The Changing Nature of Cryptocurrencies: Bitcoin and Its Copies During Their Cloning

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- In recent years, cryptocurrencies aroused the interest of researchers.
- Due to more or less popular updates, the duplication of a cryptocurrency can happen. This is a hard fork. Over the last 3 years, it happened at least 3 times to the most famous cryptocurrency : Bitcoin.
- The goal of this paper is to estimate the impact of hard forks on the price level of concerned cryptocurrencies.

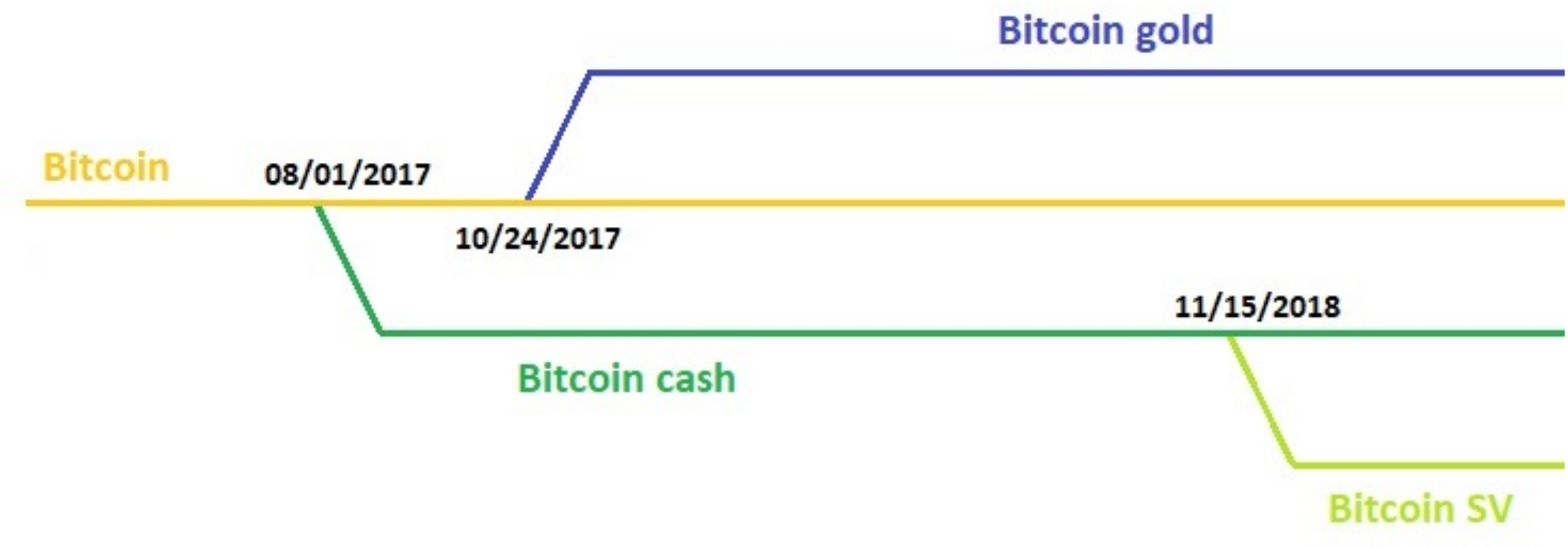

Figure: Appearances of the versions of Bitcoin

- A hard fork is likely to happen again.
- Test relatively large number of periods.
- Update literature results.

- Hypothesis 1: captured attention
  The attractiveness of cryptocurrency gave stable results in literature.
  - Kristouphek (2013), Ciaian et al (2016), Mai et al (2018) and Liu and Tsyvinski (2018) tested it succesfully.
  - Aalborg et al. (2018) find that this could explain the volatility of its price rather than its price directly.
- Hypothesis 2: financial markets
  - Jareño et al. (2020) and Selmi et al (2018) found that Bitcoin could be a safe heaven value or a diversification asset.
  - Stavroyiannis and Babalos (2017) and Baur et al. (2017) find no evidence of safe haven value.

- Hypothesis 3: economic reasoning
  A reasoning from Barro (1979) leads to the following equation

$$P_{b,t} = \frac{k(\pi)P_t y_t}{M_{b,t}} \tag{1}$$

  where $P_{b,t}$ is the price of a cryptocurrency, $k(\pi)$ a decreasing function of the current interest rate π, P_t the price level of the economy, y_t the quantity of goods exchanged for cryptocurrency and $M_{b,t}$ is the money .supply
- Ciaian et al. (2016), Ciaian et al. (2018), Wang and Vergne (2017), Biais et al. (2018) unsuccessfully tested comparable approaches.

- Hypothesis 4: competitive analysis
  New hypothesis in the literature:
  Since the very existence of the studied cryptocurrencies stems from a conflict, are they competitors ? Or are they substitutes because they are all similar assets ?

Periods are delimited by

- taking into account the hard fork dates
- using two algorithms designed by Cho and Fryzlewicz (2014) and Cho (2016).

In order to robustly attribute the changes to the hard forks, a diff-in-diff approach is implemented. At each period, the changes in Ethereum's are also observed. It has been chosen as a control cryptocurrency because :

- It already existed in 2016.
- Its functioning is comparable to Bitcoin (PoW).
- Its importance in the global market of cryptocurrencies has remained relatively stable over time (second market capitalization).

For simplicity and for lack of stationarity, I use the simplest model: linear regression on the daily return in dollar of each cryptocurrency:

$$Return_t = \ln(P_{b,t}) - \ln(P_{b,t-1}) \tag{2}$$

The model is turned into GARCH model with regressors when it is appropriate.

Hypothesis	Proxy	Source
Attention	Wikipedia views Reddit new subscribers	Wikipedia API subredditstats/redditmetrics
Financial markets	SP500, VIX, SX5E, VSTOXX, FSTE, VFTSE NIKKEI, JNIV, USD ex.r.	Bloomberg, Euronext Nikkei
Economic	Number of active addresses Number of transactions Money supply Interest rate	coinmetrics US treasory

	SBS algo.	DCBS algo.
BTC	16/05/2017	16/05/2017
BCH	08/11/2017 13/03/2018	08/11/2017 13/03/2018
BTG	03/12/2017 20/02/2018	20/02/2018
BSV	07/05/2019 22/07/2019	07/05/2019 22/07/2019

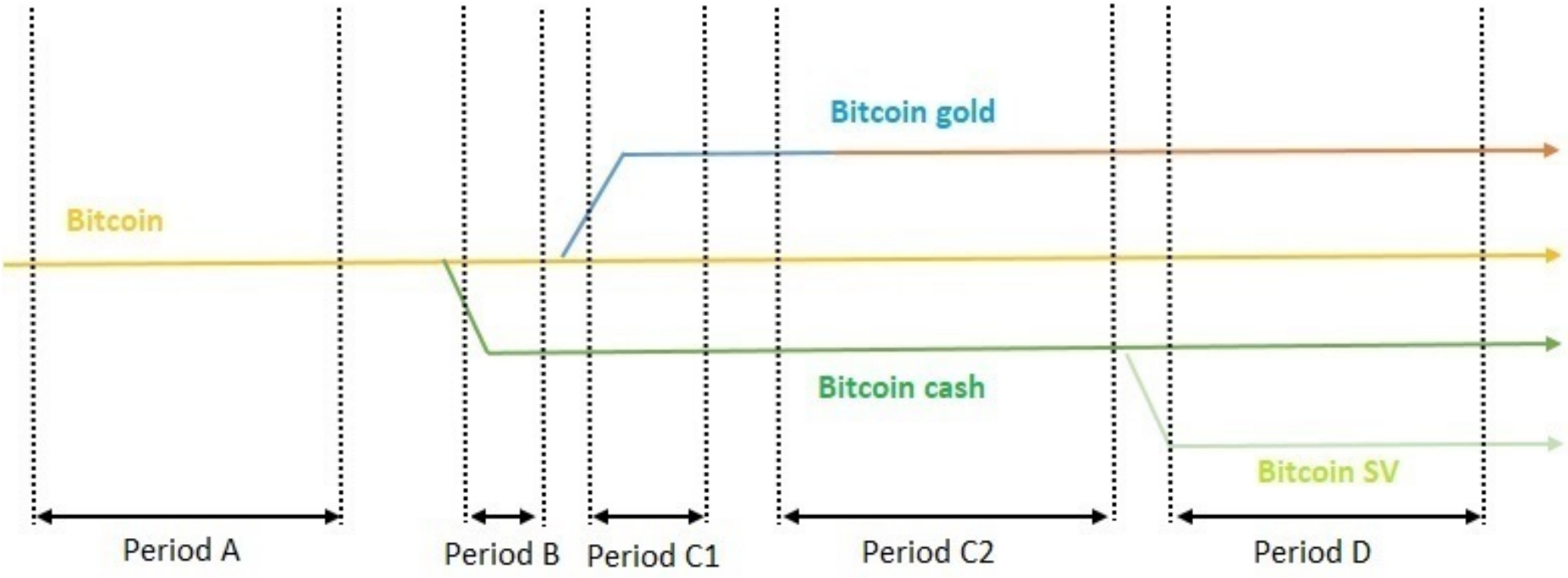

Figure:

Figure: Segmentation

Attention hypothesis

	ETH	BTC	BCH	BTG
1.	*DWiki*(285) *DReddit*(15) 8%	NS	X	X
2.	NS	*DWiki*(5,000) 1%	NS	X
3A.	*DReddit*(100) 20%	*DWikim*(32,000) 11.5%	*DWiki*(2600) 17.5%	*DWikim*(60) *DReddit*(1.5) 13%
3B.	NS	NS	*Wiki*(4300) 3%	*DWiki*(50) *DReddit*(50) 3%
4.	NS	NS	NS	NS

Attention hypothesis

Period	BCH	BTG
3B.	*SX5E* (1.1) 1%	NS
4.	USD-GBP ex. rate (-1.5) *FTSE* (2) 1%	USD-GBP ex. rate (-1.9) 3%

Economic hypothesis

	BTC	BCH	BTG	BSV
1.	NS	X	X	X
2.	NS	NS	X	X
3A.	IR 1 year (2) 5 to 10%	*inflation*(8) *transactions*(0.15) 25% to 30%	*transactions*(0.15) 10%	X
3B.	IR 1 year(0.4) 2%	inflation (4.5) addresses (0.05) IR 1 month(0.65) 5%	NS	X
4.	NS	inflation(15) addresses(0.04) 4%	addresses (0.4) transactions (0.4) 2%	NS

	BTC	BCH	BTG	BSV
2.	$BCH(0.13)$ 5%	$BTC(0.87)$ 7%	X	X
3A.	NS	$BTG(0.4)$ 35%	$BCH(0.8)$ 30%	X
3B.	$BCH(0.4)$ $BTG(0.44)$ 65%	$BTC(1.4)$ $BTG(0.8)$ 67%	$BTC(1.4)$ $BCH(0.8)$ 65%	X
4.	$BCH(0.38)$ $BTG(0.56)$ $BSV(0.38)$ 67% with BCH 67% BTG 40% BSV	$BTC(1.7)$ $BTG(1.2)$ $BSV(0.88)$ 67% with BTC 57% BTG 40% BSV	$BTC(1.2)$ $BCH(0.5)$ $BSV(0.6)$ 67% with BTC 57% BCH 34% BSV	$BTC(1.1)$ $BCH(0.47)$ $BTG(0.7)$ 35% to 45%

Period	Attention	Economic	Competitive
Ethereum, period 0	$Reddit(0.001)$ $Reddit_{-2}(-0.0007)$	$inflation(-0.7)$ $address(0.18)$ $transactions(0.18)$	X
$Adj.\ R^2$	7%	5%	
Ethereum, period 1	$DWiki0.02$ $Reddit(0.0008)$ $Reddit_{-1}(-0.0005)$ $Reddit_{-2}(-0.0002)$	NS	$ETC(0.23)$
$Adj.\ R^2$	13%		11%
Ethereum Classic period 1	$Wiki(0.0003)$ $Wiki_{-1}(-0.0002)$ $Reddit(0.004)$ $Reddit_{-1}(-0.003)$	$transactions(0.05)$	$ETH(0.4)$
$Adj.\ R^2$	4% with *Wiki* 9% with *Reddit*	1%	17%

Results show the nature of cryptocurrencies has changed regularly in recent years, but these changes cannot be attributed to hard forks.

The economic approach has little success, meanwhile financial markets never have an impact on the cryptocurrencies's price. This suggest it can serve as a diversifier rather than a currency.

In addition, rivals cryptocurrencies seem to be substitutes, even if there can be a conflict period to cross during which they are decorated uncorrelated.