rise of FinTech, financial services business models that are more than 30 years old are at risk of massive disruption. We project that FinTech sub-sectors, including Alternative Financing, Alternative Lending, and Personal Finance, will approach growth of 18% through 2028. This enormous change reflects the potential for technological change in the sector. Inevitably, 18%+ growth rates will subside as technology's impact is permeated through the market in the decade to come. After 2028, we expect the industry to achieve the long-term 4% annual growth.
Digital Advertising	Digital advertising is a downstream consumer of big data / data brokerage (see below) and is a similarly mature internet industry. In line with recent history gathered from Statista, we expect annual growth to lag behind that of the big data / data brokerage industry. We estimate an annual growth rate approaching 10% through 2028, flattening at the long-term 4% rate thereafter.
Digital Media	The digital media revolution began when YouTube, Netflix, and other entertainment services began to move entertainment consumption to the internet around a decade or more prior to 2018. Therefore, the digital media sector is a relatively mature internet industry. The advent of live streaming and other forms of P2P entertainment leaves room for some growth above

[1] Supply chain logistics remain one use case where cryptocurrency and blockchain data records can add tremendous value to the overall industry. That said, due to the nature of supply chains as business-to-business (B2B) channels, we feel that many blockchain solutions emerging in the space will be private or hybrid in nature, meaning that growth applicable to Ethereum's public network will be somewhat limited when compared to business-to-consumer (B2C) oriented businesses. Therefore, we have excluded this sector from the model.

[2] Please see the 'References' tab in the model worksheet for sources of our information.

	long-term levels in the coming decade. Therefore, we hold annual growth rates at 6% through 2028 and at 4% beyond that time.
Gaming Digital Collectibles	The gaming industry by itself is relatively mature when compared to other internet-based businesses. However, new revenue streams related to digital collectibles and online artwork should increase annual growth rates from the relatively stagnant ~5% levels observed in recent history. We project the adoption of digital collectibles (e.g., CryptoKitties) to drive healthier annual growth rates that approach 8% through 2028 until the long-term 4% growth rate is achieved thereafter.
Remittance/P2P Payments	The Peer-to-Peer (P2P) payment industry is one that could be revolutionarily changed by the advent and adoption of cryptocurrencies, as individuals begin to utilize and understand the benefit of sending instantaneous payment across borders for de minimis fees (a service that most banks are currently unable to match). We project annual growth of 20% through 2028, after which time the long-term growth rate of 4% is achieved.
Big Data/Data Brokerage	Big data data brokerage as an industry has been around for more than a decade, and is closer to maturity than many other internet industries. Particularly in the context of new regulations and scrutiny on how user data is shared and protected (ex, GDPR; the Facebook and Cambridge Analytica incident), we feel that growth in this sector will slow in the future from its recent rates of 20%+. We project annual growth of 12% through 2028, after which time the industry will approach the long-term growth rate of 4%.
Retail eCommerce	Retail Ecommerce is a fairly mature internet industry compared to some of the other emerging internet industries herein. Despite its age, we believe that brick and mortar retail commerce will continue to shift online in the coming decade, driving 15% annual growth figures through 2028, until reaching our long-term estimate of 4% growth in perpetuity. In addition, the recent dominance of B2C, eCommerce platforms such as Amazon suggests that centralized data trustworthiness is not a significant barrier to consumer adoption in the retail sector. Therefore, we foresee blockchain as a viable use case only for localized, P2P commerce, which comprised ~1% of all eCommerce in 2017. We apply our 15% growth assumptions to 1% of 2017's eCommerce TAM to estimate the realistic disrupt-able portion of eCommerce available to Ethereum.
Automated Insurance	While the insurance industry is as old and archaic as other financial services business models, the possibilities of automated insurance provide an unproven yet promising use case of blockchain technology. Decentralized insurance systems could be created to allow small communities to self-insure themselves using smart-contract functionality and their own assets as reserves. While little data exists surrounding this emerging field, we project 10% growth through 2028, after which time the long-term growth rate of 4% will be realized.

Rewards	Rewards programs, or loyalty programs, as they exist today are siloed in nature. While there is some overlap that would allow, for example, airline miles to be used to redeem hotel rooms, most rewards programs do not overlap with one another. Cryptocurrencies and blockchain technology could allow for a liquid marketplace of rewards points, creating a new, more efficient industry from the inefficiencies that exist today. We project 25% growth through 2028, after which time the 4% rate will be achieved.

Model Reference: Please refer to tab 'Model,' section 'Step 1' in our model for details around the Total Addressable Market (TAM) projections.

Step 2 – Size the Served Available Market (SAM)

Next, we estimate the percentage of TAM that will migrate (henceforth referred to as Served Available Market or SAM) to crypto smart contract solutions such as Ethereum and others.

To do so, we look at historical precedent set by the emergence of previous radically disruptive technologies. For five historical scenarios, we gathered data around market penetration rates over the first 10 years post-introduction to the market. We then classified each of the scenarios in terms of how quickly and impactfully the technology was able to capture market share, by assigning the scenario to a low, medium, or high penetration category.[3] We averaged data for scenarios grouped in the same category to arrive at a projected market penetration percentage for low, medium, and high penetration scenarios in each of the first 10 years after introduction. Effectively, we assume 0% crypto adoption today:

	Market share captured by transformative technologies after implementation										
Revolutionary Tech Trend	**Category**	**Year 0**	**Year 1**	**Year 2**	**Year 3**	**Year 4**	**Year 5**	**Year 6**	**Year 7**	**Year 8**	**Year 9**	**Year 10**
Ecommerce vs Brick & Mortar	Low	0.0%	1.3%	2.8%	5.3%	6.1%	7.4%	8.6%	10.2%	11.9%	13.7%	15.5%
Uber/Lyft vs Taxi	Medium	0.0%	0.1%	0.7%	1.1%	3.3%	14.6%	25.0%	27.4%	29.9%	32.6%	35.4%
AirBnB/VRBO vs Hotels	Low	0.0%	0.2%	0.5%	1.0%	1.9%	3.9%	5.5%	8.3%	9.0%	11.0%	13.0%
Netflix/Hulu/ Streaming vs. Cable	Medium	0.0%	3.0%	9.0%	15.0%	23.0%	28.0%	35.0%	43.0%	51.0%	59.0%	63.0%
Smart phones vs feature cell phones	High	0.0%	7.0%	14.0%	15.0%	23.0%	35.0%	48.0%	61.0%	73.0%	79.0%	82.0%

Low Market Penetration	0.0%	0.8%	1.7%	3.2%	4.0%	5.7%	7.1%	9.3%	10.5%	12.4%	14.3%
Medium Market Penetration	0.0%	1.6%	4.9%	8.0%	13.1%	21.3%	30.0%	35.2%	40.5%	45.8%	49.2%
High Market Penetration	0.0%	7.0%	14.0%	15.0%	23.0%	35.0%	48.0%	61.0%	73.0%	79.0%	82.0%

With this data, we assign each industry from Step 1 a category of low, medium or high, in order to estimate crypto's market penetration in that industry over the coming 10 years, as described below. Please note that although some of the rationale in the below table overlaps with our market growth

[3] Low category = market share captured was less than 20% in 10 years; medium category = market share captured was between 20% and 80% captured in 10 years; high category = market share captured was greater than 80% in 10 years

projection rationale from Step 1, this is because in some industries, we believe blockchain will be able to facilitate additional growth in the overall market (i.e., Step 1 projections) as well as attract market share from existing incumbents (i.e., Step 2 projections).

Internet-of-Things (IoT)	**Medium** – Over the coming decade, the explosion of available data that will result from increased adoption of IoT devices will make data quality a paramount challenge for many hardware providers. At the same time, many IoT devices will be owned by centralized technology giants (e.g., Amazon, Google, Apple), automobile makers (e.g., Ford, Honda, Toyota), and other corporations, preventing complete dominance of decentralized public blockchain solutions. As such, we imagine that market penetration of blockchain technologies will be medium.
Energy	**Medium** – Data quality from utilities, power plants, and other renewable energy production mechanisms is difficult to ensure because of siloed meter systems, timing lag between energy production and reporting, and inefficient energy storage technology. While blockchain is positioned to solve these data issues, the lack of streamlined technology systems and the industrial nature of this industry suggest that change may not be rapid. We imagine that market penetration of blockchain technologies will be medium.
Investments/ Financial Services	**Medium** – The scale and resources of existing financial services conglomerates make market penetration for startups difficult. However, growing consumer demand for transparency, ease-of-use, and accessibility, driven primarily by millennials planning their long-term financial futures, offers ample opportunity for decentralized disruption enabled by the blockchain. We imagine the market penetration of blockchain technologies to be medium.
Digital Advertising	**Medium** – Digital advertising has recently been dominated by companies like Facebook and Google, which pose significant barriers to entry for blockchain-enabled startups. Contrarily, we believe there is a real need to improve data quality for online advertisers – a problem that blockchain is uniquely designed to address. As a result, we imagine the market penetration of blockchain technologies to be medium.
Digital Media	**Low** – Media is becoming more decentralized with the advent of micro-influencers and social media platforms like Instagram, making it easy for anyone to be a content creator. However, digital media networks like Comcast/NBC, Universal, FOX, Netflix, and other centralized institutions still pose significant barriers to entry for large scale market penetration. Therefore, we imagine market penetration of blockchain technologies to be low.
Gaming/Digital Collectibles	**High** – The ownership of digital collectibles is a new trend that we believe will become even more popular with improved transparency and validity of ownership and provenance data provided by blockchain technology. Therefore, we imagine market penetration of blockchain technologies to be high.

Remittance/P2P Payments	**High** – The slow processing times and high transaction fees associated with bank transfers make the remittance/P2P payment blockchain use case particularly powerful. As such, we imagine that market penetration of blockchain technologies will be high.
Big Data/Data Brokerage	**High** – Given the digital nature of the industry, combined with a more pressing focus on cybersecurity and data security, we imagine that market penetration of blockchain technologies will be high.
Retail Ecommerce	**Low** – Retail ecommerce has been a fairly successful centralized business model, and therefore we imagine market penetration of blockchain technologies to be low.
Automated Insurance	**High** – We believe that blockchain solutions would be the core infrastructure component upon which a decentralized automated insurance marketplace could be created. Because it is so fundamental to this burgeoning InsurTech field, we estimate that market penetration will be high.
Rewards	**High** – Similar to automated insurance, we believe blockchain solutions would be the core infrastructure component upon which a cross-platform, decentralized loyalty marketplace could be created. Therefore, we estimate that market penetration will be high.

Model Reference: Please refer to tab 'Step 2' in our model for additional background on our assumptions related to SAM.

Step 3 – Estimate target market (i.e., the portion of the SAM Ethereum will capture)

Next, in order to predict how much commerce Ethereum alone will facilitate over the long-term, we project the percentage of SAM that Ethereum can realistically capture while competing with all other available cryptos. We believe the crypto landscape will become an oligopoly over the next decade as the number of coins consolidates from the more than 1,600 cryptocurrencies in existence today to a handful of major players that have hit critical mass and established sufficient network effects in 2028.

To estimate Ethereum's market share as part of this potential oligopoly, we first performed an analysis on pre-existing oligopolistic, tech-oriented industries. For the top six revenue-generating competitors, we identified market share percentage over a historical period of five years. From this data, we were able to calculate the average market share attributable to each of the top six revenue-generating companies in an oligopoly, across tech-oriented industries. These market share averages serve as a proxy for the long-term market share to be captured by Ethereum, pursuant to the position that Ethereum attains within the oligopoly by 2028. For example, based on our results, if Ethereum holds a spot in the top six cryptocurrencies by 2028, we expect it to capture the below market share:

Market Share for Top Six Players in a Tech-Oriented Oligopoly	
1	27.5%
2	22.7%
3	18.5%
4	14.2%
5	9.8%
6	7.3%

While we imagine Ethereum's existing developer following and global notoriety could suffice to keep it a widely adopted cryptocurrency in 2028, we do not foresee Ethereum overtaking Bitcoin in terms of adoption. Though Bitcoin currently has limited smart contract functionality, we believe that by 2028, its own add-on smart contract solutions will rival those of Ethereum. Therefore, we project that Ethereum will remain the number two crypto in the marketplace, and will achieve a long-term market share associated with that position.

We believe that it will take approximately five years for Ethereum to fully realize the market share associated with its number two oligopolistic position. Therefore, over the first half of our model's time period (i.e., 2018 – 2023), we project steady, incremental change from Ethereum's current share of the crypto market to its projected long-term market share starting 2023, after which we hold Ethereum's market share flat at the long-term percentage estimate. As an initial starting point for Ethereum's current crypto market share, we use the percentage of ICO tokens launched on Ethereum versus all available platforms, including Ethereum (i.e., about 91.2%).

Model Reference: Please refer to tab 'Step 3' for additional background on our assumptions related to Ethereum's target market.

Step 4 – Estimate percentage transaction fees

The Ether was intended to be a medium through which to pay transaction fees (known as a gas fees) to miners for validating transactions on the blockchain. Though many people speculate on Ether's price movements today, Ether's fundamental value is founded in its use as gas fee payment. Therefore, in order to accurately gauge the Ethereum network's future cash flows, we must approximate what percentage of commerce executed on Ethereum's platform will be captured as gas fees. We take this step because the Ether's value is not derived directly from the commerce (i.e., the network transaction value) that Ethereum facilitates, but rather indirectly from the value of the transaction fees generated as a result of the commerce it facilitates. In this sense, we are approaching Ethereum as if it were a revenue-generating business, with gas payments being net income.

To project the portion of commerce that Ethereum miners can expect to realize in gas fees, we performed an analysis of transaction fees within each of the industries identified in Step 1. We believe that in each industry, today's existing transaction fee structure would serve as an appropriate measure of miners' transaction fee expectations on Ethereum's platform. To arrive at this industry-specific measure, we either [1] calculated the 'Revenue to Network Transaction Value' ratio for three companies within each industry, which we then averaged to arrive at one industry-specific transaction fee estimate, or [2] researched and directly identified percentage transaction fees associated with each industry:

	'Revenue to Network Transaction Value' ratio, or, percentage transaction fee
IoT	3.7%
Energy	3.7%
Investments/Financial Services	6.6%
Digital Advertising	5.5%
Digital Media	10.0%
Gaming/Digital Collectibles	10.0%
Remittance/P2P Payments	3.7%
Big Data (Data Brokerage)	5.5%
Retail Ecommerce	10.7%
Automated Insurance	6.6%
Rewards	5.5%

Model Reference: Please refer to tab 'Step 4' for additional background on our assumptions related to the projected 'revenue to network transaction value' ratio.

Step 5 – Calculate the discounted gas fees

With the information from Steps 1 to 4, we can now estimate the dollar value of gas fees to be generated by decentralized applications (dApps) on Ethereum over the next 10 years. The below formula is executed for each industry, in each year from 2018 – 2028, as follows:

Step 1	x	Step 2	x	Step 3	x	Step 4	=	Step 5
Estimated yearly industry TAM	x	Percent TAM to be captured by Crypto	x	Percent Crypto to be captured by Ethereum	x	Percent transaction fee	=	Ethereum's undiscounted yearly cash flow, per industry

We calculate the present value of these cash flows by discounting at a 10%[4] rate, which is commensurate with long-term historical returns of emerging markets. To calculate the present value for the terminal year, we use the Gordon Growth Model for a growing dividend. We then sum all industry cash flows across all periods to come up with a present value for the Ethereum network in aggregate.

Model Reference: Please refer to tab 'Model,' section 'Step 5' for additional background on our present value calculations.

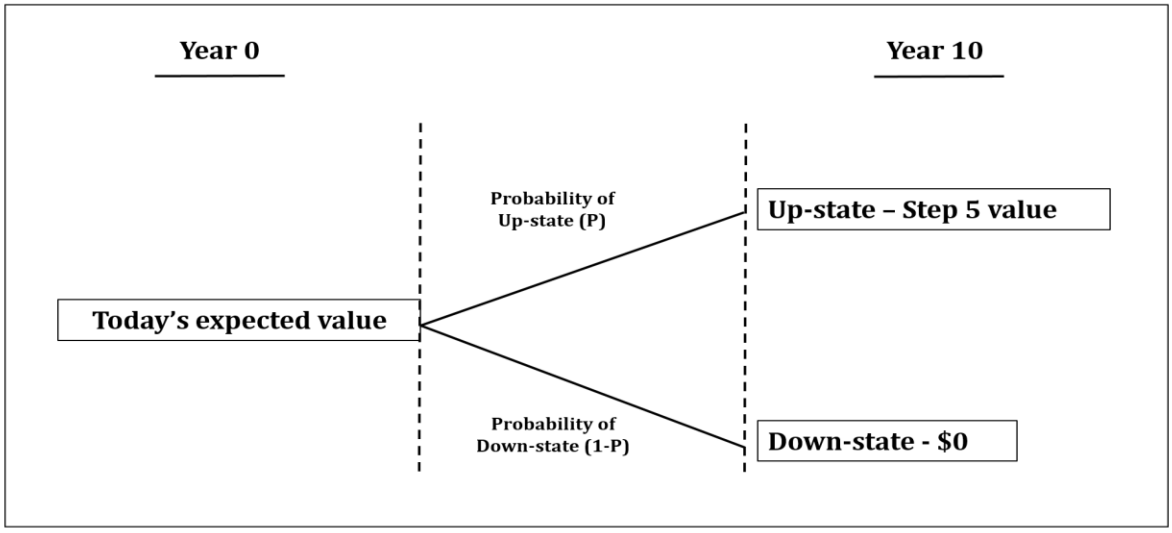
Step 6 – Use binomial pricing to calculate value from 'Up-state' and 'Down-state'

As previously noted, we have valued the Ethereum network assuming it is successful. Using binomial tree valuation methods, we can now factor in the chance that the project does not achieve this success. We assume that if the project does not work, no commerce will migrate to Ethereum

[4] While a 10% discount rate may appear low for an asset as volatile and uncertain as Ether, we address this observation in the following step of our model when we factor in likelihood of failure for the entire Ethereum project. As such, the present value of the Ethereum network calculated in this step assumes that Ethereum has successfully established itself as a platform for future commerce with the critical mass adoption necessary for long-term viability.

and the value of Ether will approach $0 in the long-term. In our valuation calculation, we assume a 10 year holding period (t) to reflect our model's duration:

Simple One Period Binomial Model



Our valuation approach stems from the theory that a rational investor would be willing to pay the expected value of Ether payoffs according to the below formula:

Probability of realizing 'Up-state'	x	'Up-state' payoff	+	Probability of realizing 'Down-state'	x	'Down-state' payoff	=	Step 6
P	x	Step 5 value	+	(1 – P)	x	$0	=	Expected value of Ethereum network

The binomial tree calculation relies on an estimate of Ethereum's likelihood of realizing the 'Up-state' versus the 'Down-state' to generate an expected value of the Ethereum network. Ethereum has established a position as the largest, Turing-complete smart contract enabled cryptocurrency to date. At the same time, regulatory, security, and infrastructure uncertainties suggest that there is a serious potential that the project could be stymied.

To estimate the probability that Ethereum reaches its 'Up-state,' we leveraged a study that examined the mortality rates of firms at different stages after launch.[5] Ethereum is currently finishing its fourth year of operation. Deducing from the study, 50% of firms remain in operation during years 5-14 (i.e., in Ethereum's case, for the 10 years covered by our model). If the study's findings hold true for Ethereum, this implies a 50% chance of realizing the 'Down-state' as well as a

[5] Bhattacharya, Utpal; Borisov, Alexander; Yu, Xiaoyun. "Firm Mortality and Natal Financial Care." Feb/April 2015. Michael G. Foster School of Business, University of Washington. *Journal of Financial and Quantative Analysis*.

50% chance of realizing the 'Up-state.' We felt that a 50% probability of success is appropriate given that the entire blockchain space has yet to prove its longevity.

We then perform our expected value calculation by multiplying the 'Up-state' and 'Down-state' valuations by their respective 50% probabilities, summing the values to arrive at a risk-adjusted value of the Ethereum network.

Model Reference: Please refer to tab 'Model,' section 'Step 6' for additional background on our binomial tree valuation methodology.

Step 7 – Calculate a per Ether value

We now divide the adjusted value of the Ethereum network by the estimated number of outstanding Ether, calculating a price per Ether.

Step 6	**÷**	**Step 7**		
Adjusted Ethereum network value	÷	Projected outstanding Ether	=	$ price per Ether

Given that the Proof of Stake (POS) implementation for Ethereum is impending, we must project the associated rate of inflation in Ether supply over the course of the model's time period (i.e., in the next 10 years). Vitalik Buterin estimates that after POS is implemented, there will be an initial rate of inflation around 5%. In the long term, we imagine this rate will approach that of a stable economy, or around 2%. As such, we estimated inflation using a blended rate (i.e., the 3.5% average) of these two numbers. We extrapolate today's supply using this blended inflation rate to arrive at the 2028 supply of Ether.

In our model's spreadsheet, we have priced Ether using two separate estimates of supply in order to offer alternative methods to our chosen approach. The two separate supply estimates include: [1] the 120 million Ether cap suggested by Buterin in April 2018, and [2] the supply estimate assuming our 3.5% inflation associated with POS holds true in the long-term. We believe the latter option to be the most accurate, and therefore use it in our estimate.

Model Reference: Please refer to tab 'Model,' section 'Step 7' for additional background on our Ether supply calculations.

Step 8 – Sensitivity analysis for Ether

Though all model inputs are uncertain to some degree, we feel the two most indeterminate elements of the analysis herein are [1] the percent likelihood of success of Ethereum in our binomial tree valuation from Step 6, and [2] the long-term inflation rate in supply of Ether from Step 7. Therefore, we created a sensitivity analysis to help show the effects of changes in each of these assumptions, which helps us establish a range of Ether prices that could represent its value.

We believe that Vitalik's initial 5% estimate of inflation will prove to be temporary once the POS system is integrated. Over the long-term, we estimate a feasible range between 2% and 6%.

With such an elaborate set of challenges facing Ethereum, we estimate that its chances of success (i.e., chance of reaching the 'Up-state') fall between 5% and 60%.

Model Reference: Please refer to tab 'Model,' section 'Step 8' for additional background on our sensitivity analyses.

Conclusion

Our model suggests that Ethereum's value could be $2,839, with a range that falls between $224 and $3,943. If our inputs hold true, our estimate suggests that Ethereum is undervalued compared to its $273 price at the time of writing.

We recognize that many assumptions and inputs were made to arrive at these conclusions. The factors that drive Ether's price movements are numerous, and in many cases still not well-understood. As blockchain technology evolves, business-people and investors will continue to become more familiar with the true underlying potential of cryptocurrencies and the projects they make possible. A better-informed market will eventually reduce price volatility and lead to new valuation assumptions and inputs that are more tailored to the nuances of specific blockchain projects and industry developments.

We view our model as one framework for thinking about cryptocurrency valuation, and we seek to add to the growing body of research regarding the pricing of cryptocurrency assets. As new information is released, adjustments to our model and its inputs will inevitably be necessary. We invite our readers to modify our model[6] by downloading our template here. Despite having focused on Ethereum as the subject of our valuation, the model framework we have laid out can be used for other smart contract-enabled cryptocurrencies aside from Ethereum.

[6] Please see the 'References' tab in the model worksheet for sources of our information.

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