

Token supply increase event study

Objective: To assess whether cryptocurrency tokens exhibit a pattern in price movement when there is a sudden jump in the circulating supply.

Dataset

The top 30 coins by market cap were calculated for each month from 2019 to 2021. Within this group, coins that had sudden jumps in their liquid supply curve were selected. In this report the results of Avalanche were reported. Price data for a period of 21 days either side of the step was selected to assess the effect at varying intervals.

The log returns of the assets were calculated using daily open and close prices. A market-cap weighted benchmark of Bitcoin (BTC), Ethereum (ETH), Monero (XMR), Litecoin (LTC), Ripple (XRP) and Dogecoin (DOGE) was used as a reference to calculate risk-adjusted coefficients α and β . The 3-month US treasury bill rate was used as the risk-free rate.

Background

The abnormal return of a firm, or in this case cryptocurrency token, i at time t relative to the market m can be expressed as shown in *equation 1*.

$$AR_{i,t} = R_{i,t} - (\alpha_i + \beta_i R_{m,t}) \quad (1)$$

Coefficients α and β are calculated from an OLS market model that regresses the selected token returns $R_{i,t}$ onto the market's returns $R_{m,t}$, with α representing the excess return of the token and β representing the sensitivity of the token to changes in the market. From the abnormal return on each day the Cumulative Abnormal Return was calculated for each window period across the range shown in *equation 2*.

$$CAR(t_1, t_2) = \sum_{t=t_1}^{t_2} AR_{i,t} \quad (2)$$

Results

The weighting of the market benchmark index was first calculated for the entire duration of Avalanche's dataset, shown below in *table 1*, as well as the daily log return.

Table 1. Market capitalisation weighted index of cryptocurrency benchmark

Date	Index Component Weight						Return
	BTC	ETH	XMR	LTC	XRP	DOGE	
23/9/20	79.7%	15.1%	0.6%	1.2%	3.1%	0.1%	-3.59%
...							
16/9/21	62.4%	28.9%	0.3%	0.9%	3.0%	2.2%	-1.12%

The daily log return of the benchmark was then regressed against the daily log return of Avalanche using Ordinary Least Squares, as shown in *figure 1*.

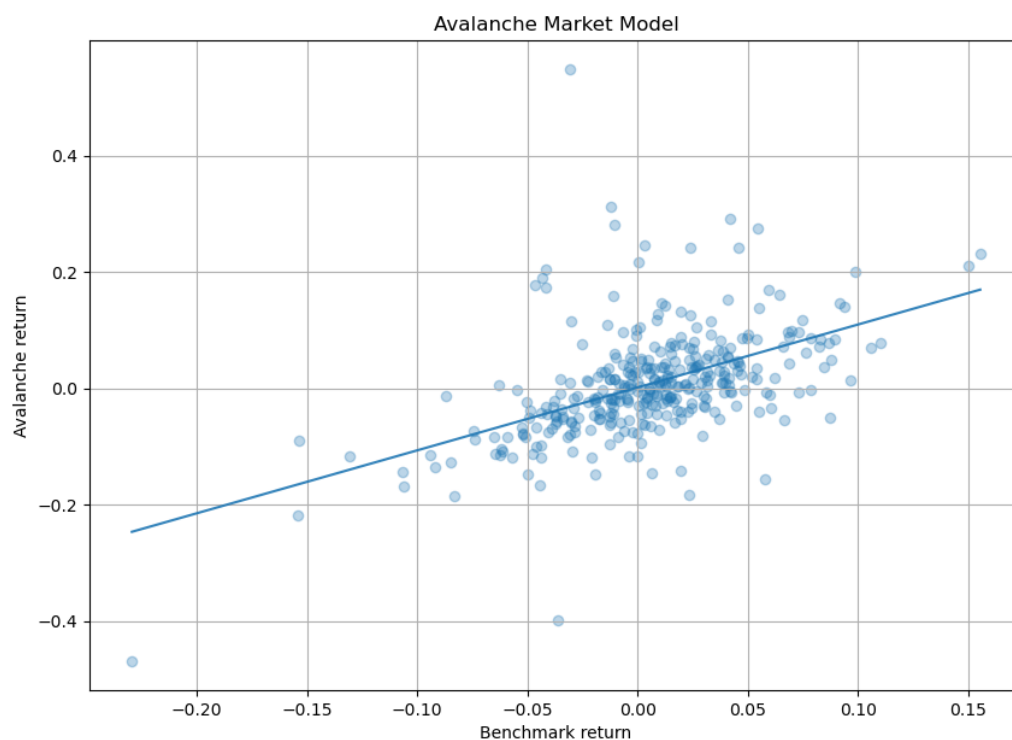


Figure 1. OLS regression of Avalanche against benchmark index returns

This produced an α of 0.002 and β of 1.082 for Avalanche between 23rd September 2020 and 16th September 2021.

Four dates were identified as sudden jumps in supply for Avalanche between September 2020 and September 2021 shown in *appendix A*.

For each of these dates the Cumulative Abnormal Returns (CAR) was calculated 21 days either side of the supply jump with $t=0$ as a boundary. This means at window index -20, the CAR was measured between 20 days prior to the event and the event itself.

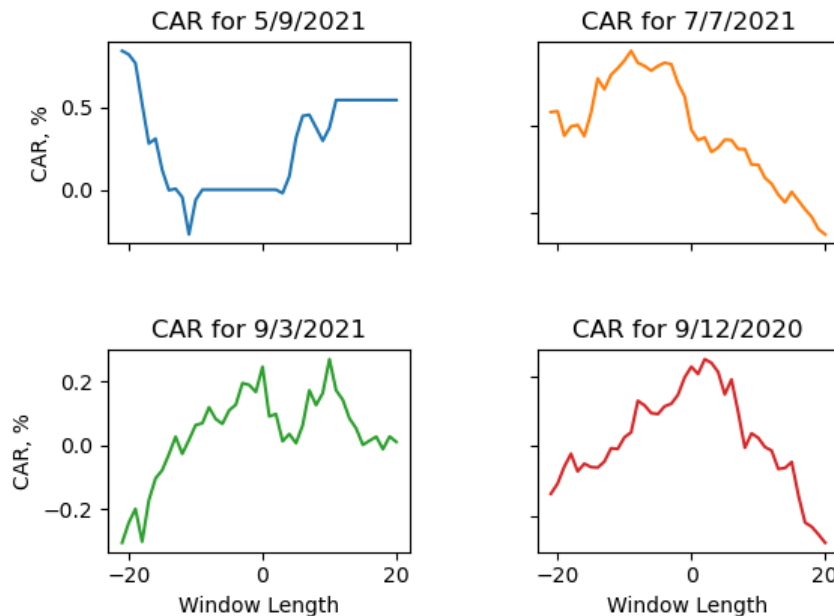


Figure 2. Cumulative Abnormal Returns for sudden jumps in Avalanche circulating supply

As can be seen in *figure 2* after the supply jumps in July 2021 and December 2020 there was an underperformance relative to the market for the weeks following the supply jump. The supply jump in March 2021 saw gains in line or better than the market and in September 2021 there was a significant outperformance of the market following. In all but September 2021 there was an outperformance of Avalanche relative to the market in the lead up to the event.

It must be noted that the July 2021 event, in which the hypothesis was proven correct, occurred during a market downturn and thus may be explained by external market factors. This was not the case for December 2020 giving confidence to the hypothesis, but the study sample should be expanded before a conclusion can be made.

Limitations & Future improvements

The calculation of the weighted benchmark ignores free float, skewing the actual dominance of each coin by the amount held in lost or dormant wallets and potentially biasing the market coefficients of the study. To better understand the significance of the supply factor on abnormal returns it would be preferential to look at other market sentiment factors such as news sentiment and the performance of other assets such as equities over the same period. As also mentioned before, a wider sample of inflationary coins must be studied before a conclusion on the event price pattern can be made.

Appendix A – Avalanche return against circulating supply at key dates for changes in supply

