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Martin Gaspar, Research Analyst
martin.gaspar@crosstower.com

DeFi on Binance Smart Chain vs. Ethereum

BSC Has Seen Usage and TVL Jump

Cost-conscious Retail Users are Likely Choosing BSC Over Ethereum

DeFi projects on Ethereum have attracted so many users over the last year that gas fees on Ethereum have risen to levels that many consider exorbitant. Consequently, this has pushed users to seek alternative, cheaper platforms that allow them to participate in DeFi. One of such is Binance Smart Chain (BSC), which has seen total value locked (TVL) and user growth soar in recent months. In this report, we examine the key differences between BSC and Ethereum and highlight the DeFi ecosystems on each. Moreover, with growth favoring BSC, we discuss whether this is at Ethereum's expense.

Highlights

- **BSC sees rapid growth as users seek Ethereum alternatives.** In recent months, crypto users have flocked in droves to BSC, seeking its cheaper fees and faster block times. Because BSC is smart contract and EVM compatible, many of the most popular Ethereum dapps have been copied over to BSC. Consequently, BSC has seen unique addresses, a proxy for users, soar from under 1 million in Q4 2020 to nearly 65 million as of April 13, 2021. BSC TVL stood at nearly \$34 billion as of the same date, according to Defistation, while 7-day daily active users totaled approximately 435,000, according to data from BscScan, underscoring the growing popularity of BSC.
- **Ethereum TVL continues to gain, despite sustained high gas fees.** TVL on Ethereum increased from approximately \$16 billion at the end of Q4 2020 to nearly \$47 billion at the end of Q1 2021, according to DeFi Pulse. As of April 14, 2021, TVL stood at approximately \$57 billion. Notably the increase in TVL is not only from crypto price appreciation – the number of ETH locked in DeFi hit an all-time high in early April 2021. This TVL growth suggests there is still robust demand for DeFi on Ethereum regardless of its expensive gas fees.
- **DeFi on both BSC and Ethereum to benefit from hunt for yield.** In our view, the DeFi ecosystems on both BSC and Ethereum are poised to continue to grow, driven by the hunt for yield above that available in traditional finance, although we anticipate BSC to see most of this growth. We expect BSC to draw more retail users, while Ethereum will draw less cost-conscious investors who seek a more robust ecosystem.
- **What could tilt momentum back towards Ethereum?** We anticipate the launch of popular Ethereum DeFi platforms on layer 2 solutions (L2s), which typically provide lower fees and faster transactions, to prompt BSC users to return to Ethereum's broader product suite. Aave and dydx are examples of some of popular Ethereum DeFi platforms that have already launched on L2s successfully. While their activity on L2s currently is a fraction of that on Ethereum mainnet, we expect to this to pick up as users seek out the efficiency of speed and lower costs.

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Binance Smart Chain (BSC)

BSC was launched in September 2020 by crypto exchange Binance. It is a blockchain that supports smart contracts. BSC is Ethereum Virtual Machine (EVM) compatible, which means it supports many of the decentralized applications (dapps) and tools on Ethereum, including decentralized exchanges (DEXEs).

It offers 3 second block times via Proof-of-Stake (PoS). This compares to 15 second blocks on Ethereum, which currently uses Proof-of-Work (mining), although it is transitioning to PoS. Given its centralized nature versus Ethereum, BSC offers considerably greater throughput and speed than Ethereum.

BSC is similar to Ethereum in that Binance Coin (BNB) is used to pay for transaction/gas fees on the network, just like ETH is used to pay for fees on Ethereum.

A key consideration with BSC is its centralized structure versus Ethereum. BSC has 21 active validators (parties that stake BNB to validate transactions). Staking effectively means depositing or locking up the token, in this case BNB. By limiting its validator set, the network is able to process transactions much more quickly and cheaply.

Since many of the validators on BSC are closely tied to Binance, or are thought to even be run by Binance, there could in theory be censorship of transactions. Specifically, one concern is that Binance could pressure validators to censor, or blacklist, transactions from specific addresses. Alternatively, the validators themselves could choose to do so on their own. Hence the small number of validators is not ideal, in our view. We prefer Ethereum in its current state, with mining power largely distributed. In its PoS state, Ethereum had over 118,000 validators as of April 13, 2021, and is poised to be a much more decentralized network upon fully transitioning to PoS, when compared to BSC, with its 21 validators.

Moreover, it is our understanding Binance controls on and off ramps to BSC. In a worst-case scenario, we believe regulators could be able to force Binance to restrict movement of assets tied to residents of certain countries. Regardless of these considerations, users have flocked to BSC for its lower fees and transaction times relative to Ethereum.

Centralization Warning

On March 4, 2021, a BSC-based DeFi protocol, Meerkat Finance, allegedly performed an exit scam, taking off with the \$32 million of crypto deposited onto the protocol, just a day after it launched. When this occurred, Binance disabled its Binance bridge, according to media reports, likely to prevent the funds from spreading outside its blockchain. The Binance bridge allows users to transfer funds from BSC to other blockchains, including Ethereum. Binance effectively restricted the movement of funds for all users through its action. While a developer tied to the Meerkat Finance team announced a couple days later they would be returning user funds. As these events unfolded, many Twitter discussions suggested Binance CEO Changpeng Zhao played a role in pressuring the Meerkat team to return the funds.

This event underscores our concern that Binance has the ability to control the on and off ramps into its ecosystem and potentially restrict the movement of user funds. Consequently, it is difficult for us to see how investors would be comfortable with depositing

large amounts of capital onto BSC instead of Ethereum. Instead, we see BSC as being retail-driven.

Binance Chain and BSC Token Standards

While most crypto users will be familiar with the ERC-20 token standard on Ethereum, they may not know some of the token standards used on Binance Chain and BSC, two separate blockchains created by Binance.

BEP2 – Binance Chain token standard

BEP8 – Mini-BEP2 Tokens on Binance Chain (require less BNB to launch, tailored for smaller projects)

BEP20 – BSC token standard

The Allure of BSC

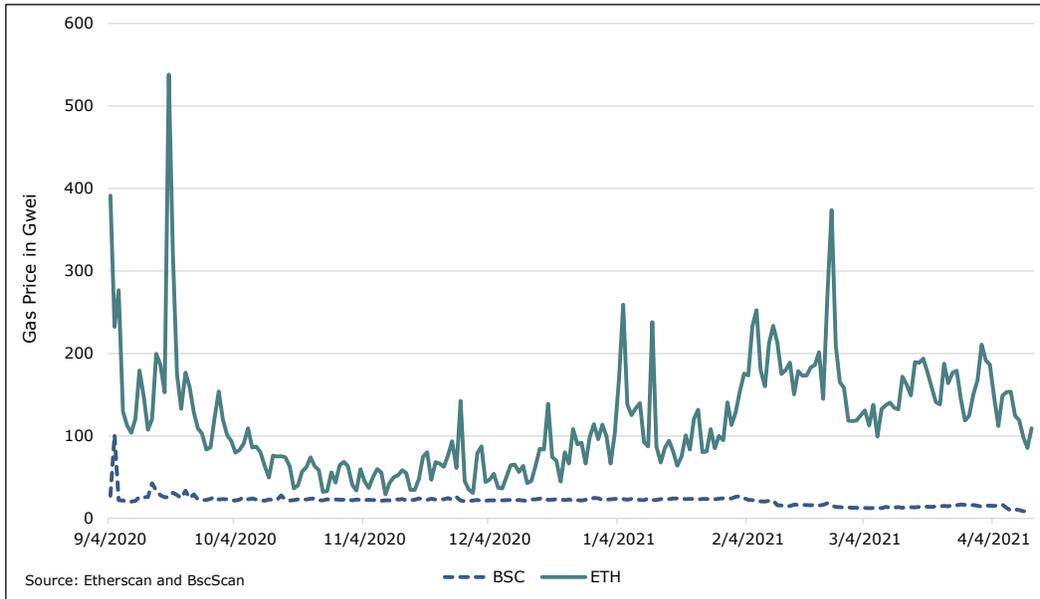
We believe the rapid growth in users, value transacted, and TVL on BSC is from several factors. One of these is the movement of cost-conscious users from Ethereum to BSC. These users have enjoyed DeFi on Ethereum but eventually became priced out as gas fees remained high. BSC allows users to have a similar DeFi experience, but for just a fraction of the transaction fees. For example, swapping assets on PancakeSwap on April 14, 2021 cost the equivalent of approximately \$0.30 in transaction fees. On Uniswap, a swap would have cost around \$33.00 (gas price 107 gwei) according to GasNow's interaction calculator. The savings are evident here.

Another reason people find BSC attractive is because of the relatively high yields found there versus Ethereum DeFi. Yields on the most popular DeFi platforms on Ethereum have fallen across the board from record levels in the summer as liquidity mining programs expired or were slimmed down. As many of the DeFi platforms on BSC have just launched, liquidity mining rewards are in full swing. Yields here are further boosted by the appreciation of the tokens yield farmers receive for providing liquidity. This has come in a period where much of Ethereum on DeFi has been stuck in a holding pattern or seen minimal gains, in our view.

Gas Prices on BSC and Ethereum

According to Exhibit 1 below, the ETH gas price is much greater and fluctuates more than that of BSC. One of the reasons that the BSC gas price is so flat and consistent is because the BSC community voted in February to lower the gas prices from 15 gwei to 10 gwei due to the rising price of BNB. This instance again demonstrates the power of Binance and the Binance community over the protocol – they were able to lower the gas fees amid limited resistance from the validators over the lost income.

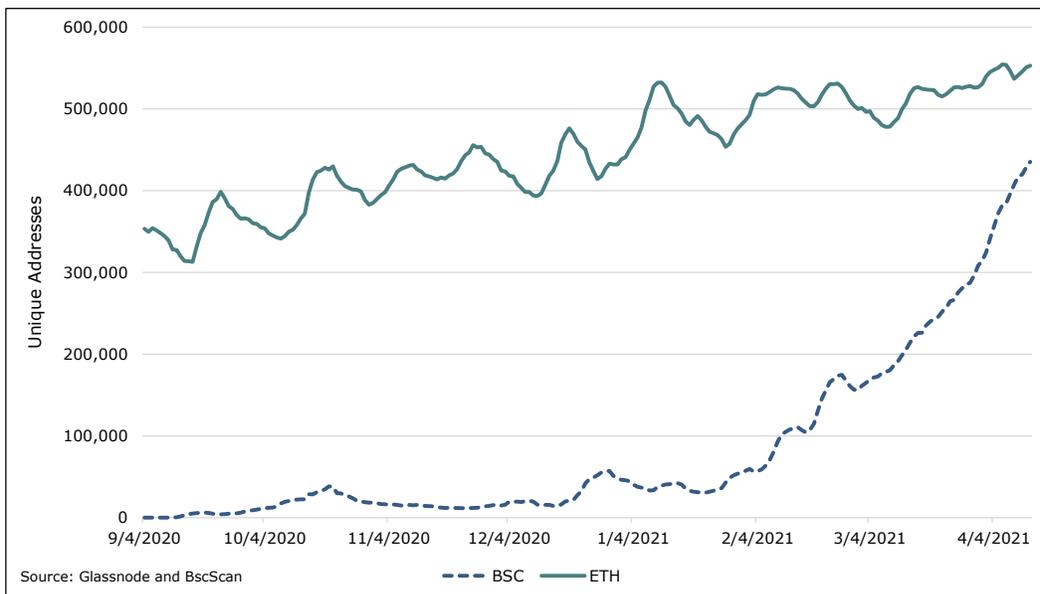
Exhibit 1. BSC and Ethereum Gas Prices



Yet, by sacrificing decentralization for a slightly more centralized chain with Binance controlling some aspects of the BNB and BSC networks, BSC is able to offer these ultra-low fees that can attract a lot of users and developers to their DeFi space. As the lower fees are among the most attractive features of BSC compared to Ethereum, it will be interesting to see how the April 15, 2021 Berlin hard fork and the implementation of EIP-1559, expected summer 2021, will affect Ethereum's own fees.

BSC Users Now Rival That of Ethereum

Exhibit 2. 7D Average Unique Active Addresses on BSC and ETH.

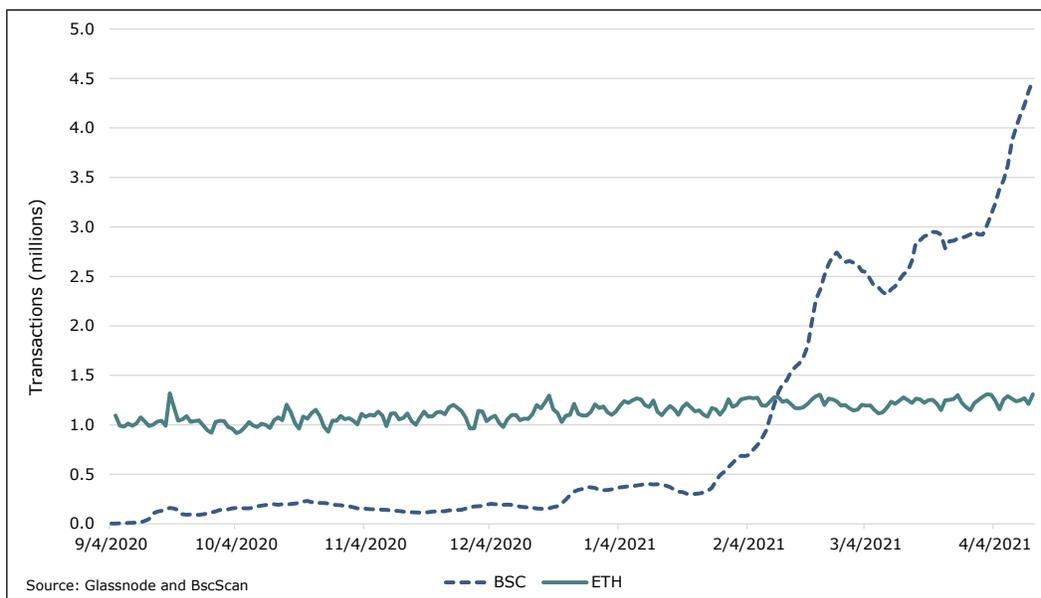


BSC has seen impressive growth since launching when considering its unique active addresses, a proxy for users. Since its September 2020 launch, BSC's unique active addresses have soared to rival that of Ethereum. As of April 13, 2021, its 7D average unique active addresses totaled approximately 435,000, according to data from blockchain explorer BscScan, which compares to Ethereum's 553,000. Much of the user growth for BSC came in Q1 2021, which in our view was driven by renewed user interest in cheaper access to DeFi as well as the launch of more DeFi platforms on BSC during the quarter.

Transactions on BSC Exceed That of Ethereum

BSC reached an inflection point in February 2021, with its 7D average transactions on its network surpassing that of Ethereum for the first time. Given there are still less unique daily active addresses (users) of BSC, the greater transactions suggest BSC users are transacting more frequently than Ethereum users are. We believe this is because of the difference in costs to transact on each network. Since BSC gas fees are substantially cheap relative to Ethereum, we believe users are emboldened to make more transactions or smart contract interactions.

Exhibit 3. 7D Average of Transactions on BSC and ETH.

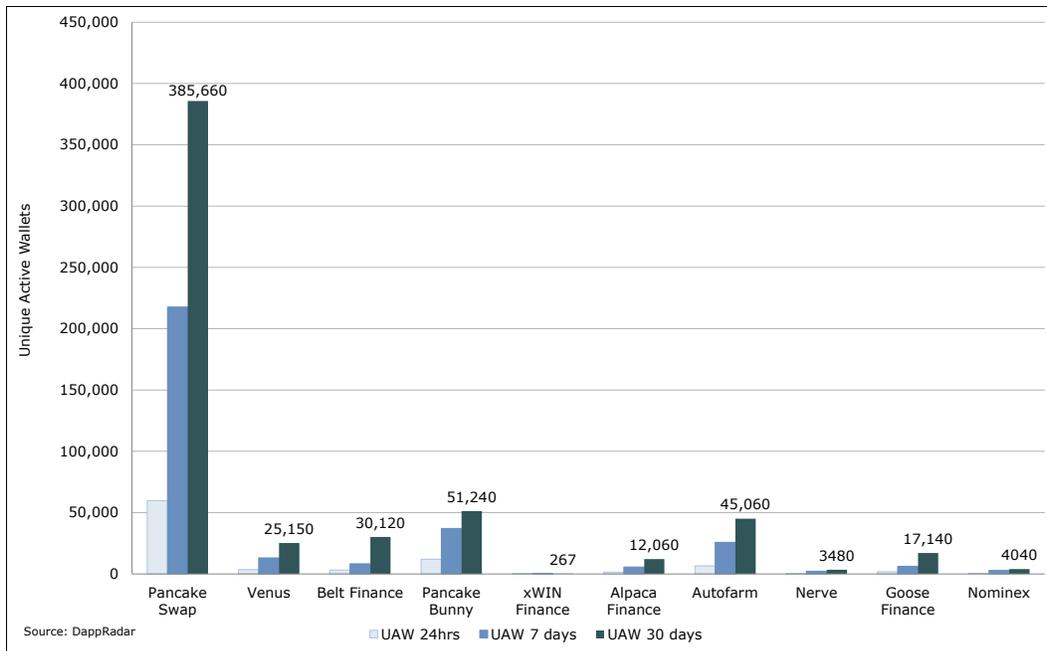


Another factor to consider is network utilization. Exhibit 3 shows that the 7-day average of transactions on Ethereum was roughly flat since September 2020 (when BSC launched). This is because the network utilization is at capacity due to sustained strong demand for DeFi, with the ensuing fight for block space leading to the kind of gas fees many complain about today. Consequently, there are only so many transactions that can occur on the network, explaining the plateau in Ethereum transactions over time. In fact, Ethereum network utilization has hovered around 98% to 99% in recent months, according to data from Etherscan. BSC network utilization averaged approximately 48% for April 2021 through April 13, indicating it still has ample room to accommodate further user and transaction growth.

Most Popular BSC Dapps

To understand how users are utilizing BSC, we analyzed data from DappRadar, a decentralized application intelligence provider. Exhibit 4 shows DeFi protocols PancakeSwap, Pancake Bunny, and Autofarm had some of the most unique active wallets (UAW) over the last 30 days as of April 14, 2021.

Exhibit 4. Unique Active Wallets on BSC



In our view, these user figures are impressive and underscore our thesis that crypto participants are trying BSC primarily to use DeFi applications. Relative to Ethereum dapp UAW, it is notable that BSC projects are attracting so much attention when many are relatively new.

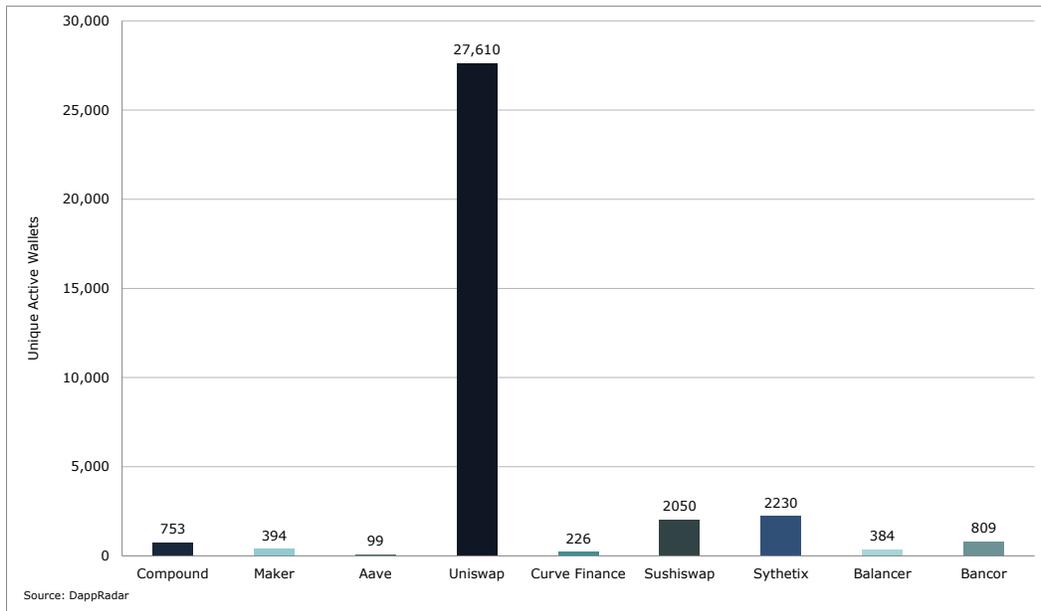
Active Ethereum DeFi Users Are Less Than TVL Suggests

According to data from DappRadar, 24hr UAW as of April 14, 2021 on leading Ethereum DeFi protocols may be lower than their billions of dollars of TVL would suggest. In exhibit 5 below, we sorted the protocols by TVL, as calculated by DeFi Pulse.

The data shows that although money market protocols Compound, Maker, and Aave together comprise nearly 50% of TVL on Ethereum, they represented only a small fraction of users for the period. In our view, this could be to many users depositing long-term liquidity as well as the reluctance of some users to take out loans because of high gas fees.

The Ethereum DeFi protocols with the most users for the period were DEXEs, with over 27,000 UAW interacting with Uniswap. To us, this indicates that there remains strong demand for swaps even in a high gas fee environment.

Exhibit 5. Ethereum DeFi Protocol 24hr UAW as of April 14, 2021

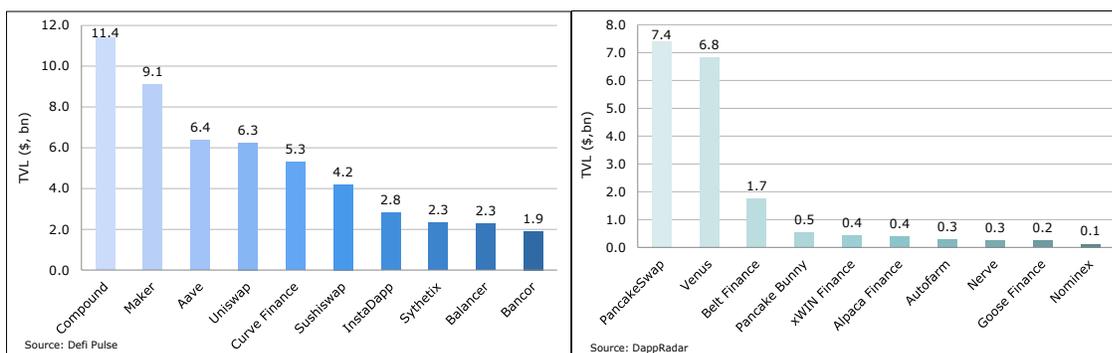


In comparison to BSC UAW for the same 24hr period, popular Ethereum protocols had roughly one third of the amount of users as the top BSC protocols did. Notably, PancakeSwap had nearly 60,000 users over this period, roughly double what Uniswap had. So while Ethereum still has more TVL than BSC, clearly BSC is winning when it comes to total active users.

BSC vs. ETH DeFi TVL

Total value locked (TVL), a measure of the amount of cryptocurrency users have deposited into dapps or smart contracts, has been increasing for both ETH and BSC in 2021, although BSC has seen faster growth. As of April 14, 2021, BSC TVL stood at approximately \$34 billion, according to Defistation which compared to Ethereum’s roughly \$57 billion TVL, as measured by Defi Pulse.

Exhibit 6. Ethereum DeFi protocol TVL (Left) and BSC DeFi protocol TVL (Right)



Some BSC protocols are seeing levels of deposits similar to that of Ethereum's most popular protocols. PancakeSwap, with \$7.4 billion of TVL as of April 14, 2021, actually had more TVL than its Ethereum counterpart Uniswap (\$6.3 billion). Venus, a money market protocol on BSC, also had an impressive \$6.8 billion, although less than Maker (\$9.1 billion), the protocol it is modeled on. We note on a protocol level, we used data from Defi Pulse for Ethereum TVL data and data from DappRadar for BSC TVL, so the figures may not be calculated using the same method. Regardless, the trend here is clear – BSC has been able to attract significant capital in a relatively short amount of time. However, BSC TVL is primarily concentrated in two protocols (PancakeSwap and Venus), so it remains to be seen if any other protocols will gain significant traction, as they have on Ethereum, which has several DeFi protocols sporting TVL of over \$1.0 billion.

We also note that TVL is just a one measure of a protocol's success. High TVL on a protocol may be due to a liquidity mining program they are running, so TVL may not be an apples-to-apples comparison across protocols.

BSC and Ethereum Outlook

According to the data available, we believe it is possible BSC overtakes Ethereum in many key areas such as TVL, users, and transactions in Q2 2021. We believe both will see growth however, as investors continue to stretch for yields above that of traditional finance. Until Ethereum is able to solve its high gas fees through the adoption of L2s and other solutions (EIP-1559), we think many retail users will prefer to use BSC over Ethereum. However, we do not believe the popularity of the rise of BSC is necessarily at Ethereum's expense. Ethereum has a more robust ecosystem, with many of its dapps and tools not present on BSC. Moreover, its decentralized structure appeals to professional investors who understand the risks of centralization.

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