

Personal Ethereum Mining Revenue Compared to Reported Average

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Abstract

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Ethereum (ETH) mining revenue is nothing new, yet still a practice new to so many. Blockchain technology is the protocol of ETH's network operability and a passion that I participate in through ETH mining (Proof of Work). Revenue analysis of personal mining operations compared to the reported network average would reveal whether my machine outperformed the network in revenue relative to megahash. This study inspects the relationship between personal ETH mining revenue in US dollars and reported average mining revenue in US dollars.

ETH is a cryptocurrency, currently operating under a Proof of Work (PoW) mechanism. PoW is a decentralized consensus protocol, in which miners: do the work, provide proof of their work, and act as directors of validation within the ETH ecosystem. ETH miners provide a "certificate of legitimacy" for transactions, balances, and market order.

Anyone is capable of mining with a computer, internet connection, electricity, and money for graphic processing units (GPUs). Users can use this capacity for revenue to create profits through proper management of hashrate, electric rate, and power consumption.

Hashrate is primarily dependent on hardware used. Hashrate defines the miner's rate of performance, the higher the more revenue. A specific hashrate may earn less as more miners come online, and new components outdo prior models. This change is termed an 'increase in network difficulty', in turn reducing mining revenue.

Electricity is a priority when computing profitability, but disappears when it comes to revenue. It's possible to earn revenue without profit, if the electric bill is larger than ETH payouts, you are paying more than you are earning. It's important to compute electric rate and consumption when considering profit. The present study is concerned with revenue, not profitability, so electric consumption will not be taken into account.

Many operating systems allow ETH mining, including Windows. While other operating systems are designed specifically for Proof of Work, like Hive OS. Miners are rewarded through participation, if a new block is solved/ created, two ETH are minted to the miner. Due to intense difficulty to participate in the worldwide network as a solo miner, most miners opt towards joining a mining pool (group mining). Countless pools exist, as well as payment methods to distribute among participating miners. Before having a pool to mine with mining software is required. Various options are widespread furthering decentralization in the network including Phoenix Miner, NBMiner, and GMiner.

Understanding the relationship between individual ETH mining revenue compared to the reported average ETH mining revenue can help answer personal questions and concerns regarding minings value. For example, how average revenue trends relate to personal profits relative to hashrate, discover inefficient mining practices, and develop a deeper understanding of ETH mining difficulty to profitability. To fulfill the performance of a full-time miner, one must truly become a full-time miner. Meaning not taking away mining time from the machines. As a college student extraneous variables enter the situation making providing that of a full-time miner becomes distant. I hypothesize personal ETH miner revenue will perform lower overall in comparison to reported average ETH mining revenue.

METHODS

Materials

Around 170 megahash is reached by the personal ETH miner. Which consists of 4 GPU's: 2x Nvidia GeoForce RTX 2080 8gb, and 2x Nvidia Geforce RTX 3060Ti LHR. Internet access is gained through a wired connection into a wireless router extender. The miner uses Hive OS to operationalize the machine, Nbminer as the miner, and Ethermine for the pool.

Hive OS is a computer operating system optimized for mining of cryptocurrencies. Nbminer, one of many miners, provides extra efficiency for LHR cards making it an understandable miner option. Ethermine, the mining pool within this study, offers a PPLNS

payout scheme, “Pay-Per-Last-N-Shares”. When a block is found the reward of each miner is calculated based on the participation to the last number of pool shares. Ethermine provides instant payouts as soon as the threshold of 0.005 ETH is met.

BitInfoChart aggregates a historical chart of ETH’s mining profitability in USD per day for one megahash. Multiple timelines are available with daily data points from 3-months to 3-years to even all-time (7/30/15).

Procedure

15 weeks of personal mining revenue was gathered from November 28th, 2021 (Week 48, 2021) to March 18, 2022 (Week 12, 2022) with a mining rig averaging 170 megahash through Ethermine. Data was grouped weekly Sunday-Saturday, with the United States Dollar (USD) price of 1 ETH listed for the corresponding week. Revenue in ETH was multiplied with the price of 1 ETH each week to create a weekly estimate of personal miner revenue in USD.

Reported average daily mining revenue collected on BitInfoChart was transformed into weekly revenue averages in USD per 1 megahash. To create an estimate of reported average mining revenue in USD relative to the hashrate output of the personal miner, weekly avg USD per 1 megahash was multiplied with 170.

Results

A paired samples t-test conducted with SPSS on personal mining revenue in USD ($M = 46.51$, $SD = 16.81$, $N = 16$) and reported average revenue in USD ($M = 58.23$, $SD = 15.12$, $N = 16$) revealed a significant difference of revenue; $t(15) = 6.1$, $p = .001$. Results fail to reject the hypothesis, personal ETH miner revenue will perform lower overall in comparison to reported average ETH mining revenue. Proving the personal miner is under performing based on the average reported revenue.

Visual analysis depicts clear discrepancies each week in ETH mining revenue between personal and reported rates. The initial revenue found in the first week, week 49 2021, is the closest the two values are throughout the whole study, a 0.58 cent difference. The line chart

displays the downward trend of ETH mining revenue over the course of the study. Based on visual analysis, revenue is lower and drops are more significant in personal mining than in the reported average.

Discussion

Findings revealed the expected hypothesis to be true, personal mining operations would perform lower in revenue compared to the reported average mining revenue. Revenue from

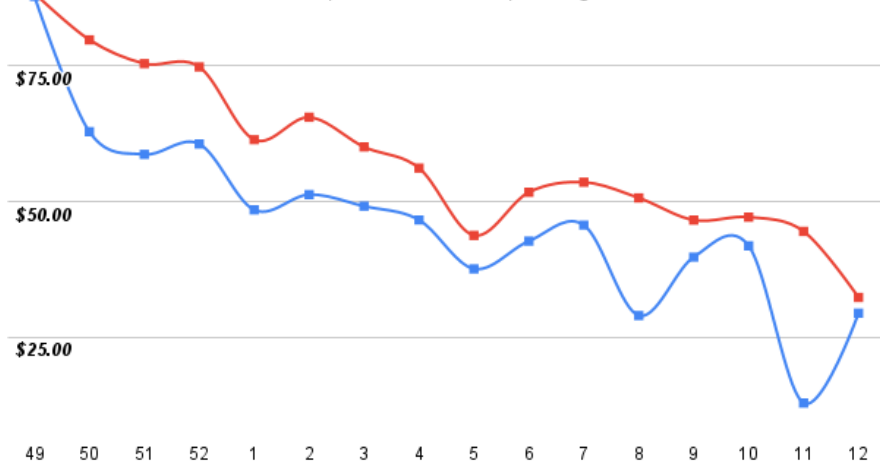
mining is multifactorial, hardware could crash, electricity could be cut off, or internet connection could be lost.

Lower revenue in personal mining can be linked to an unstable mining operation. Hive

OS, the operating system used for my miner is known to randomly crash forcing a mandatory physical reset. Which could leave the miner not working for hours, increasing down-time rather than ETH. Additional crashes occur when rebooting the wifi router to clear cache and speed connection. This happens often and randomly, forfeiting away a lot of potential participation. Since the personal miner is also a workstation it's necessary to turn off the miner when there's tasks to complete. Graphic designing, video editing, report writing, and researching take precedence over mining ETH. Additionally, playing video games for a couple hours a week takes away from operational mining time. Low overclock settings may have influenced the decrease in revenue as well. These settings are set low for safety and longevity, which may negatively affect returns. Crypto's volatility could have played a big role, if the personal miner

ETH Miner Revenue Line Chart

■ CalculatedEthMinedtoUSD ■ ExpectedUSDbasedonreportedavg



amassed a large amount of down time while the market was booming, a lot of potential revenue could have been lost.

Cryptocurrency mining revenue is hot in the media and in the rooms they operate. Many will go to the greatest extent to receive maximum revenue. In the comparison of my personal miner revenue and the reported ETH revenue rate, the distinction is made clear of all those who maximize their ability to reap revenue mining ETH and those who don't.