

Research on Market Fluctuation Caused by Ethereum Hard Fork

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Abstract

Ethereum has been widely concerned since its inception and is currently the most widely used common development platform. Ethereum has had several network technical upgrades in the development process. It is now in the first phase of the “Metropolis” in the Ethereum development roadmap, and will soon enter the second phase of “Metropolis” – “Constantinople”. A few days ago, Ethereum announced that a block height of 7,080,000 was chosen as the hard fork time point of "Constantinople".

Since each stage of technology upgrade will have certain fluctuation effects on the market, in this report, we will conduct an analysis on historical Ethereum hard forks to investigate the price fluctuations caused by the technical upgrades of Ethereum.

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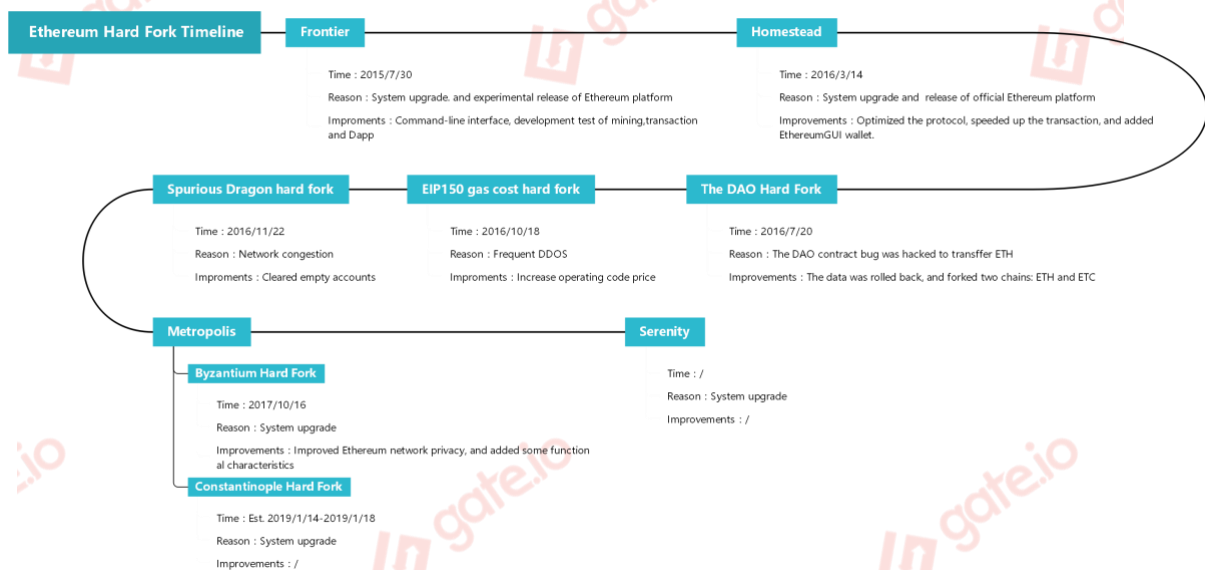
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1. Introduction of Ethereum Hard Fork History

1.1 Historical Development Roadmap of Ethereum Hard Fork

According to the original Ethereum development plan, there are four stages of the technology upgrade roadmap, including Frontier, Homestead, Metropolis, and Serenity. In the development process, due to some unexpected problems, such as solving and resisting the system network attacks and other problems, so there were another three unplanned hard forks, namely the DAO hard fork, EIP150 gas cost hard fork, and Spurious Dragon hard fork.

Ethereum Hard Fork Timeline



1.2 Details of ETH Hard Forks in History

Frontier 2015/7/30			
Reason	The first experimental release of Ethereum	Goal	To set up effective network
Improvements	1. Added command-line interface; 2. Developers can conduct mining, trading and DAPP development testing.		
Homestead 2016/3/14 (Fork Completed at 12 : 22)			
Reason	Ethereum network upgrade	Goal	The first stable version
Improvements	1. Block difficulty change 2. Added new operating code 3. Some network adjustments		
The DAO Hard Fork 2016/7/20 (Fork completed at 11 : 37)			
Reason	The DAO contract bug was hacked to transfer ETH	Goal	Recapture stolen funds
Improvements	1. Modified the code, the data was rolled back to the height of the block before the stolen 2. Forked a new main chain, and the miners who did not accept the change will continue to mine in the original chain, forming two chains: ETH and ETC.		
EIP150 gas cost hard fork 2016/10/18 (20:00-21:00)			
Reason	Frequent DDOS	Goal	Relieve junk mail attack
Improvements	Increased the price of the operating code that is too low.		
Spurious Dragon hard fork 2016/11/22 (23:00-24:00)			
Reason	Network congestion	Goal	Speed up the online transaction
Improvements	Clear the Ethereum network empty account created by the attackers		
Byzantium Hard Fork 2017/10/16 (20:00-21:00)			Metropolis

Reason	Ethereum network system upgrade	Goal	Solve privacy issues
Improvements	<ol style="list-style-type: none"> 1. Implemented anonymous transactions 2. Reduced development difficulty 3. Predictable gas price 4. Allowed ZK-Snarks and other encrypted mathematic™ 5. Delay the difficulty timebomb 6. Transaction status receipts 7. Smart contract upgrades 		
Constantinople Hard Fork Est. 2019/1/14-2019/1/18			
Reason	Ethereum network system upgrade	Goal	Make the Ethereum network lighter, faster and safer
Improvements	<ol style="list-style-type: none"> 1. Delay the difficulty timebomb for 18 months 2. Reduce mining rewards 3. Support OTC trading 4. Support complex contracts and optimize commissions 		
Serenity To be determined			
Reason	Ethereum network system upgrade	Goal	Become a true mainstream blockchain
Improvements	Adopt PoS and implement Casper		
Transition from POW to POS finally: solving the problem of mining centralization caused by POW			

2. Price Trend Diagram of ETH Hard Forks

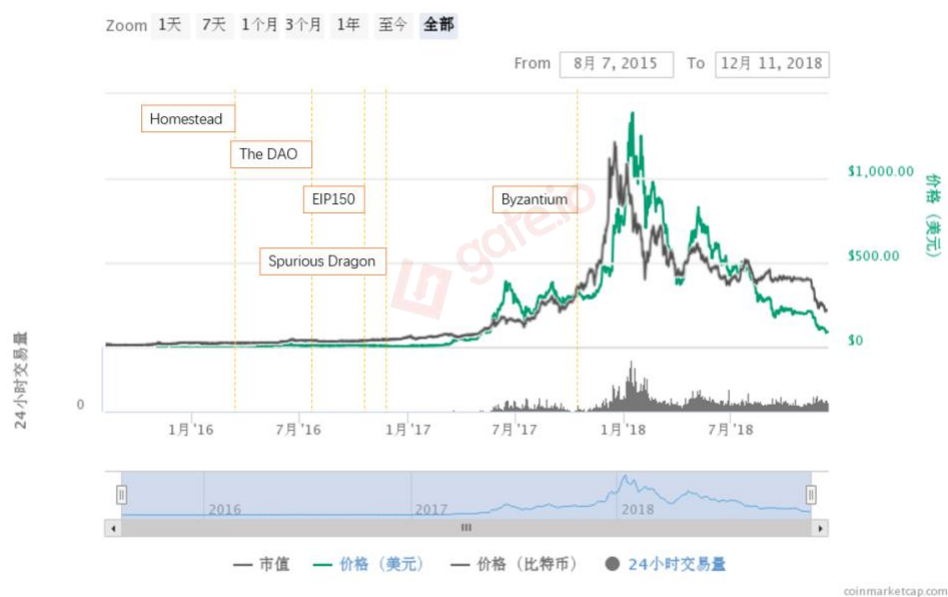
Notice: The price diagram below is based on the industry impact of Ethereum hard fork and coin price before and after the hard fork. The policy factors at the time, the subjective factors, the market factors and other uncontrollable conditions are not

considered.

2.1 The Price Trend Diagram of Historical Ethereum Hard Forks

The chart below shows the Ethereum price trend of each hard fork in history. So far, there have been five hard forks. Every time of Ethereum technical upgrade is highly concerned by the public, causing wildly fluctuation of the market. Based on these problems, we will select the time buckets for previous hard forks and analyze and summarize the Ethereum price.

Ethereum 图表



Source : Coinmarketcap.com

2.2 The Price Trend from Frontier to Homestead

2.2.1 Events Timeline from Frontier to Homestead

Time	Events
Nov. 2015	DEVCON-1 took place.
Late 2015	Microsoft announced the launch of the Ethereum-based Azure cloud computing platform.
Jan. 2016	Ethereum smart contract opened the way to blockchain application.
Jan. 20, 2016	The People's Bank of China held a digital currency seminar, which initially presented China's recognition of the value of blockchain and digital currency, which brought significant benefits to the blockchain industry.
<p>Hard fork is generally considered to be a risk event that can destroy the value, but some forks can also create value. Ethereum's Homestead hard fork was an upgrade of Ethereum network, which optimized the Ethereum network and positively promote the increase of coin price.</p>	

2.2.2 The Price Trend from Frontier to Homestead

Ethereum 图表



Source : Coinmarketcap.com

Since the Frontier released in July of 2015, Ethereumereum has not received the immediate feedback effect of the market. However, since the release of Frontier, not until the early stage of Homestead release, Ethereum’s technology has begun to be widely recognized. Before the Homestead hard fork, Ethereum price began to increase gradually. The price declined slightly after the Homestead technical upgrade, which is a normal ups and downs in the market.

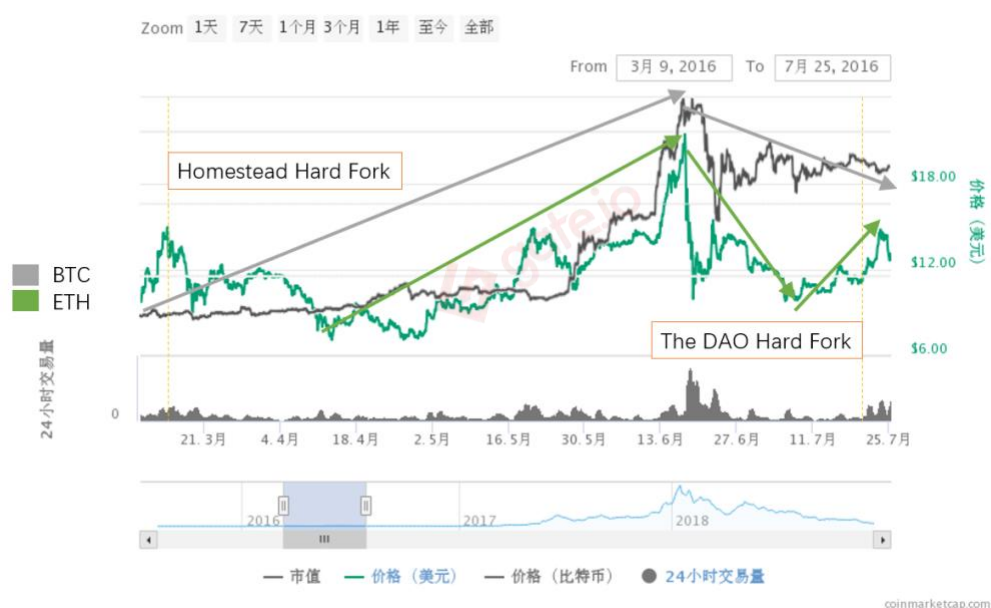
2.3 The Price Trend of The DAO Hard Fork

2.3.1 The DAO Events Timeline

Time	Events
2016/04/29 -/2016/05/27	The Ethereum-based project “The Dao” started crowdsale, and raised over 150 million USD, making it one of the largest crowdfunding projects in history.
2016/06	The DAO was hacked and 50 million USD in ETH was stolen by attacker. As The DAO is a Ethereum smart contract, Ethereum price dramatically dropped after the hack.
2016/06/17	Vitalik Buterin proposed the soution of “hard fork”.
2016/06/19	The hacker launched the attack again, and a small amount of DAO assets were separated.
2016/07/08	Tickets Website for DEVCON 2 was online.
2016/07/20	Hard fork implemented.

2.3.2 The Price Trend of the DAO Hard Fork

Ethereum 图表



Source : Coinmarketcap.com

After Homestead hard fork, there was a period of downward trend of Ethereum price.

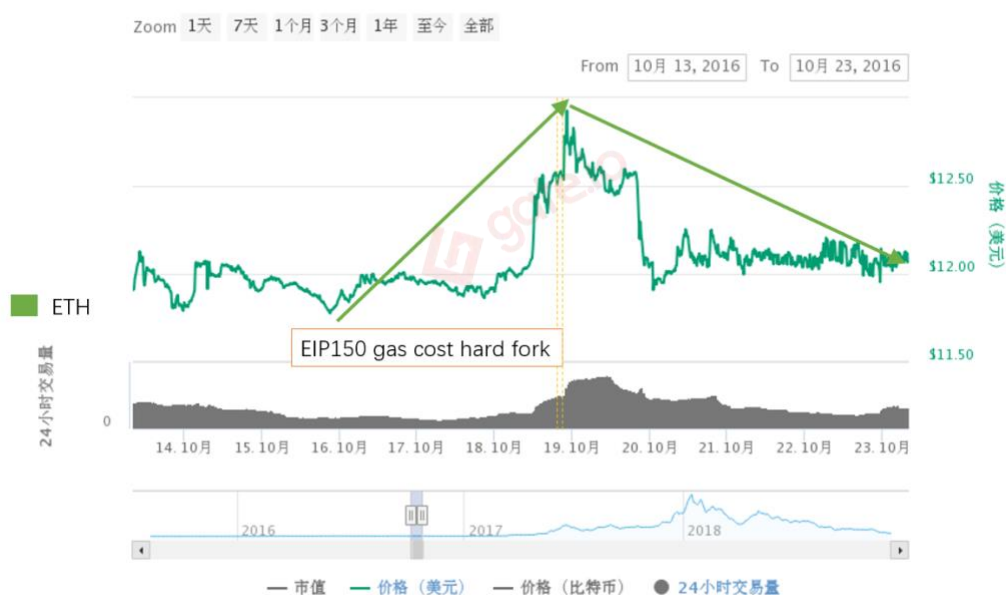
This is the price correction phenomenon, which is normal for the market transaction.

From Homestead to the DAO, the success of Ethereum has brought the new technology and business ideas to the industry. Moreover, during the same period, several projects began to raise funds and issue tokens on Ethereum, which had a positive impact on the entire market at that time. Therefore, the price trend of Ethereum and BTC began to converge.

However, the DAO incident in June of 2016 has caused instability in the market, reflecting that Ethereum had a certain impact on the market. When the founder of Ethereum revealed the implementation of hard fork on July 16, ETH price began to rise significantly, until the fork was completed, that is, on July 20, the Ethereum price had begun to return to normal.

2.4 The Price Trend of EIP 150 Gas Cost Hard Fork

Ethereum 图表



Source : Coinmarketcap.com

The above chart shows the detailed price trend of Ethereum before and after EIP150 hard fork. After the height of the forked block is announced, the price shows a rising trend until reaching the peak when the fork is completed, and then there is a price

correction period.

2.5 The Price Trend of Spurious Dragon Hard Fork



Source : Coinmarketcap.com

As shown in the above chart, when Ethereum announced the Spurious Dragon hard fork time on November 18, 2016, it had little impact on the market at that time. Until few days before the hard fork, it had begun to have a further impact on the market. After the mainnet upgrade, there is a short period of price correction.

2.6 The Price Trend of Byzantium Hard For

2.6.1 Byzantium Hard Fork Events Timeline

Time	Events
2017/10/11	Release Byzantium hard fork announcement.
2017/10/14	Announced the completion of wallet security and Byzantium EVM DoS bugs.
2017/10/15	Re-release the Byzantine hard fork announcement.

2.6.2 The Price Trend of Byzantium Hard Fork

Ethereum 图表



Source : Coinmarketcap.com

Byzantium Hard Fork was implemented on October 16, 2017. It can be seen from the above chart that the market was instable before the hard fork, but the overall price

showed an upward trend until the fork completed. Then it went to a price correction stage after the hard fork

3. The Overall Price Change Before and After the Hard Fork

ETH Hard Fork	Time	Price at the time of fork	Change (7d) before the fork	Change (7d) after the fork	Change (30d) before the fork	Change (30d) after the fork
Frontier	2015/7/30	/	/	/	/	/
Homestead	2016/3/14 (12: 22 completed)	\$13.17	22.74%	-18.68%	136.45%	-46.17%
The DAO Hard Fork	2016/7/20 (11: 37 completed)	\$11.67	10.20%	5.14%	-5.96%	-7.80%
EIP150 gas cost hard fork	2016/10/18 (20:00-21:00)	\$12.24	0.82%	-5.39%	-4.60%	-17.32%
Spurious Dragon hard fork	2016/11/22 (23:00-24:00)	\$9.96	-2.83%	-18.37%	-16.79%	-23.39%
Byzantium Hard Fork	2017/10/16 (20:00-21:00)	\$340.36	11.76%	-16.76%	40.86%	-1.34%

According to the above chart, in the week before the hard forks of Homestead, the DAO, and Byzantium, the Ethereum price change was high. Since these three forks were significant technical upgrades for Ethereum itself, they therefore had a greater impact on the market.

The other two hard forks (EIP150 gas cost hard fork and Spurious Dragon hard fork) were minor modifications to specific technical issues, so there were little impact on the market.

Notice:

- 1) Because the data during the Frontier stage was not recorded by Coinmarketcap, so

we are unable to analyze in this report.

- 2) The price change was calculated by comparing the prices on the day of the hard fork.
- 3) Since fork time was announced in different time, the data is collected one week before and after the fork.

4. Conclusion

In the initial stage of Ethereum release, the official team has released the development roadmap of Ethereum, which indicated that the transition between the stages is achieved by hard forks. It is concluded from the above information that the market fluctuations caused by different Ethereum hard forks are relatively similar.

Whether the planned hard forks or the unplanned hard forks to solve sudden system problems indicate that Ethereum is developing in a better direction. The positive hard fork usually causes a certain degree of price rise. However, it is hardly to determine whether the market price is falling back before the fork or after it. In general, the Ethereum hard fork will cause dramatic fluctuations as “^” shape in the market.

Based on the market performance after Ethereum hard fork in history, the impact of hard fork on the market can be divided into three phases:

Phase 1: Within a certain period before Ethereum hard fork, the price shows upward trends in different level, and even has positive impact on the market. This reflects people's attitude towards the prospects of Ethereum's technical improvement after the hard fork, and finally shows the overall expectation of bullishness of the market.

Phase 2: Before and after the Ethereum hard fork time point, the Ethereum price presents a peak period shortly. The price change during this period shows the feature of uncertainty. Meanwhile, this stage is also the inspection period of the market for hard forks, and reflects the characteristics of the attitude's change of the market before and after hard forks.

Phase 3: After the inspection period, the price of Ethereum has shown a price correction in different level, which reflects the characteristics of the market to restore rationality after a cooling-off period.

5. References

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Statements

The following statements were made based on the research report:

1. This report is a conclusion drawn by gate.io research team through investigation and analysis. It aims to summarize the characteristics of the market price fluctuation of Ethereum's historical hard forks, and cannot completely predict the price impact of subsequent hard forks.
2. This report does not measure the value of the research object itself and the issued token value, and does not constitute the basis for investors to make final investment decisions.
3. The project data cited in this report is from an internal channel that is considered to be reliable and accurate. Due to the existence of human or mechanical errors, the information is subject to the obtained time. Gate.io research team members have verified the authenticity, accuracy, completeness and promptness of the relevant materials in this report, but do not make any express or implied warranty and representation.