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# Ethereum — A Generational Investment

## 1. Part I — Introduction

This piece explains why I think Ethereum is a generational investment headed into 2022. My explanation begins with some important context about how I think about “cryptocurrencies”. In 2008, when Satoshi published the Bitcoin whitepaper, the blockchain ecosystem was born. At the time, the term “cryptocurrency” was apt. Bitcoin was the first cryptocurrency and it was launched on the breakthrough innovation of distributed trust, built on a blockchain, to create the first ever crypto(graphic) currency. This was the blockchain’s first use case. Bitcoin’s primary utility was (and still is) to be the currency of the Bitcoin blockchain network. Since 2008 the broader cryptocurrency ecosystem has evolved significantly. Today, the term “cryptocurrency” no longer fully captures what blockchain tokens represent. While tokens are still used as native currencies, many also exhibit a second function as equity stakes in their native blockchain projects. This new use case was enabled by the advent of Proof-of-Stake (PoS), which re-allocated block rewards to stakers rather than miners, thereby directly monetizing the value of the network in the hands of its owners. A token holder in a PoS blockchain can stake their tokens and claim their proportional share of fees generated on the network. These fees constitute the revenue generated on the network. A staker receiving their direct share in the value generated by the utility of the network is equivalent to the holder of a traditional equity instrument receiving dividend payments. Cryptocurrencies can be thought of and analyzed in similar ways to traditional equities. **The massive inflection about to take place in post-Merge ETH represents an investment opportunity of extraordinary significance.**

Some crypto investors believe that using traditional equity frameworks for valuing crypto projects is misguided and does not address dynamics unique to the crypto space. Historically, this has been true as tokens have tended to trade more around narratives and less around fundamental values. However, if you look closely there are already inklings of traditional fundamentals impacting price (why is BNB the third largest crypto asset despite a terrible narrative? Fundamentals). Additionally, in my opinion, valuing crypto tokens purely on speculative value is unreliable for the long term and I would expect the industry to increasingly reflect fundamental value as it matures. At the end of the day price is purely a reflection of supply and demand. When aggregate values are still relatively low (Yes, \$1.6T is still relatively low compared to other asset classes) speculative demand can support prices. Longer term, I believe crypto projects will need to become profitable and have a mechanism of returning that profit to holders if they are to support value as that \$1.6T number grows, which I suspect is likely.

While I place a lot of weight on potential profitability of crypto projects, cryptocurrencies also have an important second value proposition that traditional equities do not. As mentioned earlier, these tokens are still used as the native currencies of their respective blockchain ecosystems. This currency use case has evolved significantly from the early Bitcoin days. Initially, cryptocurrencies were only used to make payments from one party to another. In recent years blockchain ecosystems have meaningfully evolved such that today these tokens are used for a much broader swath of activities more closely resembling a full-fledged economy rather than a simple peer to peer payment system. In this context, we have two primary forms of value for blockchain tokens.

### 1. Present Value of Future Cash Flows

a. As a token holder you have the right to stake your tokens and receive your share of future revenues generated by the network.

### 2. Monetary Premium Derived from the Native Currency Use Case

a. Tokens are required to participate in the blockchain economy creating demand for tokens as users purchase them to engage in the blockchain economy. This is similar to the value of fiat currencies.



revenues generated by the network, but your share is not static. Blockchain projects also have expenses, and these expenses do not look like the cash expenses from traditional equities. While projects do have some cash expenses, the majority of their expenses are paid as issuance akin to stock-based compensation (SBC). While issuance does not reduce your dividend payments immediately, it reduces the share of future dividends you receive. This therefore reduces the present value of future cash flows, which then flows through to a decline in the value proposition.

It is important to understand not only the yield of a token, but also where that yield comes from and its sustainability over the long term. It is not viable for a token to inflate supply exponentially over the long term as math dictates this would cause price to asymptotically approach zero, assuming market capitalization is capped at some limit (global M2 if nothing else). L1 blockchains must reach a point where fee revenue at least covers the cost of security (issuance to validators) in order to be sustainable over the long term. Importantly, this is also what is best for the users especially when they are the owners of the chain.

It is useful to view an exaggerated edge case to illustrate this. Assume a chain scales to a point of offering millions of TPS for a fraction of a penny, but also assume this same chain is required to issue 100% of supply annually to compensate validators. This chain would offer unrivaled performance, but the tokens outstanding would grow exponentially, and the value of each individual token would approach 0 no matter how many users it attracted. This dynamic would have a very negative effect on the development and security of the chain and the chain would likely fail. So long as a blockchain's fee revenue does not cover their cost of validation, they will always trend toward this unfortunate terminal state and will not be sustainable over the long term. One of the main reasons for this is that the costs of validation are determined as a proportion of market cap rather than a fixed fiat-denominate expense. This makes it impossible for chains to grow out of this expense unless they generate a source of revenue that also scales comparably with market cap to offset this validator cost.

## 2. Part II — The Fundamentals

In Part II, I will explain my core value capture methods discussed above. In Part III, I will engage in a more tactical discussion about why I am particularly bullish on the price of ETH into the upcoming transition to PoS planned for 2022. Generally, I think my tactical view is more developed and insightful than my fundamental view and likely contains more “alpha”. Therefore, if you are not particularly interested in fundamentals or my view on them you can skip directly to Part III.

2021 has been dominated by debate around the competition between Ethereum and Alternate Layer 1 blockchains (Alt L1's). Many people point to Ethereum's stagnant growth vs. Alt L1's such as Avalanche and Solana as a proof point that Ethereum is failing and losing its place as the dominant L1. There is an assumption in the L1 space that L1's should strive to reduce fees to their lowest possible level and that high fees are “extractive”. This assumption leads to a prevailing view that when blockchains charge users fees, this is not an act of “making” money but rather “taking” money.

I find this view somewhat odd and anti-capitalist. When HBO charges high membership fees for providing the highest quality TV shows no one accuses them of being “extractive”, because the user understands those fees are required to provide the quality of the product they receive. The same is true for Apple when the company charges a premium for the best smartphones. People do not attack them for “taking” users money, instead they laud them for providing extraordinary products. The same can be said about Ethereum and the block space they provide. The high cost is a direct result of the quality of the block space. In the case of block space, quality is measured by security and decentralization. Ethereum provides the most secure and most decentralized block space and as a direct result charges the highest fees as the blockchain trilemma dictates these two qualities necessarily come at the expense of scalability. Of course, Ethereum should try to reduce fees, and they are trying, but to suggest they are “taking” users money because they are choosing to prioritize decentralization and security first, ignores the fundamentals of the blockchain space.



transactions to capture the same amount of value. To be clear I do believe in Ethereum's scaling roadmap and the vision to become a "chain of chains." In this potential future, there will likely only be two types of transactions on Ethereum L1; whale transactions and roll up transactions. Both of these are likely to fall into the premium transaction bucket and represent significant value per transaction. This will also allow Ethereum to scale, offer significantly lower fees to users, attract additional users and retain leading decentralization and security. However, that is not my primary point. I think long term, Ethereum's decision to prioritize the quality of its block space vs. the quantity of it, will not only prove to be the best decision for the crypto ecosystem, but also for the value capture properties of ETH the asset.

The above largely focuses on how things will evolve in the future, but how do they look today? At present Ethereum generates ~\$40m/day of fee revenue, which equates to a ~\$12B/year run rate. This is over 20x the second L1, BSC, and many multiples of all other Alt L1's.

Name	▼ 1 Day Fees	7 Day Avg. Fees
 Ethereum	\$39,241,634.89	\$46,883,224.39 ▼
 Uniswap	\$2,124,375.64	\$2,831,800.23 ▼
 Binance Smart Chain	\$2,044,199.58	\$2,279,206.46 ▼
 Compound	\$638,290.46	\$600,401.49 ▼
 Aave	\$545,729.93	\$1,030,649.01 ▼
 Avalanche	\$531,014.37	\$433,531.61 ▼
 SushiSwap	\$526,216.06	\$944,081.00 ▼
 Abracadabra.money	\$453,826.47	\$503,172.51 ▼
 MakerDAO	\$363,642.04	\$362,282.82 ▼
 Bitcoin	\$360,530.82	\$371,273.52 ▼
 SpookySwap	\$298,492.50	\$577,280.72 ▼
 Fantom	\$254,781.99	\$237,823.45 ▼
 Trader Joe	\$227,409.55	\$514,081.24 ▼
 Balancer	\$178,342.60	\$176,742.94 ▼
 Polygon	\$163,566.10	\$125,881.17 ▼

At a fundamental level, if you account for the fact that most of Ethereum is not staked and likely will remain that way and normalize for post PoS issuance, Ethereum is trading at ~10x projected annualized earnings from the perspective of a staker. The numbers behind this are quite interesting and be found in the table below. In short, assuming a 30% staking participation rate (large increase from today's 9%) a staker makes ~9% from staking and another 1.3% as the entire network is projected to be net 1.3% deflationary. Stakers will receive a net 10% of total earnings power, which equates to  $100/10 = \sim 10x$  earnings. This calculation is much less favorable for other L1's that do not generate fees, because while you receive a staking yield your stake also gets diluted at nearly that same rate, so you have almost zero net income (extremely high PE multiple).

<b>ETH Staking Statistics (Post PoS Participation Rate)</b>	
Tokens Outstanding	118
Staked Tokens	35.4
% of Tokens Staked	30.0%
Annual Fee Run Rate (ETH)	4.75
% Burned	70%
ETH Burned	3.32
Validator Transaction Rewards	1.42
Total Revenue	4.75
Staking Issuance Rate	5%
Issuance	1.77
Staking Return	9%
Net Income from Staking (% return)	9.0%
Net Income from (Burn - Issuance)	1.3%
Normalized Net Income to Stakers	10%
<b>Adjusted Equivalent PE Ratio</b>	<b>9.7x</b>

~10x PE is unfathomably cheap for an asset growing as quickly as Ethereum (total revenue up ~1500% y/y) especially when you consider it likely has the largest TAM of any asset in the world.

In addition, I believe Ethereum also possesses the most significant monetary premium value. This is not only represented by the massive TVL lead it has on every other chain, but also the fact that by far the most vibrant economy of NFT's and other digital assets lives on Ethereum. More detail is required to provide a thorough analysis of these fundamentals, but the main point I am trying to make is that from a fundamental perspective Ethereum is head and shoulders above all other L1's when it comes to value capture. If people are interested in more detailed thoughts on this, I can follow up with some more in-depth thoughts.

With all of this said I believe that fundamentals actually do not directly influence asset prices — assets are priced as a function of supply and demand. Fundamentals often influence supply and demand over the medium to long term, but even over these extended periods their impact on asset prices is only indirect and depends on the ability to alter supply and demand. However, in the case of ETH, fundamentals are linked with supply and demand much more directly than for other financial assets. ETH's expenses are paid in issuance, which *directly* flow into structural sell pressure. ETH's revenue is derived from fees, which *directly* flow into structural buy pressure. In light of this, I will explain why I think Ethereum's fundamentals are likely to dramatically improve over the next 6 months and how this will be reflected in supply and demand. Furthermore, there are multiple non-fundamental factors that will likely have an equally large impact on supply and demand for ETH. Many people have written about the impact the Merge is likely to have on ETH prices, but I believe there are a few dynamics that have not yet been discussed and will try to shed light on those. I will also try to provide a comprehensive overview of why I think ETH represents a generational risk adjusted investment opportunity over the next 6 months.

### 3. Part III — The Trade

Before we dive into the details of the Ethereum thesis I will first provide some context around how I view the supply demand dynamics for the entire crypto complex. In my view, over a short period of time prices are driven by *discretionary* supply and demand, but over the medium to long term they are driven by *structural* supply and demand. While structural forces often only make up a small portion of daily volume, the fact that they are structural and repeat for long periods of time makes their impact

extremely strong over the long term. As a general rule I view any structural force that makes up at least 1% of directional volume as very significant.

The interplay between discretionary and structural supply and demand explains why so many new project launches show strong price appreciation at inception. Generally, they launch with the majority of supply locked up and therefore discretionary demand is enough to drive steep price increases. However, over the longer term as supply unlocks this produces a *structural* seller, which, unless projects are able to create *structural* demand, tends to cause initial price appreciation to fade dramatically over time.

There is an even more interesting structural supply dynamic when it comes to PoW blockchain projects. This impact is important to understand as it tends to drive the entire crypto market as ETH and BTC are PoW chains and make up over 60% of total crypto market cap. With PoW chains all new issuance goes to miners. These mining organizations are generally run as professional enterprises and are not just mining to accumulate more cryptocurrency. Additionally, they have significant real-world expenses such as utilities (mainly electricity), rent and hardware. As a result, typically, they structurally sell a portion of the mining rewards they receive to cover expenses and turn a profit. The proportion that they sell varies from miner to miner. Some sell all, some sell none and everything in between. After speaking to a few of these organizations, I estimate on average they sell between 80–90% of total issuance they receive. This creates a daily seller in the market that is indiscriminately selling newly minted tokens every single day. However, this structural seller is unique in that the notional amount they sell is denominated in tokens and not in fiat. This is an extremely important distinction. It means that notional sell pressure as denominated in fiat scales linearly with the price of the asset.

As this is a key point its worth examining the mechanics in detail. Using ETH as an example, miners receive ~15k tokens/day. This can be thought of as dilutive issuance of SBC. If we assume miners sell 85% of these tokens that is ~13k tokens that are structurally sold each day. When Ethereum was trading at \$100/token, not long ago, this equated to \$1.3mm/day and it is not difficult to offset this amount of structural selling. However, at \$3,000/token, miner selling then equates to ~\$40mm/day. This may not sound like a huge amount but think about what it means when you extrapolate. It

equates to ~\$1.2B/month and ~\$14B/year. That is vast quantity of supply that needs to be absorbed each year, just to maintain current prices, and even more is required to generate price increases. The numbers are also very similar with Bitcoin. Using similar assumptions, Bitcoin has ~\$25mm of daily sell pressure, which equates to ~\$800mm/month and ~\$10B/year. Leaving aside all other structural supply and all discretionary supply, this means that crypto as an asset class must attract over ~\$22B/year to maintain current prices.

This, however, only looks at the supply side of the equation. The demand side is equally important. For both assets there is a portion of holders that simply buy every finite time period (day / week / month / paycheck etc.) that produces structural demand to offset some of the structural supply. This structural demand is fiat-denominated. These buyers are generally not paid in ETH tokens, but rather in fiat currency. As a result, if the price of crypto assets goes up, they do not get a bigger paycheck every month to buy more crypto with.

Importantly, in the case of ETH and other fee generating chains there is also a second source of structural demand. Since EIP-1559, which took place in August '21, ~70% of fees are burned. A good analogy for this is if Apple charged for iPhones in Apple shares instead of fiat currency. After receiving your Apple shares for an iPhone, Apple would then retire 70% of the shares and redistribute the remaining 30% back to existing shareholders as a stock dividend. The Ethereum "burn" is often thought of as direct buy pressure, but in fact it is actually not *direct* buy pressure. Rather it is *indirect* buy pressure. When fees are burned, they are not bought back from the open market, instead they are retired from the existing float. However, if you are a user who has just spent some ETH using the Ethereum network you likely fall into one of two buckets. You are likely either:

1. An Investor in ETH who has allocated a portion of your investment portfolio to ETH and also happen to be using the network
2. A more utility focused user of Ethereum using the network for NFT's, DeFi, Gaming etc, do not hold Ethereum as an investment, but only to pay for the fees associated with your usage

In case #1, you will likely want to maintain your allocation to ETH and periodically top up your investment by buying back the tokens you have lost as a result of paying for transactions. In case #2, you will also have to buy back the tokens you spend periodically as otherwise you will run out of tokens and not be able to perform the utilities you desire. These two may overlap somewhat but primary point is that no matter what, the users having their fees burned will periodically buy these tokens back. Therefore, while the fee burn does not directly create buying pressure it does do so indirectly with a high degree of certainty and can be thought of as a stock buyback. As Ethereum is running at a rate of \$40mm fees/day this equates to roughly \$30mm/day of structural indirect buy pressure and offsets most of structural sell pressure at current conditions. This is a very meaningful impact but will become significantly more impactful after the Merge, which we will get into more detail on later.

The most important part of this supply demand dynamic is that crypto is a unique asset class — structural supply scales linearly with price. This creates a fundamental mismatch where structural supply is denominated in tokens whereas structural demand is denominated in fiat. This means that as prices appreciate, this reflexively creates more structural supply and vice versa when prices decline, this reduces structural supply. Crypto assets are unique in this respect. Traditional equities do also pay out SBC, and a portion of this SBC is structurally sold. However, traditional equities denominate these SBC payments in fiat and not stock, meaning they decide they will pay out a certain amount of money, say \$10mm annually in SBC and then divide this number by the stock price to arrive at the amount they will pay out. They do not decide that they will pay out 1,000 shares each year and just double the fiat-denominated amount of SBC if the share prices happens to double. Crypto assets DO pay out issuance in this matter. In my opinion, this structural dynamic is one of the most important fundamental links that has driven the historically cyclical price action of the entire crypto market.

Generally, cycles work as follows. Prices start to rise, which draws in hype, which causes large discretionary buying and is capable of pushing price up quickly. However, as the price increases, it creates additional structural supply, which eventually saturates discretionary demand and pushes prices back down. Prices then overshoot to the downside and simultaneously reduce structural demand leading to a bottoming process. Rinse and repeat. It is the structural supply/demand mismatch that creates

this reflexive force, which in turn causes the cyclical mean reversion. In my view, this explains why crypto bull runs have historically not been sustainable and why Ethereum's transition to PoS will be such an important event. **Unlike Bitcoin, which will always have this structural supply issue capping price appreciation, once Ethereum shifts to a PoS architecture, it will break free of this dynamic permanently. Not only will this be massively positive for Ethereum, but it will be healthy for the entire Crypto market.**

	ETH Before The Merge	ETH After The Merge	Delta	Bitcoin
<b>Income Statement View</b>				
<b>Daily Revenue (\$mm)</b>	<b>\$40</b>	<b>\$40</b>	<b>-</b>	<b>\$0.73</b>
Annual Issuance (mm Tokens)	5.4	1.35	(75%)	0.32
Daily Issuance (Tokens)	14,795	3,699	(11,096)	870
Token Price	\$2,400	\$2,400	-	\$35,000
<b>Daily Expenses (\$mm)</b>	<b>(\$36)</b>	<b>(\$9)</b>	<b>\$27</b>	<b>(\$30)</b>
<b>Daily Net Income (\$mm)</b>	<b>\$4</b>	<b>\$31</b>	<b>\$27</b>	<b>(\$30)</b>
<b>Buy/Sell Pressure Analysis</b>				
% of Daily Issuance Sold	85%	10%	(75%)	85%
<b>Daily Sold (Tokens)</b>	<b>12,575</b>	<b>370</b>	<b>(12,205)</b>	<b>740</b>
% Revenue Burned	70%	70%	-	-
Daily Revenue Burned (\$mm)	\$28	\$28	-	-
<b>Daily Tokens Burned</b>	<b>11,667</b>	<b>11,667</b>	<b>-</b>	<b>-</b>
<b>Daily Net Buy / (Sell) Pressure (Tokens)</b>	<b>(909)</b>	<b>11,297</b>	<b>12,205</b>	<b>(740)</b>
<b>Daily Net Buy / (Sell) Pressure (\$mm)</b>	<b>(\$2.2)</b>	<b>\$27.1</b>	<b>\$29.3</b>	<b>(\$25.9)</b>

At a fundamental level, when Ethereum moves to PoS, miners will be obviated. The network will stop being validated by miners and instead this work will shift to stakers. Today, there is already a PoS Ethereum chain called the Beacon chain which runs in parallel to the primary PoW chain. What changes with the Merge is that the two chains merge together and all the important activity shifts to the PoS Beacon chain and therefore the PoW chain is no longer required. This transition will occur at one discrete moment in time and will not be gradual. Once the Merge has occurred, miners are no longer required, and all issuance is allocated to stakers. Stakers require only a fraction of the issuance that miners do. PoS require significantly less issuance than PoW to provide the same level of security so there is no security reduction in conjunction with the issuance reduction. It is a move from a less efficient system to a more efficient one.

The first principles around why PoS is more efficient are quite interesting but somewhat detailed, so I have moved that discussion to the Appendix. If we merged today issuance would be reduced 90% (from ~15k tokens/day to ~1.5k tokens/day). In reality over the longer term the issuance reduction will be less acute as PoS issuance is correlated with staking participation, which will very likely rise post merge. I expect the actual reduction to be in the 60–70% range based off the following assumptions.

<b>ETH Issuance Statistics</b>	
Tokens Outstanding	118
Current Issuance	5.5
Post PoS Staking Participation	30%
Staking Issuance Rate	5%
Post PoS Issuance	1.77
Issuance Reduction	3.73
<b>% Issuance Reduction</b>	<b>68%</b>

While the gross issuance reduction will be in the 60–70% range, the implications for daily sell pressure are a bit more complex. We assume that 85% of miner issuance is sold into the market, but what about staking issuance? Stakers do not have high fixed costs, generally they have no additional cost at all, so there is no need to sell a portion of issuance to cover expenses. Stakers also, by definition, own a stake of ETH. Therefore, they are likely to believe in the ETH investment thesis. In aggregate this will make them less likely to sell their future issuance. I am an active ETH staker and know many others, generally we stake because we *want* more ETH. In this context, while gross issuance is reduced 60–70% I would expect sell pressure to be reduced closer to 90% as the majority of staking rewards likely do not find their way back onto the open market. Furthermore, for the first few months after the merge, stakers won't even be able to withdraw their issuance rewards so the initial reduction will be near 100%.

I have outlined why structural supply of ETH will decline 100%, initially, and likely ~90% longer term, the moment Ethereum transitions to PoS, but what about the

structural demand side of the equation? Well, the Merge actually does not change the fee revenue much. This will come later with greater roll-up adoption and sharding. So, the structural demand will largely remain unchanged. I would actually expect it to increase around the Merge event in particular as activity will pick up before and through the Merge, increasing the daily fee revenue. However, to be conservative I have assumed the daily structural demand remains unchanged in my calculations.

Now let's evaluate the potential impact of this structural change. ETH will shift from an environment of \$35mm structural supply and \$30mm structural demand to one of 0-\$5m structural supply and the same \$30mm of structural demand. This will produce a profound shift, the significance of which cannot be overstated. Many have equated this supply reduction to the equivalent of a "triple halving" in Bitcoin terms, but it is even more significant than that. Issuance will be reduced ~70% (which actually only equates to a double halving), the daily sell pressure is reduced ~90% (issuance and sell pressure are not the same) and this enables Ethereum to switch from a structural supply asset to a structural demand asset. This will be one of the first times in history that there is a large crypto asset with continuous structural demand and has never happened at this scale[1]. **From a price action perspective, it will switch from an environment that needs ~\$5mm of new money entering the asset on a daily basis just to maintain current prices to an environment that will require ~\$30mm of existing holders to sell their tokens every day just to maintain a level price without going up.** Even ignoring the discretionary impact of the merge, which we will discuss shortly, this structural shift alone is enough to drive dramatic price appreciation.

What about discretionary supply and demand? This is where things start to get even more interesting. One of the effects of the Merge is to reallocate validator rewards from miners to stakers. Right now, miners receive 90% of issuance while stakers receive the remaining 10%. After the merge, stakers will get 100% of issuance and transaction fees. If you add these up and run the numbers, if the merge were to occur today, the ETH staking reward would be ~20%.

ETH Staking Statistics	
Tokens Outstanding	118
Staked Tokens	9
% of Tokens Staked	7.6%
Daily Fee Run Rate (mm ETH)	0.012
Annual Fee Run Rate (Bn ETH)	4.38
% Burned	70%
ETH Burned	3.07
Validator Transaction Rewards	1.31
Staking Issuance Rate	5%
Issuance	0.45
Total Validator Reward	1.76
<b>Staking Return</b>	<b>19.6%</b>

There are two factors which cause this rate to be so high. The first is the fact that ETH generates a very large fee pool. The second is the very low staking participation rate.

#	Asset	Price	24h	Reward	Staked Value	Market Cap	Total Staked	7d Price Change	Add
1	Solana SOL	\$200.37	+0.87%	6.09%	\$78,877,783,821	\$62,144,083,331	76.78%		+
2	Cardano ADA	\$1.55	+6.16%	5.65%	\$36,746,388,021	\$49,671,716,323	70%		+
3	Ethereum 2.0 ETH	\$4,077.18	-0.22%	5.07%	\$34,842,793,151	\$484,841,703,437	718%		+
4	Terra LUNA	\$93.27	-5.1%	7.35%	\$29,057,072,174	\$34,018,723,153	37.21%		+
5	Avalanche AVAX	\$117.43	-0.12%	9.34%	\$27,725,412,887	\$28,681,823,676	59.67%		+
6	Polkadot DOT	\$32.18	+4.01%	13.94%	\$19,982,412,361	\$34,570,819,409	53.94%		+
7	Algorand ALGO	\$1.67	+3.09%	2.53%	\$11,425,268,369	\$10,684,016,558	46.54%		+
8	Binance Smart C BNB	\$568.38	+3.48%	16.54%	\$10,612,443,151	\$95,566,370,067	82.63%		+

Currently, only ~7% of ETH is staked. This is due to several reasons. First, the current 5% staking reward is relatively low. The second and less obvious reason is that ETH has very strong token distribution. There are no large VC's holding significant portion of the supply unlike other chains. Generally, these large holders have a very high staking participation rate, their lack of existence on the ETH cap table pushes down the staking participation rate meaningfully. Finally, as there are a lot of other things to do with your ETH (ETH is the base pair in almost all large LP's for example) this also drives down staking participation rate. Anything that reduces staking participation rate is good for fundamentals as it creates an opportunity for those that do stake to receive an outsized share of total rewards. It also means that issuance is reduced which is another advantage.

With that said, I would not expect staking participation to remain this low post-Merge once the staking APR resets and stakers can more easily withdraw their stakes. In practice, when the reward resets to a 20% rate this will cause a lot capital to flow into ETH staking to capture that high rate. Some of this capital will come from dormant ETH stakes that had not been incentivized enough by the 5% rate but would change their mind at a 20% rate. However, an additional portion will come from fresh capital that purchases ETH *because* the staking reward is so high. I assume that the staking reward will settle somewhere around 10% in the medium term which implies another ~8.8mm tokens will need to be staked. If we assume 75% of that comes from dormant ETH and 25% comes from fresh capital this leads to approximately 2.2mm ETH tokens that need to be purchased post merge. This equates to ~\$9B at current prices and is an enormous amount of discretionary demand to be absorbed.

The rest of the discretionary supply/demand story is more subjective. On the demand side, there will be those that seek to buy ETH on the Merge narrative (green energy, best in class dev team that finally pulled off one the largest upgrades in the history, drastic improvement in fundamentals). On the sell side will be everyone who bought ETH before the merge in expectation of the Merge and would now be looking to "sell the news."

Things can, and likely will, change between now and when the Merge actually occurs, but today I think the pool of discretionary crypto traders is actually underweight ETH relative to other L1's. The narrative throughout 2021 has been that of the "ETH killers"

and many have dramatically outperformed ETH. Being overweight Sol/AVAX, underweight ETH has been the dominant trade of 2021. Ethereum is one of the most hated assets in crypto right now due to the high fee narrative, and this creates a situation where many traders are going to be offside as the Merge approaches and the narrative flips. In this context, I think there will be a meaningful amount of capital that flows into ETH once the Merge comes into focus and people better appreciate the significance of it. Crypto traders love to trade narratives, and this is likely going to be one of the strongest narratives we have ever seen and importantly, will also be backed up by generational fundamentals.

The reason these traders haven't already begun allocating to ETH in anticipation of the Merge is that generally crypto traders have a very short time horizon and think in terms of hours/days/weeks rather than months/years. This is not a knock on them, the crypto space moves extremely quickly and, this short-term thinking is required to capitalize on many opportunities. However, it does mean that most likely haven't started positioning for the Merge yet. Timing is uncertain, but I expect the merge to occur in the May/June timeframe. While its always possible for things to change, I have spent a lot of time doing research to inform this view, so I am quite confident in it.

On top of this there is another 2nd order effect that I have not seen discussed elsewhere. One of the use cases for cryptocurrency is as a decentralized store of value, a "Digital Gold". To date, Ethereum and Bitcoin have primarily competed for this use case and so far, Bitcoin has won, as evidenced by its significantly larger market cap despite significantly reduced utility. However, one of the major limitations of greater adoption for both assets has been their extreme volatility. Part of the reason gold is used a store of value is because it is generally very stable, especially in negative macro-economic environments. One of the reasons BTC and ETH have struggled so much in these environments is because they are fundamentally structural supply assets, so in these periods of stress when there are already plenty of sellers there is an additional net seller every day. Once ETH becomes a structural demand asset, I would expect it to exhibit meaningfully greater stability, especially in times of stress, than Bitcoin, which will forever remain a structural supply asset. This should help ETH make headway against BTC in the SoV competition and will likely lead to a consistent increase in discretionary demand for ETH post merge. To be clear, around the actual Merge event I expect massive volatility, but after things settle out in the months after the event ETH

should find a new equilibrium (likely much higher) and become the most stable asset in crypto.

To summarize its helpful to break down the supply and demand buckets into discrete components.

A. Structural Supply — Miner selling to cover costs and turn a profit (Currently \$40m daily seller)

B. Structural Demand — Users buying back ETH spent on transactions (Currently \$30m daily buyer)

C. Recurring Discretionary Demand — Investors/Users that indiscriminately purchase ETH on a recurring basis (think Sassal). This is the group that keeps ETH in equilibrium despite ETH currently being a structural supply asset (currently \$10m daily buyer)

D. Non-Recurring Discretionary Supply/Demand — The combination of new capital that is likely to buy ETH to stake it and the discretionary investors/traders that are likely to buy ETH for the other reasons discussed above (~\$9B of staking related demand plus an additional \$1–10B of other discretionary demand)

Putting it all together, currently, ETH prices have reached an equilibrium where there are enough discretionary buyers (Group C) to absorb the daily miner sell pressure (Group A). Once the Merge occurs you will be left with an environment where the structural buyers (Group B) are still buying, the existing recurring demand (Group C) still needs to be absorbed, and the structural supply (Group A) that had been filling all these buyers vanishes at one discrete moment in time. On top of this, you will likely have over ~\$10B, and potentially much more, of discretionary demand (Group D) that needs to purchase ETH into and through the Merge. In aggregate, there will be unprecedented structural and discretionary demand for ETH just as the primary structural seller of ETH is removed. There will be many buyers of ETH and no one willing to sell to them. **We have seen large moves and supply shocks in crypto before, but I believe the Merge will create the largest and most violent one we have ever seen at scale.**

In aggregate the ETH investment opportunity over the next 6 months is unique and in all likelihood we will never see another set-up like it. For this foundation to be laid two distinct conditions needed to be met. First, a PoW asset transitioning to PoS. The significance of the event is not that ETH will *end up* PoS. It is significant because the established equilibrium under PoW conditions will be flipped 180 degrees at one discrete moment. It is the *transition* that is significant. Given that most crypto projects now launch as PoS from the start, these transitions will likely be extremely rare going forward. Second, there needed to be an L1 with significant fee revenue to allow for a strong structural demand asset to be born. As shown earlier, ETH generates over 10x more fee revenue than any other L1 so this is also unlikely to repeat. Finally, for the impact to truly be powerful you need BOTH of these uncorrelated conditions to be met at the same time.

#### 4. Part IV — FAQ's/Appendix

##### **Everyone already knows about the merge; doesn't that mean it's already priced in?**

I would agree, nearly all educated crypto participants know the Merge is expected in 2022. However, only a small subset of those people, maybe 20%, truly understand its significance and an even smaller subset of those people are actively increasing their ETH allocation at this time as the timing is still uncertain. Furthermore, even if there was a much larger portion of people actively positioning for the Merge, I still don't think very much of the move would be priced in. To understand why, its important to first look at the three types of catalysts that exist with financial assets.

First, there are fundamental catalysts. For example, Company A comes out with an earnings release that shows better than expected results. This will not directly impact supply and demand; however, it has the potential to do so indirectly. This indirect impact will be determined by the events ability to change people's perception of company A and therefore get them to act by buying more or selling less of company A and therefore impact supply and demand. If however, everyone already expected company A to beat earnings and is not surprised then there will likely be no change in supply/demand and therefore this event will have been "priced in". These fundamental catalysts are easiest to "price in".

The second type of catalyst is a one-time flow catalyst. An example of this would be Crypto Asset B has a lock up approaching where a certain portion of holders will be able to sell their tokens for the first time. Traders can then make assumptions and determine that if  $\$X$  unlocks on that day and  $Y\%$  of holders will sell than there is likely to be  $X*Y = \$Z$  sold around the unlock. These traders can then go and sell  $\$Z$  and buy it back after the event happens. This will effectively “price in” the event ahead of time as the actual flow when the event occurs will be neutral since you will have the unlocked investors selling  $\$Z$  and the traders buying  $\$Z$ . In practice generally the traders sell a bit less than  $\$Z$  and these types of catalysts are normally *partially* priced in. Lastly, there are structural flow catalysts. Like one time flow catalysts these directly impact supply/demand dynamics however they do so in a structural fashion. Bitcoin halving events are a good example of structural flow catalysts.

**Bitcoin halving events are known for many years before they actually occur, yet they always seem to have a meaningful impact on price action. This is because structural flow catalysts are nearly impossible to price in.** In the case of Bitcoin’s next halving event for example, structural supply will be reduced by  $\sim \$15\text{mm}/\text{day}$  at current levels. In order to price this in, market participants would need to buy  $\sim \$15\text{mm}$  of Bitcoin every single day between now and the halving event and then after it occurred sell back the  $\sim 15\text{mm}$  of Bitcoin every day after the event. Even this would only price it in for so long, as eventually the traders would have sold everything they bought, and that future effect would then no longer be priced in. However, no market participants actually do this, and therefore structural flow catalysts do not start to be priced in until very close to the events and even then, are never fully priced in. Ethereum’s transition to PoS will be the largest structural flow catalyst in the history of crypto.

**What about Bitcoin’s halving events? Don’t they also reduce structural supply?**

Yes, as discussed above they do reduce structural supply and they are bullish. However, the way that Bitcoin halving events work they will never completely erase Bitcoin’s structural supply issues. Generally, the events lead to step function gains in Bitcoin’s price action which is what gave rise to the popular stock-to-flow model for Bitcoin. However, once price resets, the structural flow becomes the same as before as denominated in fiat. For this reason, Bitcoin will never really be able to lift the cap on its price the way Ethereum will. Furthermore, as Bitcoin does not have structural

demand due to very low fee revenue it will likely never be a structural demand asset. Lastly, Bitcoin's halving events are driven purely by a reduction in issuance without a shift to a more efficient consensus mechanism, therefore while they reduce issuance, they also reduce security which is a detriment to fundamentals and raises several unanswered long-term questions. Bitcoin is head and shoulders above every other crypto asset when it comes to decentralization and this has significant value but at the end of the day crypto assets are driven by supply and demand and this will likely always remain an issue for Bitcoin.

### **If structural demand is so significant why did 1559 not have an even bigger impact on ETH prices?**

While EIP-1559 *did* result in significant price appreciation for ETH, I do not think the structural demand change as fully reflected as one might have expected. Before 1559 users were still buying back the ETH they spent on transactions. This is not where the change occurred. Instead, the change occurred in terms of where the fees were going. Before 1559 all transaction fees went to miners who you may have assumed were selling those fees back into the market and after 1559 a portion of fees are now burned and do not find their way back into the market. You would have expected then that 1559 would result in a significant reduction of daily sell pressure. However, while miners do sell a portion of issuance as we have discussed above, these *additional* fees were all falling through to their bottom line as their selling from issuance was already offsetting all of their expenses. In this context, they were likely only selling a smaller portion of the additional fee rewards that they received.

To summarize, while miners now receive a lower aggregate number of daily tokens, they are also likely selling a greater portion of these tokens which likely offset a large portion of the structural impact you would have theorized 1559 would have had on the price of ETH. For this reason, I think 1559's greater impact was laying the foundation for the impact the merge will have rather than its independent direct impact.

### **There are already many other PoS assets, why are you not more bullish on them too?**

There are many other successful PoS assets, and many have done extremely well. I hold several of them and think many other assets besides Ethereum will also succeed. With that said, most other PoS assets lack the fee revenue to become structural demand

assets and importantly are *already* PoS which makes them less attractive over the medium-term vs an asset that is transitioning to PoS. In this context, ETH's set-up over the next six months is unparalleled and, in my opinion, it is not particularly close. I believe ETH offers a significantly better risk adjusted return over the next 6 months than all other L1's.

### Why is PoS so much more efficient than PoW?

To understand why PoS is more efficient than PoW first we need to understand how either mechanism provides security. The purpose of the consensus mechanism is to validate transactions and provide protection against a 51% attack. The efficiency of a consensus mechanism can be measured by the issuance required to generate a unit amount of security. In other words, how many dollars the network has to pay out to receive \$1 of protection from a 51% attack. For PoW, the cost of a 51% attack is primarily the hardware required to obtain 51% of the hashrate. So it comes down to how much money miners require to invest \$1 in mining hardware. Given that mining hardware only lasts a couple years and miners generally demand a healthy profit margin, generally it works out to 100% return on investment in the first year. This means that to buy \$1 of mining hardware miners require \$1 of issuance. They can then use this hardware for 2 years and turn a profit. In this context, the network needs to issue \$1 of supply each year to generate \$1 of security. In reality the efficiency is actually worse than this as this doesn't account for utility costs which also push efficiency down.

In the case of PoS stakers are not required to purchase hardware, so the question becomes what return do stakers demand to lock up their stake in the PoS consensus mechanism. Once locked these stakes act as protection against a 51% attack as an attacker would need to purchase enough stake to represent 51% of the total. In general, stakers require ~10% (maybe lower over time but we can assume 10% to be conservative) return to lock their assets in PoS. This means that to gain \$1 of security a PoS needs to issue \$0.10 of issuance. This 10x more efficient than the PoW mechanism and actually contains several conservative assumptions so in reality it is actually greater than 10x more efficient. To conclude, this means that a PoS network can issue 1/10th the issuance of a PoW network and be just as secure. In the case of ETH they will

actually issue about 1/3rd the issuance and the network will be 3x as secure as it was during PoW.

[1] The only other large assets that arguably have structural demand is BNB. I believe its structural demand is the primary reason it has been able to maintain its position as the 3rd largest asset despite a significant negative narrative and lack of growth. It trades at 2x the Market Cap/Revenue multiple of ETH despite what are in my opinion significantly worse secular fundamentals. To me this very fact is a large proof point in favor of the impact structural demand can have on price action.

Ethereum

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