



QUARTERLY REPORT

"The True Value of Influence"

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Dear Readers,

Today, access to information in the global digital community is as essential as the provision of electricity was during the industrial revolution. We live through an age of hyper-connectivity on an unimaginable scale, where individuals have infinite, accessible, and constantly evolving opportunities to communicate with one another in a global digital community. The notion of something being impossible to build has been replaced by a matter of time, resulting in the creation of new categories of technology that first disrupted the status quo and now exist side-by-side, as an essential part of it.

The impacts can be seen across all industries. Manufacturing has been revolutionized by connected machines and IOT (Internet of Things). Shipping changed by always-on tracking through RFID (radio frequency identification devices). Medicine and science advanced with AI and super-computing. In the financial sector, technology has paved the way for a host of new platforms that have democratized access to markets and services across banking, payments, and investing. Now, what was once reserved for the super rich is available to anyone with a smart phone.



IOT (Internet of Things)



AI in medicine

This increased level of access has fueled the rise of retail investors. While individual investors are not a new phenomenon, recently, a new generation of market participants, inspired by access to equities, fixed income, and alternative assets, has shown the power of hyper-connectivity and proven its ability to exist as a market-driving force. Individuals now have access to the same quantity and quality of information as institutional investors, along with platforms and communities, to share their theories and discuss the potential impact of their strategies.

As this new breed of market constituents continues to evolve, further questions are being raised over the traditional rules of investing. Many are rethinking fundamental questions of risk management and how it should change in the face of instant access to an always-on community and information—some favoring immediate profits from trading over long-term gains through investing. Others remain conservative, pointing out how the democratization of access to information levels the playing field for all parties involved, large and small, raising the competitive bar for individuals and institutions. Both are empowered to make more informed decisions.

With such a high volume of information available, we've also seen the rise of independent analysts. They use a mix of the available information, data on trends, and semi-professional charting software to create compelling cases for why individual investors should or should not invest in an asset. Many are constantly pouring over various pieces of data, looking for hidden insight that will give them an edge. They look toward a long list of sources and factors ranging from the quality of the assets underlying tech to news articles and everything in between. Their goal is to find trends that will help them predict the future and enable them to invest with a level of certainty. However, the factors that can impact the price of a given asset at a point in time are endless, and without a Delorian and Flux Capacitor, predicting the future is all but impossible.

As a social investing platform, we know how quickly information can spread. A simple question can turn into a conversation thread with thousands of responses. We also regularly see conversation threads discussing information overload and fatigue, and confusion about determining a reputable source of information. Simultaneously, we also see a different set of questions and discussions centered on how to digest data and factor it into their individual strategies. This became especially apparent over the last quarter, where the crypto markets experienced a high level of volatility.

So for this report, we wanted to do something different. With our partners at TheTie, we decided to look back at the previous three months to make some sense of the charts and fluctuating prices. We reviewed the information in two categories of sentiment to show how activity in both impacted the price of crypto assets. In the first section, we offer a how-to on reading market sentiment, with snapshots of a few key moments from the past quarter. In the second section, we look at YouTube influencers and how discussing various crypto assets on their popular shows can impact price. Finally, we analyze how two individuals representing two very different views on crypto had the ability to impact sentiment and move the price of assets with their tweets.

At eToro, as we're playing a major role globally in democratizing access to markets, we also believe we have a responsibility to help educate the investors we're enabling. So our goal is to use our scale and reach to provide access to helpful, educational resources, like the information found in this report. Please, leave a comment on our social media and let us know if you find this useful.

Thank you,

Guy Hirsch - Managing Director, eToro US

Introduction

Influence, sentiment, what do these terms mean and why do they matter to investors. This report is designed to answer these questions and more. The goal is to help people understand core data sets that play an integral role in the decision process of professional investors. It contains a significant amount of detailed information and findings that showcase how several moments and the related sentiment played a role in one of the most highly volatile periods in the crypto asset markets since their inception.

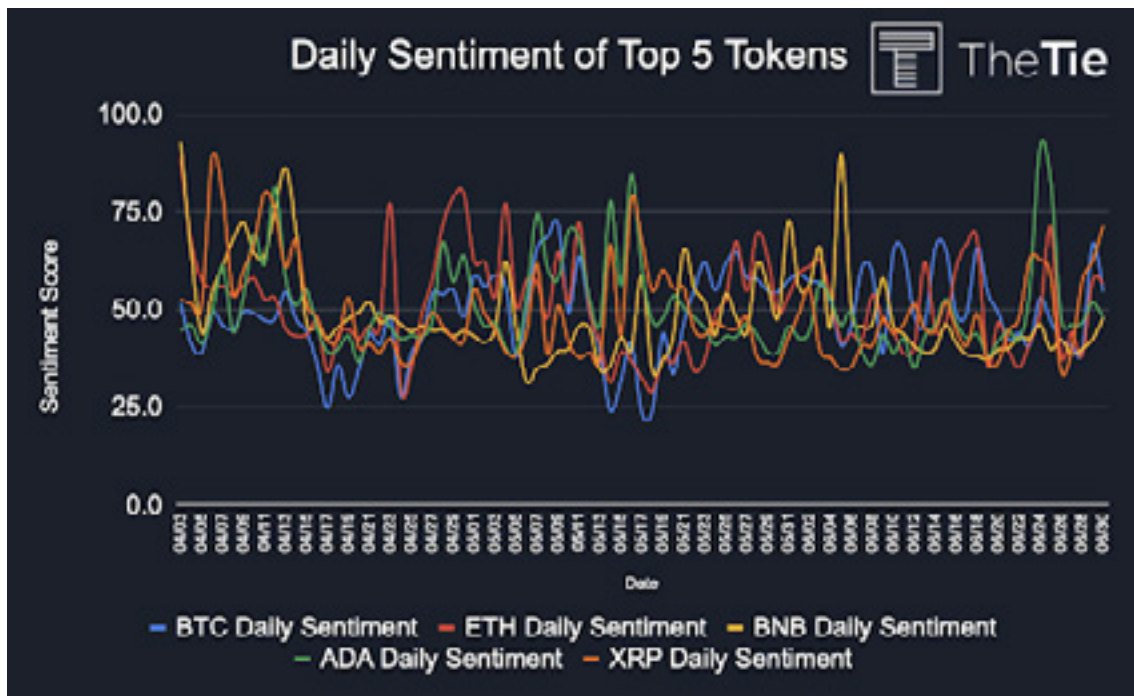
eToro's partner **The TIE** are experts in this area. Every day the firm analyzes billions of social posts and pieces of content across several platforms to track, score, and assess market sentiment. The TIE provided every piece of data contained in the sections that follow. This information aims to help educate investors and provide a basis to determine which sources of insight are reputable and valid.

This tip sheet, created by The Tie sheet, is a helpful resource to enable readers to make sense of the various types of data contained in the report.

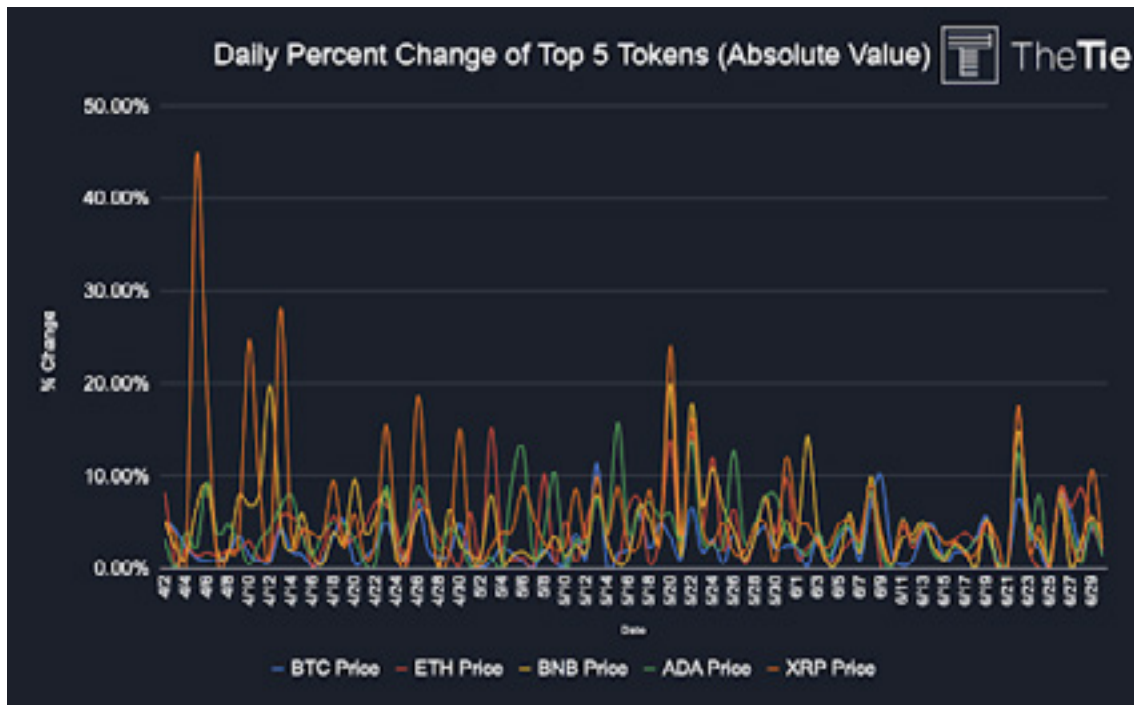
Intro: Sentiment Meets Price Volatility Q2

Q2 2021 was an extremely volatile quarter. Over this time period, the market saw several days with market swings of $\pm 10\%$. As the quarter played out, there were regular spikes in sentiment one to two days before significant price fluctuations. These instances were marketwide.

From a price standpoint, the second quarter of 2021 was the most volatile timeframe for price and sentiment since the crypto winter of 2017. It was driven by sporadic, marketwide price swings of $\pm 10\text{-}20\%$ across most of the top 100 coins in April and May and average daily marketwide swings of $\pm 5\%$ in June. These extreme shifts show that sentiment is an indicator of price movement and demonstrate the importance of why investors should consider daily changes in sentiment and patterns over time as they make investment decisions.



One example occurred on June 6th, when daily sentiment for BNB spiked to a quarterly high of 90, followed by a price spike of roughly 10%.



Not all sentiment is created equal. While it's clear that sentiment is an indicator of crypto asset price, the data should not be looked at in a vacuum. Many events that play out online have roots offline and tend to be part of a multi-faceted situation. Sentiment can show the culmination or continuation of important trends and is a powerful tool. However, before considering sentiment on its own, investors should spend time tracing the outcomes and data it provides and using it to backtrack to the source.

The Bottom Line Influence of YouTube Influencers Overview

YouTube continues to be a growing force in the crypto asset space. Just as influencers are well known to stimulate engagement in the consumer product and fashion industries, popular social media personalities do the same with crypto assets and protocols for both users, traders and investors. This section looks at a series of critical themes and their overall contribution to market sentiment.

It's important to note that several factors determine the price of a crypto asset. While it's very simplistic to assume that if Influencer A talks about crypto asset B that the price increases, there is much more to the story. Instead, overall the data shows that influencers likely play a more significant role in helping to maintain a consistent price after other market factors drove an increase due to the trust and connection they've built with their audiences.

Imperfect Storms

The data in **Figure 1** looks at how a discussion on one of the most popular crypto-YouTube channels came right before the price of the crypto asset increased. **Bitboy Crypto**, which boasts one of the most significant, most engaged audiences, is perhaps one of the few influencers with the power to impact the price of crypto assets. Since the beginning of 2021, views per video grew by 570%, increasing from an average of over 21k views per video to an average 141k per video, the most significant increase by any crypto-YouTuber.

The host, Ben Armstrong, is a highly followed thought-leader among retail investors. While some may look for collusion, he is transparent about which companies sponsor the channel and what capacity. They are displayed on the screen throughout his show. Accordingly, there is more evidence to suggest that his knowledge and analysis led him to conclude that Cosmos was ready to break out. The trust he's built with his audience made many comfortable investing in the crypto asset.

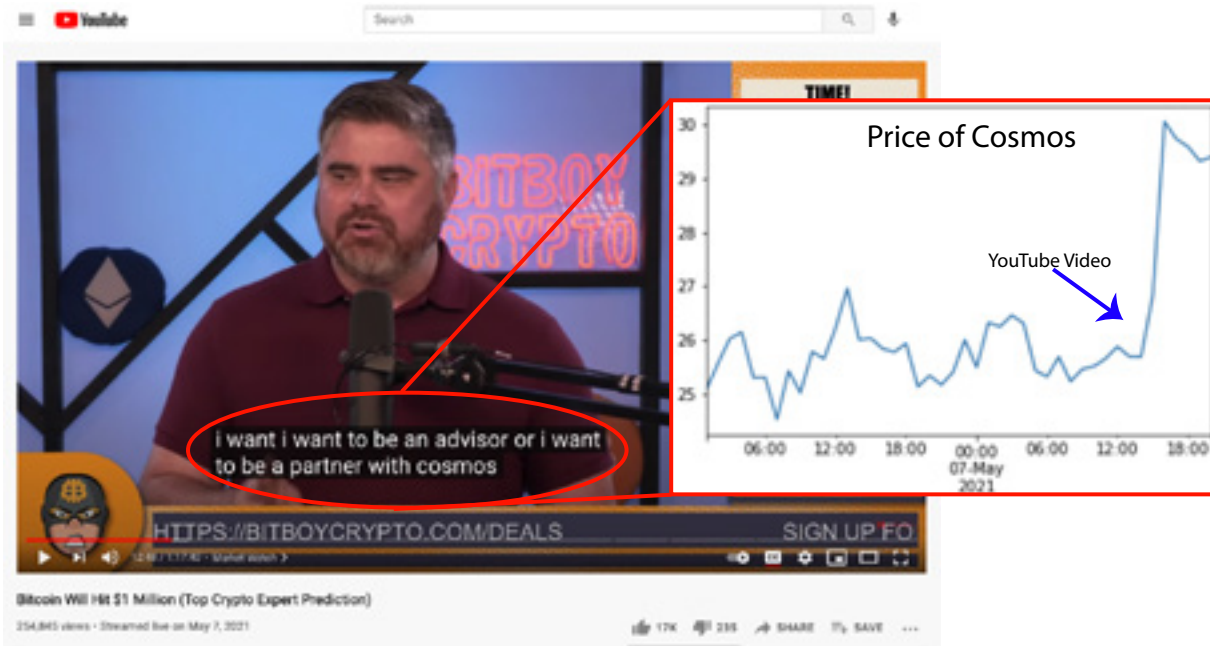


Fig. 1

“Cosmos is a project I want to do a lot more content on. I am ready to start doing content on cosmos. Actually, can we reach out to Cosmos, let’s get Heather to reach out to Cosmos. I want to partner with Cosmos. I want to be an advisor, or I want to partner with Cosmos because I love Cosmos. They don’t get the credit they deserve and I’m ready to push that.”

– Figure 1. Ben “Bitboy Crypto” Armstrong YouTube Livestream February 6, 2021

Armstrong is not afraid to share his opinion for or against price increases, trends, and prominent industry players, which has helped him build one of the largest audiences in the crypto industry. It’s important to note. This commentary is not an endorsement of Bitboy Crypto but rather a review of the facts available.

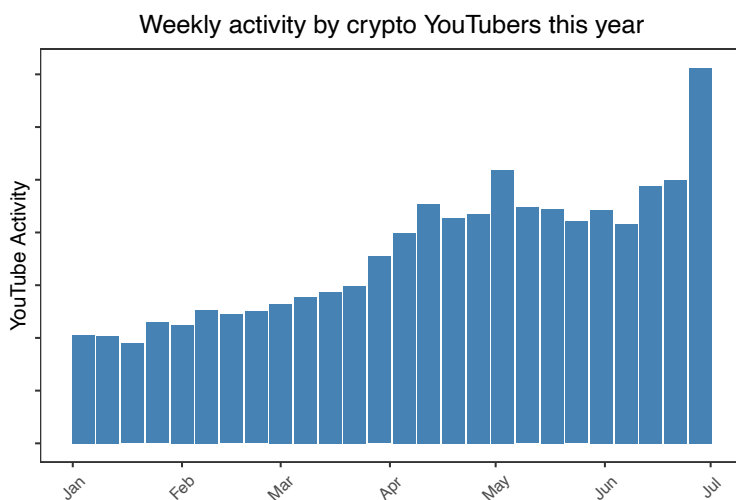


Fig. 2
Total quantity of Crypto Video Content Produced

Percent Increase in YouTuber's Average Views/Video 2020–21

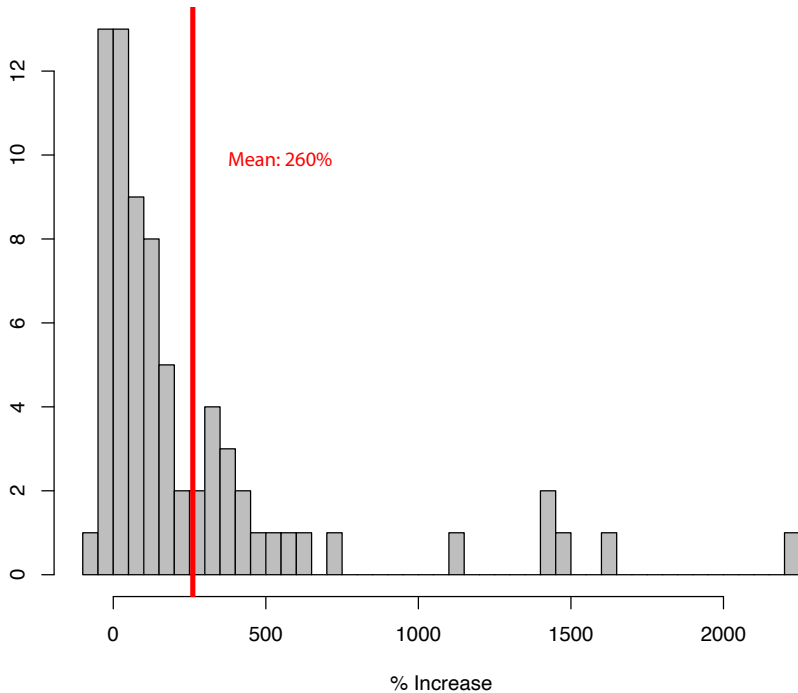


Fig. 3

The change in views/video for 100 crypto-focused YouTubers from 2020 to 2021

Figure 2 shows the growing number of crypto-asset-related videos released since the beginning of 2021. The number of weekly crypto-related YouTube videos has reached all-time highs this quarter. Over the past few years, YouTube has become the central hub and unofficial TV network for the crypto industry. Many influencers regularly garner views in the tens of thousands and large audiences, deeply engaged audiences across several other platforms. The increase in content increases sentiment and, depending on the influencer, decreases the average crypto asset price.

By analyzing a sample of 100 crypto-YouTubers, a series of trends begin to emerge. The data in **Figure 3** shows that each YouTuber, on average, saw views of their channels increase by 260%. On the higher end, the top four influencers after Bitboy Crypto also saw significant increases in average views, including; **Coin Bureau +250%, Altcoin Daily +260%, Sheldon Evans +200%, and JRNY Crypto +1440%**. The data in **Figure 3** also shows increases associated with relatively more minor channels, such as **Investing Made Simple**, which saw average views increase from roughly 1k views per video to over 23k views. Finally, only 19% of the crypto channels analyzed saw a decrease in average viewership.



@CoinBureau



@AltcoinDaily



@SheldonEvans



@JRNYCrypto

Are All YouTubers Created Equal?

Generally, the larger a channel's subscriber base, the greater the average number of views of its videos. However, the size of its following is not an indicator of the audience's cohesion as a group. It also does not suggest the group's likelihood to take action and impact a coin's price, and in some cases, there was a loose correlation.

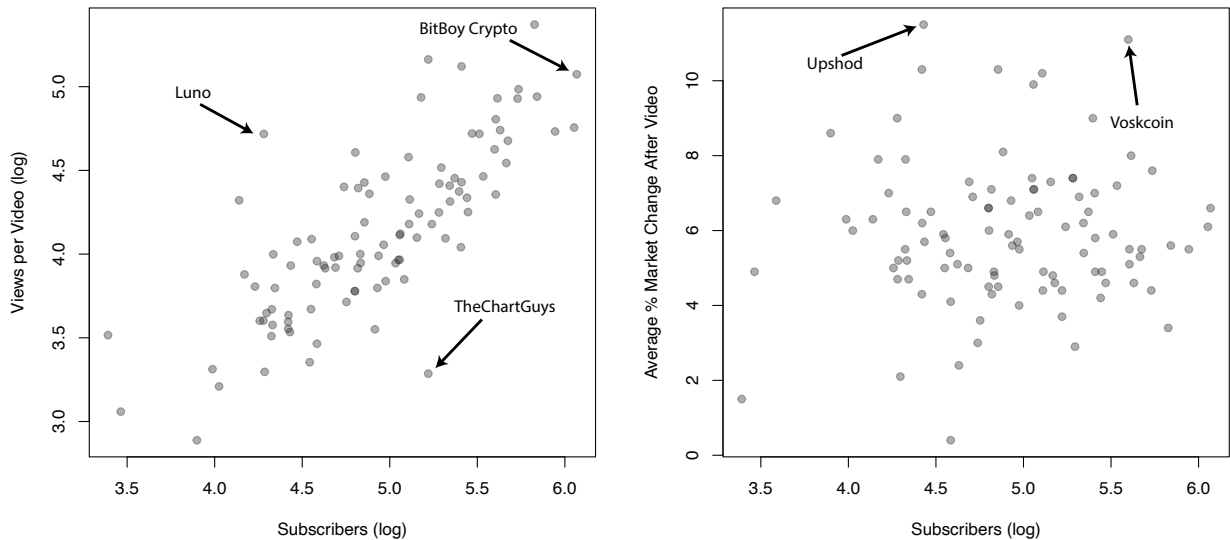


Fig. 4

The left section of **Figure 4** lays out the number of subscribers against average views per video across a group of 100 channels analyzed. The data used to compile the right section shows the number of subscribers compared to the average percent return on a coin mentioned in a video within 48 hours after it was broadcast. While there is a strong correlation between the number of subscribers and the number of views per video, just because a YouTuber has high subscribers and views\ does not necessarily imply that their videos will precede market moves.

While the more subscribers a channel has typically suggests their videos will have more views, the data in the left section of **Figure 4** also shows that due to vast differences in their numbers of subscribers, channels do not have a consistent impact on crypto asset price. Additionally, notable outliers to this rule are Luno, a crypto-YouTuber with a relatively high number of views per video (average 52,474) relative to their subscribers (19,100), and TheChartGuys, who have a relatively low number of views (average 1,931) relative to subscribers (166K subscribers). Luno also had several significantly popular videos that catered to crypto-beginners, such as, "What are smart contracts?" and "What is blockchain," while TheChartGuys, upload an average of three videos per day, which impacts the number of views per video.

Finally, the data in the right section of **Figure 4** suggests the number of subscribers is not directly correlated with an impact on price. The image shows the percent change in crypto asset price within 48 hours after specific YouTubers upload videos focused on the particular crypto asset. While it's

challenging to infer causation or correlation through this analysis, it suggests the channel's knowledge of the market.

This is the case with two influencers **VoskCoin** (337,000 subscribers, average views 42,235) and **Upshod** (71,000 subscribers, average views 26,778).

When **VoskCoin** focuses on a specific asset, the asset increases by an average of 11% in the following 48 hours.

Examples mentions include:

- May 25th - Polygon (MATIC): +39.7%, +15.8% relative to sector (protocols)
- June 22nd - Helium (HNT): +39%, +24.5%, relative to sector (protocols)
- January 5th - Cardano (ADA): +25.6%, 8.5% relative to sector (smart contracts).

Upshod: videos performed similarly, beginning in January 2021, were amongst the highest viewed videos about Dogecoin.

Higher Views = Higher Market Cap

In **Figure 5**, the data shows that videos with the most views focused on specific crypto assets and views increased as the market cap of the crypto assets were higher. This raises a fundamental question: Do YouTubers focus on crypto assets with a higher market cap, or are the YouTubers overall helping to increase the value of the specific crypto assets?

Generally, the data in **Figure 5** suggested that crypto assets with higher market capitalizations tend to get the highest number of views on YouTube. However, there are some notable outliers:

- **Dogecoin** (market cap roughly \$26 billion as of July 12, 2021) receives several views comparable to Bitcoin (approximately \$600 billion as of July 12, 2021) despite having a lower market cap.
- **XRP** (roughly \$47 billion as of July 12, 2021) related videos maintain one of the lowest viewership levels.



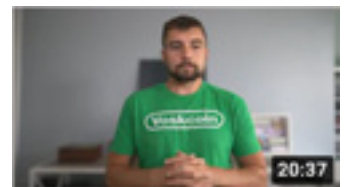
@TheChartGuys



@Luno



@Upshod



@Voskcoin

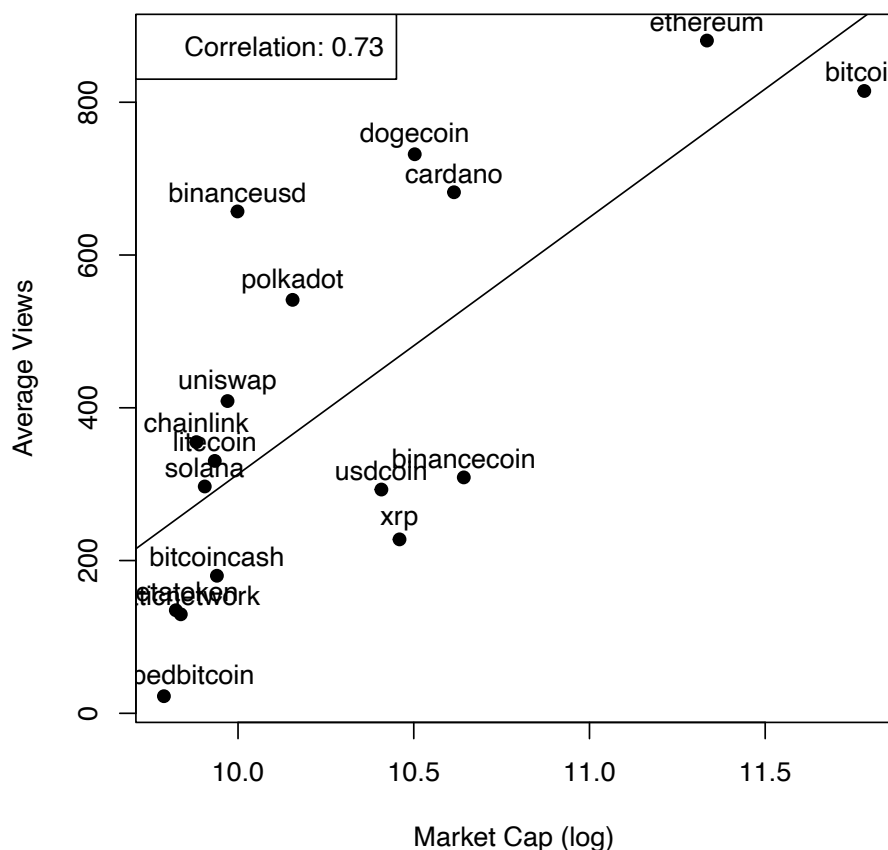


Fig. 5

Market cap of different cryptocurrencies compared to the average number of video views when videos discussed specific crypto assets. The correlation ($\rho = 0.73$) is significant ($p < 0.01$).

The Role of Views and Sentiment

To further understand if YouTube activity played a role in increasing or decreasing crypto asset price, or whether Youtube activity followed the markets (i.e., a leading or lagging indicator), the data in **Figure 6.2** address looked at the number of YouTube views against the sentiment videos overtime and compared these metrics to price performance. A selection of crypto assets from across five categories (Meme, Payments, Infrastructure, Defi, Data Services, and Media) Sentiment was calculated by looking at titles, descriptions, and comments of videos and assigned a score: 2 is a positive sentiment, and a score of 0 is negative sentiment. Sentiment on any given day was calculated by averaging all relevant videos (associated with that token) on that day.

NFT	Infrastructure	DEFI	Payment	Data
ENJ	VET	UNI	ONE	ELF
MANA	SKL	LINK	BCD	NU
FLOW	MATIC	LUNA	NANO	RUFF
SAND	NRG	AAVE	DASH	STEEM
WAXP	REN	DAI	DGB	WTC
RFOX	ONT	SNX	ZEN	HIVE
AXS	ROSE	SUSHI	XLM	CVC
GALA	KSM	GRT	BCN	KIN
COS	QKC	CAKE	DOGE	HOT
REVV	CXK	MKR	DCR	ANT

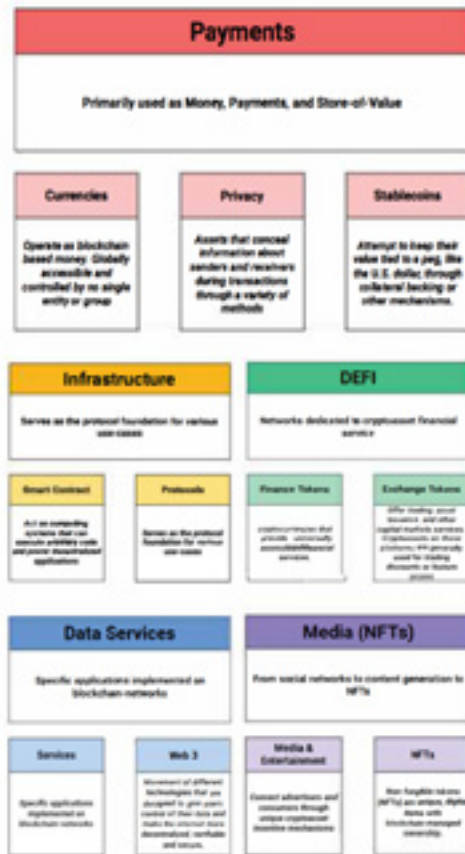


Fig. 6.1

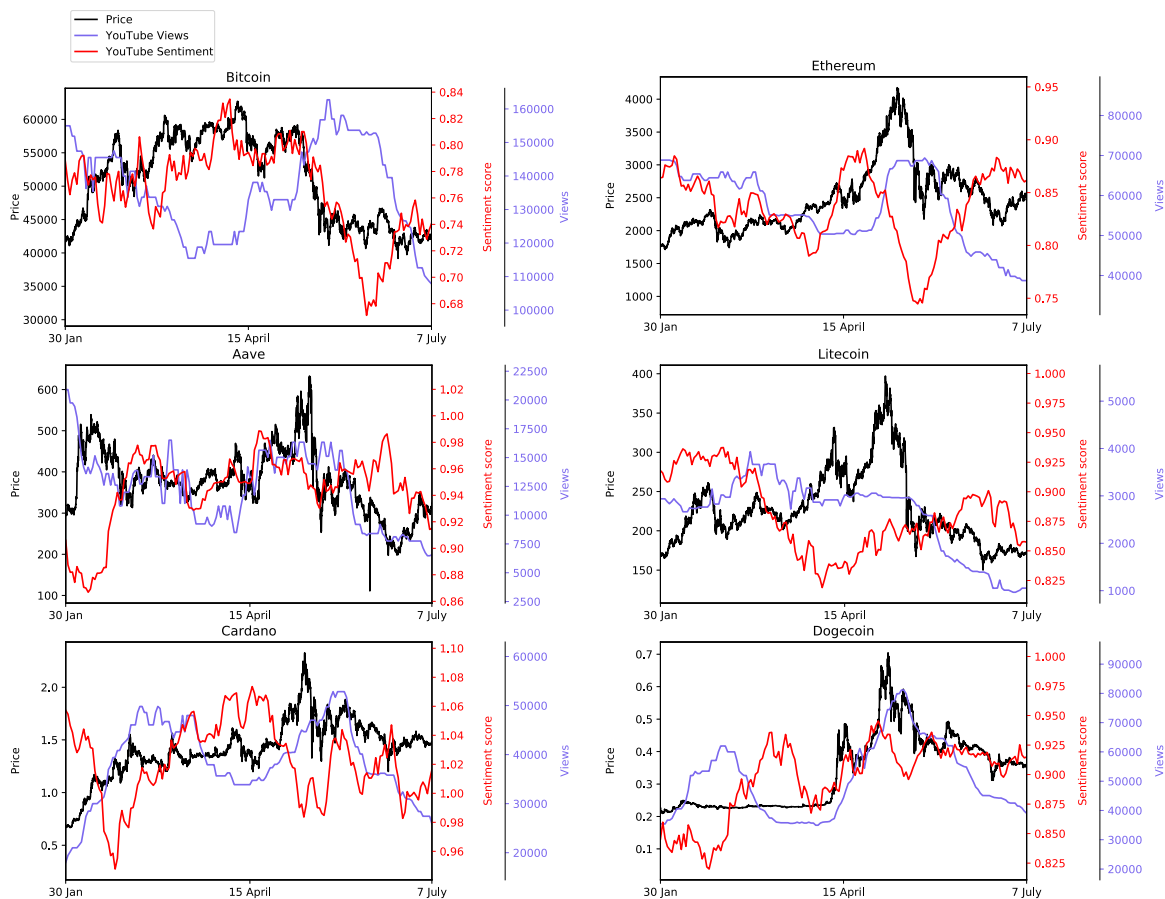


Fig. 6.2

Looking at the price, YouTube views, and YouTube sentiment across six crypto assets.

Bitcoin and **Ethereum** both show peaks in YouTube sentiment before they reach all-time-high prices. However, in both cases, the sentiment significantly decreased as prices dropped, suggesting that sentiment may be a leading indicator for price increases but a lagging indicator for price drops. Additionally, positive videos created hype around the assets before a price increase. Yet as the price dropped, the headlines and descriptions focused on the decline. Peaks in sentiment also occur when video views are at minimums in the number of views and vice-versa, suggesting that when few people discuss these crypto assets, the YouTubers remain loyal. However, when the market is crashing, many YouTubers perpetuate the negativity.

The patterns for altcoins (Aave, Litecoin, Cardano, and Dogecoin) were not as consistent as Bitcoin and Ethereum.

- **AAVE** maintained consistent sentiment of roughly 0.96 throughout most of this year, regardless of price, while its average views closely followed price, decreasing from 22,500 to 7,500 views per video.
- **Litecoin** showed slight increases in viewership from 3,000 to 4,000 views per video before experiencing significant growth. However, sentiment also decreased by 12% during this period.
- **Cardano** followed Ethereum, showing a 10% increase in sentiment and decreased views right before its price peaked in May.
- **Dogecoin** sentiment constantly lags behind price. Data showed that views peaked with price movements, reaching a high of 80,000 views per video before declining significantly to under 40,000 views as the price dropped.

Conclusion

YouTube and the influencers behind the most popular channels showed that the platform plays several roles in the market. First, it is a central hub for themes to grow into trends and for ideas to be distributed. It also serves as a reflection of the overall market and a place where sentiment can come to life. The report surfaced several trends that in some cases were hard facts, in a mix of coincidence and fact, and yet in others purely serendipitous. Sentiment serves as the one metric that cuts across platforms and formats and can provide some throughput for the activity taking place in a market and individual media that is still finding its place.

Moving the Crypto Markets with Tweets

Overview

Investor sentiment is a key driver of the crypto markets. This has been the case since the inception of the crypto markets. While YouTube is the established central informational hub, most of these trends and themes have origins on Twitter. Recently, investors felt the combined impact of Twitter's reach and the power of influence as two prominent figures, Elon Musk (57.7 million followers) and Michael Saylor (1.3 million followers), drove significant changes in overall crypto asset price. Within a few hours after a simple change in Musk's bio to a single word, "Bitcoin," sent the cost of the crypto asset soaring by over 20%.

To help investors understand the overall role and convergence of Twitter reach and sentiment, this section follows the tweets of Elon Musk and Michael Saylor throughout the second quarter of 2021. It demonstrates the impact both had on the sentiment and price of two prominent crypto assets, Bitcoin and Dogecoin. The charts that follow evaluate the price performance, sentiment scores, and tweet volume change between 6 hours before and 24 hours after tweets were published.

Key Metrics in this section:

- **Tweet Volume:** The number of tweets about an individual cryptocurrency over 24 hours.
- **The TIE Daily Sentiment Score:** A measure of how positive or negative conversations on Twitter have been about a particular coin over the last 24 hours vs. the previous 20 days. I.e:
 - A score above 50 implies that conversations have been more positive over the previous 24 hours vs. the previous 20 days, and for scores below 50, more negative.

[Learn more](#) about how The TIE scores sentiment.

Elon Musk Meets Bitcoin & Crypto

The chart below, **Figure 1**, details Bitcoin price vs. tweet volume with an overlay of Musk's tweets. The majority of his Bitcoin-focused tweets began on May 10th, as the price started to decrease from its all-time high of \$60k to \$40k and below.

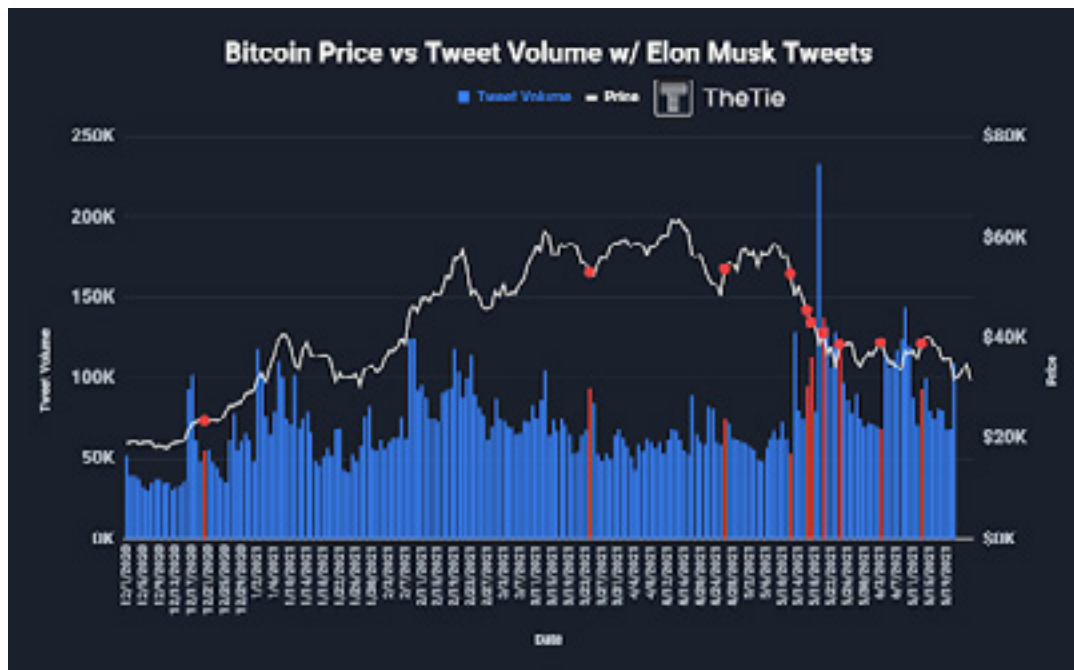


Fig. 1

Next, **Figure 2** shows a complete listing of Musk's Bitcoin-related tweets, with additional data points such as 24hr maximum and minimum returns, change in tweet volume, and changes in sentiment. Topics include Tesla's acceptance of bitcoin payments, talks with miners, and Bitcoin memes. An analysis of the impact of Musk's tweets since December showed:

- On average, Musk's tweets mentioning Bitcoin resulted in a -1.6% decrease in price 24 hours that followed.
- Despite an overall negative impact on Bitcoin's price (average return of -1.6% over 24hr), Musk's Bitcoin-focused tweets positively affected investor sentiment, +23.5%, and overall Bitcoin-Twitter volume +44.4%.
- The three tweets with the most significant negative impact on price referenced:
 - May 16th, 2021: The centralization of mining, Bitcoin price -7.6% 24hr
 - May 12th, 2021: Fossil fuel usage in Bitcoin mining, Bitcoin price -9.4% 24hr
 - May 20th, 2021: How global Bitcoin mining exceeds the energy usage of medium-sized countries, Bitcoin price -11.3% 24hr
- The three tweets with the most significant positive impact on price referenced:
 - April 26th, 2021: Tesla testing Bitcoin selling to provide liquidity, Bitcoin price +2.4% 24hr)

- May 17th, 2021: Tesla hodling its Bitcoin, Bitcoin price +6.4% 24hr
- June 13th, 2021: Tesla resuming Bitcoin payment acceptance when mining usage becomes cleaner, Bitcoin price +8.1% 24hr

Notes	Timestamp	Coin	Sentiment	24hr Return	Max Return	Min Return	Sentiment Change	Tweet Volume Change
1) Elon says Tesla will resume BTC payments when ~50% clean energy usage by miners	12:42 PM - Jun 15, 2021	BTC	Positive	8.1%	10.1%	0.0%	7%	34%
2) Bitcoin Meme	8:07 PM - Jun 3, 2021	BTC	Negative	-2.5%	0.1%	-7.3%	-21%	71%
3) Spoke with North American miners, committed to publish renewable usage	3:42 PM - May 24, 2021	BTC	Positive	-0.6%	5.0%	-3.1%	23%	4%
4) "BTC mining energy starting to exceed that of medium sized countries"	3:13 PM - May 20, 2021	BTC	Negative	-11.3%	3.6%	-11.8%	22%	-16%
5) "To clarify speculation, Tesla has not sold any Bitcoin"	12:06 AM - May 17, 2021	BTC	Positive	6.4%	7.7%	-0.6%	108%	-11%
6) "Bitcoin is high centralized controlled by handful of big miners"	1:17 PM - May 14, 2021	BTC	Negative	-7.6%	0.3%	-9.8%	-64%	87%
7) Tesla suspends vehicle purchases using Bitcoin, concerned about fossil fuels usage	3:06 PM - May 12, 2021	BTC	Negative	-9.4%	0.0%	-13.4%	-44%	153%
8) "I haven't sold any Bitcoin, Tesla sold 10% to prove liquidity of BTC as alt to cash on balance sheet"	4:15 PM - Apr 26, 2021	BTC	Neutral?	2.4%	3.3%	-0.5%	-5%	0%
9) "Pay by Bitcoin capability available outside US later this year"	2:18 AM - Mar 24, 2021	BTC	Positive	-3.1%	4.3%	-5.0%	87%	68%
10) "Tesla operating Bitcoin node directly and won't be converting BTC paid to Tesla back to USD"	2:09 AM - Mar 24, 2021	BTC	Positive	-3.1%	4.3%	-5.0%	87%	68%
11) You can now buy a Tesla with Bitcoin	2:02 AM - Mar 24, 2021	BTC	Positive	-3.2%	4.3%	-5.0%	87%	68%
12) "Bitcoin is almost as good as fiat money"	9:24 AM - Dec 26, 2020	BTC	Negative	1.2%	2.6%	-1.2%	12%	27%
13) "Bitcoin is my safe word"	3:21 AM - Dec 26, 2020	BTC	Positive	1.7%	2.7%	-1.2%	11%	25%
Average				-1.6%	3.7%	-4.9%	23.5%	44.4%

Fig. 2

March 24th: Tesla Starts Accepting Bitcoin Payments

Figure 3 shows that aside from changing his bio to the word Bitcoin, the start of Musk's Twitter frenzy commenced when Tesla announced that it had begun accepting Bitcoin payments for their vehicles. After this announcement, the price of Bitcoin immediately surged, reaching a peak return of 4.3% within 7 hours before it decreased below its pre-announcement prices. Additionally, following the announcement, the number of tweets about Bitcoin increased by 25% in 24 hours, while investor sentiment became increasingly positive. During this period, **The TIE's Daily Sentiment Score** increased by 87% from 42 (negative) to 75 (positive).



Fig. 3

May 12th: Tesla Suspends Bitcoin Payments

The impact of Tesla suspending Bitcoin payments is shown in **Figure 4**. As Musk expressed his concerns about the energy usage from miners, a sell-off of the crypto asset began. The price of Bitcoin dropped -13% within a few hours before consolidating and trending sideways. Over the next 24 hours, investor sentiment also decreased from 43 (low) to 21 (very low), while tweet volume increased by 150%, from 52k to 130k.



Fig. 4

May 16th: Musk on Mining Centralization

The data in **Figure 5** demonstrates another bearish example. When Musk tweeted his concerns over the centralization of mining, the price dropped by -10%. Over the next 24 hours, sentiment also decreased from positive to negative as Twitter conversations surged by 75%. Weeks later, on May 27th, the market had a strong reaction to Michael Saylor's tweet about his meeting with Musk and several miners to discuss energy usage. In the following 24 hours, the price of Bitcoin fell 13%, with investor sentiment shifting from 75 (positive) to 34 (negative).

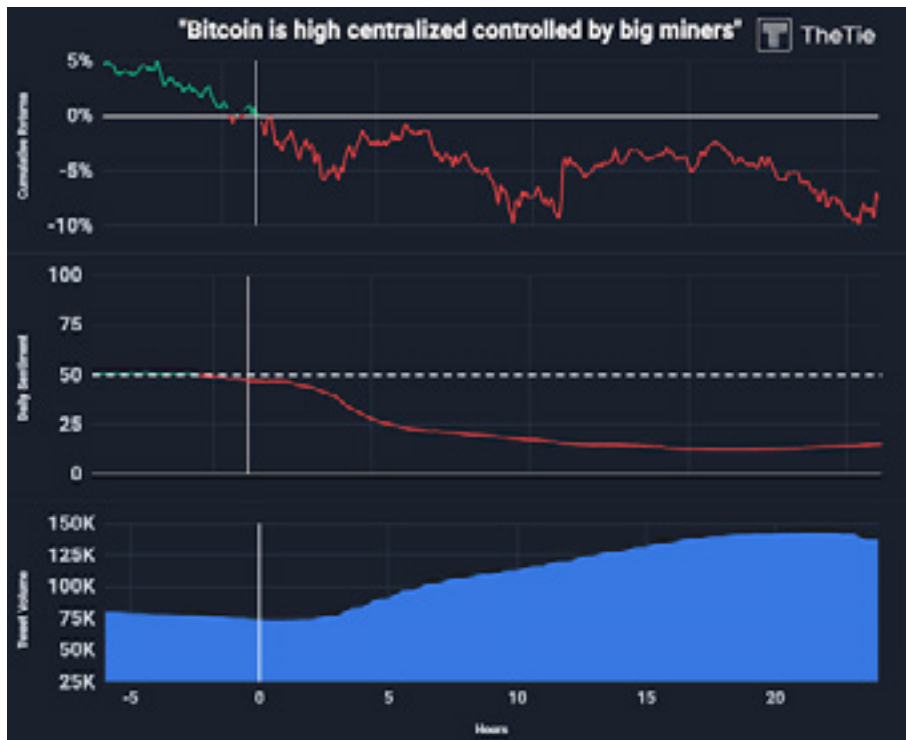


Fig. 5

June 3rd: Musk Shares a Bitcoin Meme

Even a simple meme from Musk's account had the potential to send the market in a new direction. Immediately after sharing the meme in **Figure 6**, the price of Bitcoin dropped 3%, eventually falling 8% within the 24hr period. Investor sentiment once again went from being positive to negative levels.

Fig. 6



Fig. 7

May 16th: Musk Implies Tesla May sell Bitcoin & May 21st: China Clamps Down on Mining and Trading

Figure 7 shows one of the most significant changes in Bitcoin sentiment following tweets from Musk came after he implied that Tesla might sell or had already sold the company's Bitcoin holdings. At this point, sentiment was near the end of a slow recovery to 49 (neutral), but after this tweet, it quickly plummeted to 12 (very negative). Price soon followed, falling from a range of \$49,000 to below \$40,000. While negative news flowed concurrently from China, the price of Bitcoin fell to a low of \$32,561, yet sentiment increased and continued to do so, even as Bitcoin fell lower, getting as high as 70 not long after the lows were set.



Fig. 8

June 13th: Tesla Will Resume Bitcoin Payments When ~50% Clean Energy Usage by Miners

More recently, tweets from Musk had a positive impact on the market. The data in **Figure 9** shows the effects of Musk's announcement that Tesla would resume Bitcoin payments when there is ~50% clean energy usage by miners. Three hours after the tweet, the price of Bitcoin increased by 5%, then continued to grow to 10% over the next 24 hours. Investor sentiment remained positive while tweet volume increased by 20%.

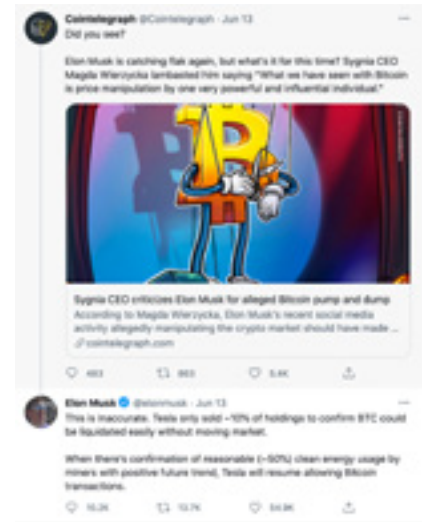


Fig. 9

Enter Michael Saylor & Bitcoin Positivity

Figure 10 overlays tweets from Saylor's on Bitcoin price. It shows the majority of his tweets came as Bitcoin's price increased from \$11k to \$60k. Most present a positive perspective, ranging from announcements of MicroStrategy's recent Bitcoin purchases or overall promoting the asset as a whole.

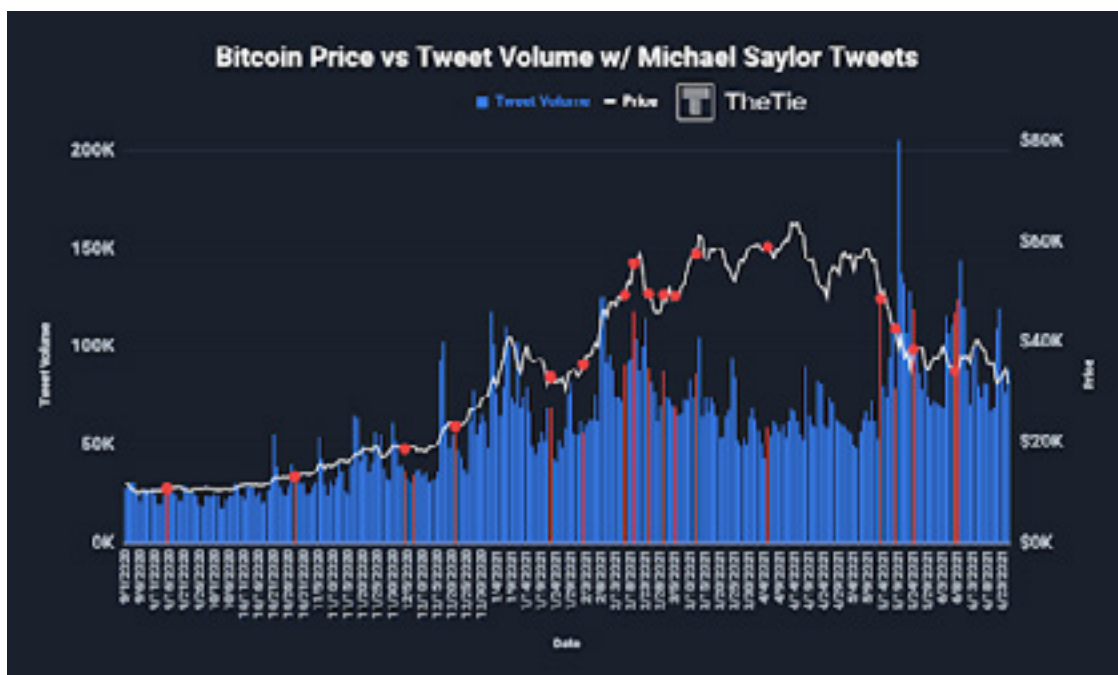


Fig. 10

Figure 11 shows the average impact of Saylor's tweets about Bitcoin. On average, in the 24 hours that follow, price increases by 4.4%, investor sentiment decreases by -0.8%, and tweet volume grows 4.1%.

Michael Saylor Bitcoin Tweets									
Notes	Timestamp	Coin	Sentiment	24hr Return	Max Return	Min Return	Sentiment Change	Tweet Volume Change	
Microstrategy launches "at the market" securities for up to \$100 of Class A common intended to be	6:01 PM - Jun 14, 2021	BTC	Positive	-0.5%	3.2%	-0.9%	-24%	-20%	
\$350m offering completed, holds 92,079BTC total	8:40 AM - Jun 14, 2021	BTC	Positive	-5.5%	0.7%	-2.9%	-17%	-12%	
\$400m offering of senior secured notes	9:54 PM - Jun 8, 2021	BTC	Positive	2.5%	2.8%	-1.9%	-19%	-12%	
Meeting with Elon Musk and leading BTC Miners (bitfury mining council)	7:02 AM - Jun 7, 2021	BTC	Positive	-0.9%	0.1%	-12.6%	-51%	19%	
Microstrategy buys 2249BTC for \$100mil avg. \$43,644	2:47 PM - May 24, 2021	BTC	Positive	-3.4%	1.5%	-8.4%	27%	4%	
Microstrategy buys 2719BTC for \$100mil avg. \$35,287	7:05 AM - May 18, 2021	BTC	Positive	-54.5%	0.0%	-19.2%	4%	35%	
Microstrategy buys 2139BTC for \$100mil avg. \$35,339	7:08 AM - May 18, 2021	BTC	Positive	1.5%	2.4%	-4.8%	9%	-2%	
Microstrategy buys 2629BTC for \$100mil avg. \$37,146	7:07 AM - May 9, 2021	BTC	Positive	0.4%	2.1%	-0.1%	22%	20%	
Microstrategy buys 2059BTC for \$100mil avg. \$48,888	1:04 AM - May 12, 2021	BTC	Positive	5.9%	6.2%	-1.9%	31%	34%	
Microstrategy buys 3289BTC for \$100mil avg. \$45,719	7:14 AM - May 5, 2021	BTC	Positive	0.7%	3.2%	-1.4%	-29%	-1%	
Microstrategy buys 19,452BTC for \$1,025mil avg. \$52,765	7:13 AM - May 1, 2021	BTC	Positive	2.8%	4.9%	-0.4%	2%	2%	
\$1.05bil offering convertible notes 0% coupon, 50% conversion premium completed	7:05 AM - Feb 18, 2021	BTC	Positive	-0.5%	1.5%	-4.2%	2%	-17%	
Proposed private offering of 100mil convertible senior notes	6:07 AM - Feb 19, 2021	BTC	Positive	8.8%	8.8%	0.0%	19%	55%	
Microstrategy buys 1959BTC for \$100mil avg. \$33,809	6:19 AM - Feb 10, 2021	BTC	Positive	5.2%	5.7%	-1.7%	22%	36%	
Microstrategy buys 1148BTC for \$100mil avg. \$31,854	7:47 AM - Feb 2, 2021	BTC	Positive	3.8%	5.4%	-0.9%	4%	7%	
Microstrategy buys 14,444BTC for \$444mil avg. \$31,964	7:09 AM - Jan 22, 2021	BTC	Positive	1.5%	7.8%	0.0%	13%	-31%	
\$444mil proposed offering of \$444mil convertible senior notes	7:04 AM - Jan 15, 2021	BTC	Positive	2.5%	2.6%	-1.9%	-19%	-12%	
Microstrategy buys 1,516BTC for \$550mil avg. \$91,437	4:00 PM - Dec 7, 2020	BTC	Positive	-5.7%	1.2%	-2.1%	1%	15%	
"I personally shed 11,732 BTC which I bought \$1.084 average"	4:00 PM - Dec 6, 2020	BTC	Positive	1.0%	1.5%	-1.4%	-1%	-50%	
Microstrategy buys 14,794 additional BTC for \$1750mil total now 50,108BTC hold	7:02 AM - Dec 10, 2020	BTC	Positive	-1.8%	0.2%	-3.0%	-23%	-30%	
Average				2.2%	3.9%	-1.5%	-0.8%	4.1%	

Fig. 11

June 7th: Saylor Meeting with Elon Musk and Bitcoin Miners

In some instances, Saylor's tweets had a negative impact. **Figure 10** shows sentiment, tweet volume, and bitcoin price after Saylor and Musk met to discuss energy usage in mining. Within the following 24 hours, the price of bitcoin fell by 13%, and investor sentiment shifted from 75 (positive) to 34 (negative).

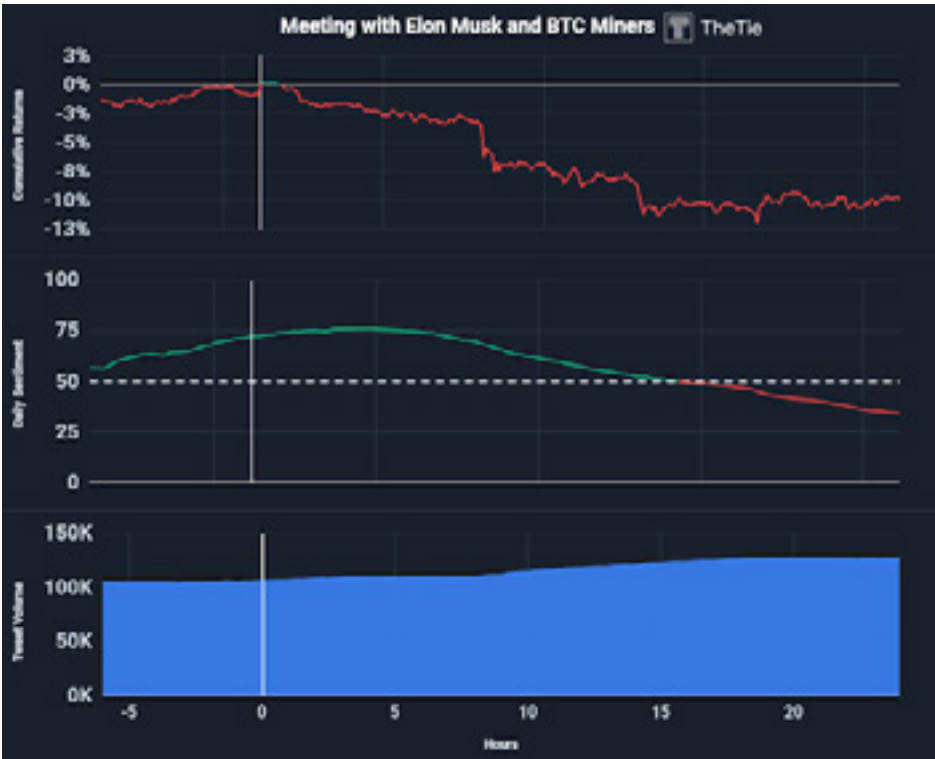


Fig. 12

The DogeFather

While many will point to Musk's tweets as the impetus for the recent volatility in the crypto markets, there are many other factors to consider. His saga with Dogecoin began in 2020 with a short tweet stating "One Word: Doge." The data in **Figure 13** shows how the price of the crypto asset increased by 40% within 24 hours of Musk's first Doge Tweet. A 58% sentiment increase followed this price swing.

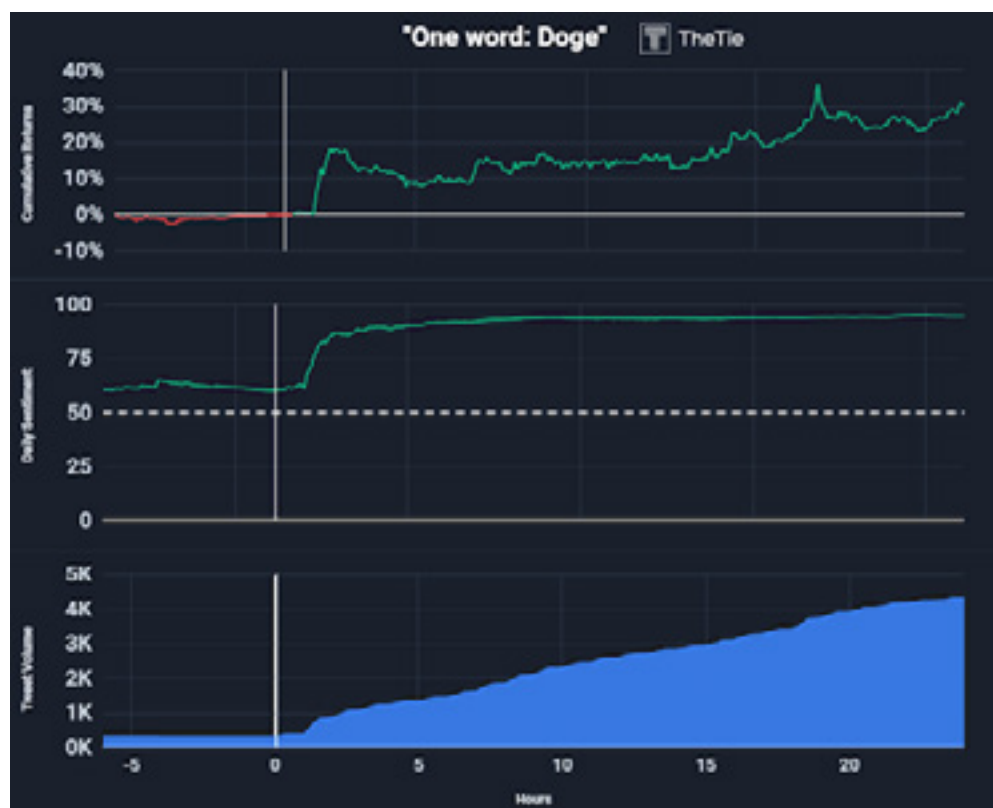


Fig. 13

The data in **Figure 14** presents a more direct correlation between Musk's tweets about Dogecoin. On average, his tweets positively present Dogecoin and played a role in the growth of the crypto asset in the second quarter of 2021. Examples include:

- February 4th, 2021: "No highs, no lows, only Doge" +40% price increase
- April 14th, 2021: "Doge Barking at the Moon Meme" +125% price increase
- May 13th, 2021: "Working with Doge Developers" +40% price increase bringing the market cap to \$10bn

Musk also impacted Dogecoin negatively. On May 9th, after a tweet focused on "SpaceX to Launch Satellite Doge-1 to the Moon," the crypto asset price decreased by -24%.

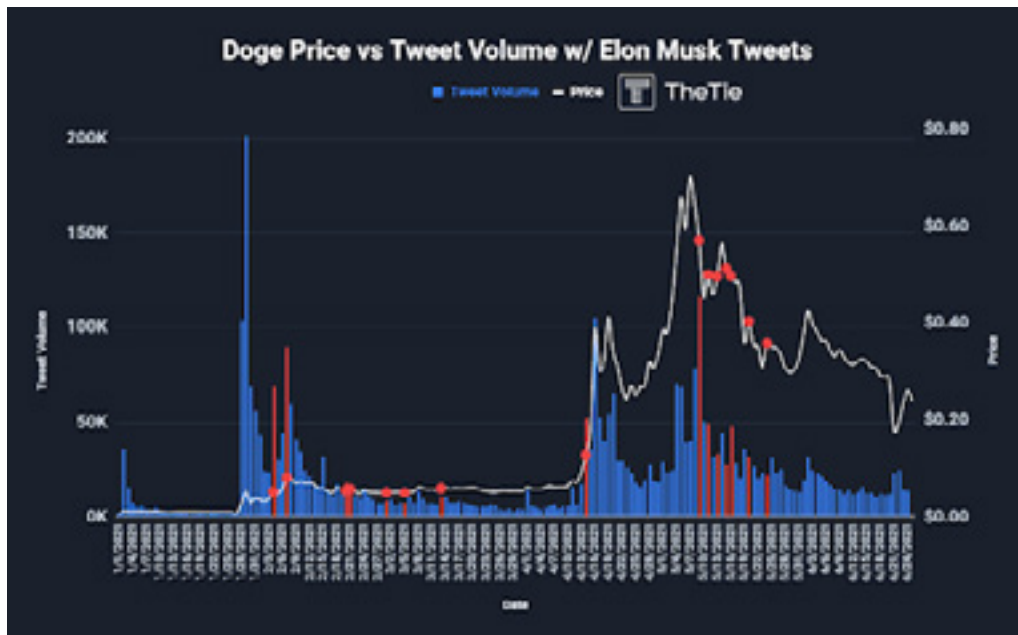


Fig. 14

Average Impact per Tweet by Elon Musk and Michael Saylor

The three charts that follow (**Figure 15, 16, and 17**) show changes in price, sentiment change, and tweet volume change per tweet by Musk and Saylor for Bitcoin and Dogecoin. These two individuals approach their tweeting, and respective social media presences differ.

Changes in Price: The data in **Figure 15** shows that on average, bitcoin decreases by -1.6% return within the 24hr period after musk tweets and an increase of +0.2% after Saylor's. While Musk's Dogecoin-related tweets have a substantially more significant impact, contributing to an average +8.4% increase in price.

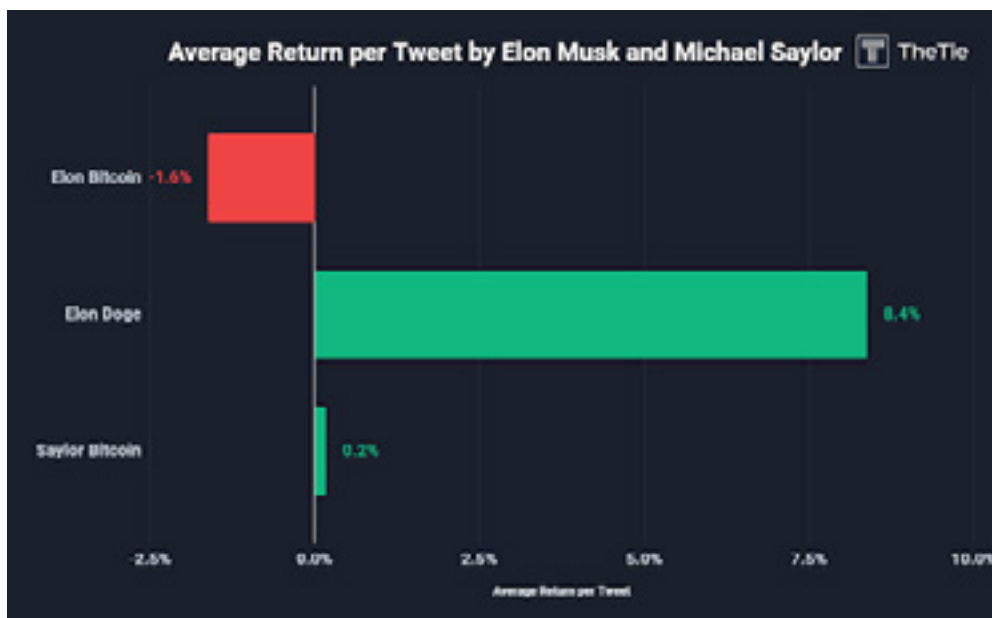


Fig. 15

Changes in Sentiment: Figure 15 shows Musk’s positive impact on investor sentiment for Bitcoin and Dogecoin. While in Saylor’s case, the data tells a different story. Despite a positive, forward-looking, informational-based tone, bitcoin has dropped by -0.8% on average after his tweets.

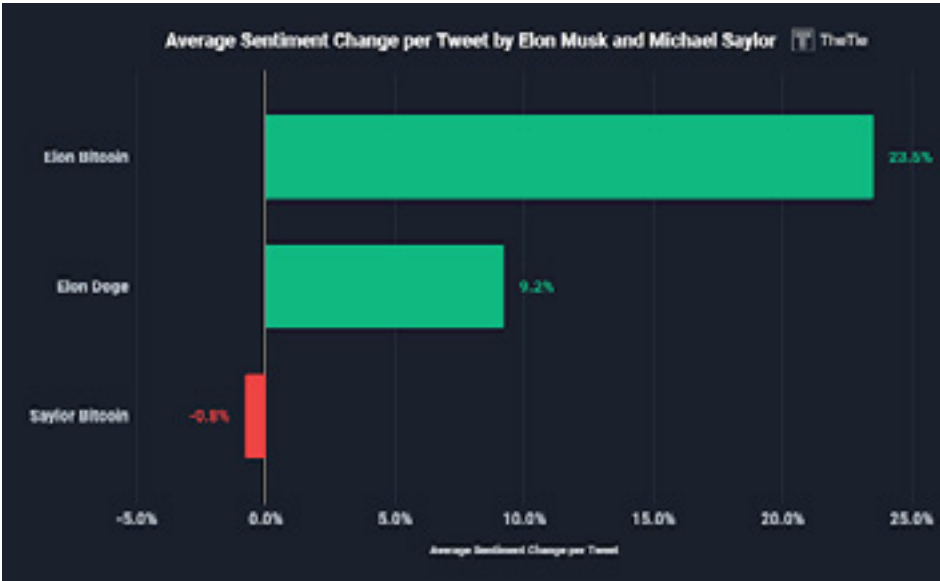


Fig. 16

Twitter Volume: In Figure 16, the data shows Musk and Saylor influence overall conversation on Twitter about Bitcoin and Dogecoin. Typically, within 24 hours of sending tweets, Bitcoin volume increases by 44% and Dogecoin by 99.7%.

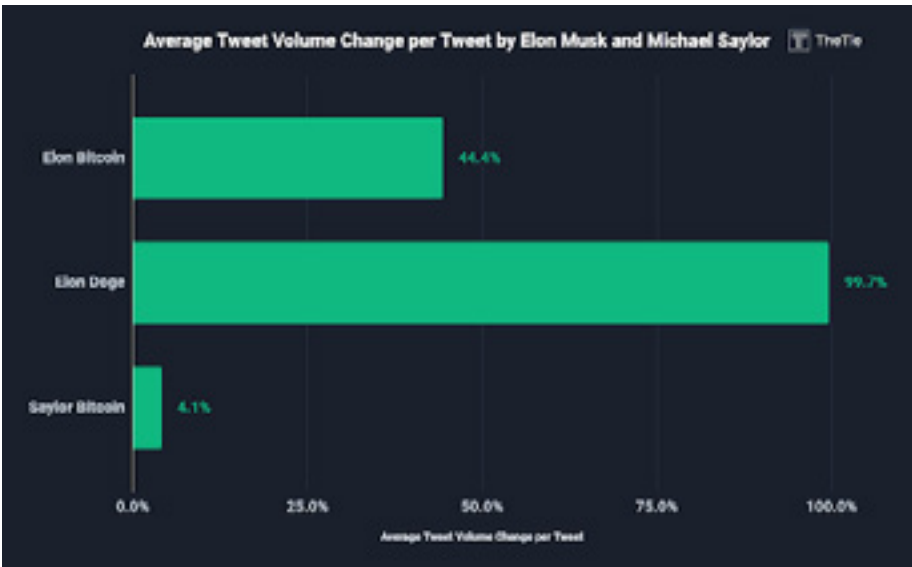


Fig. 17

It’s clear Musk and Saylor, like the influencers in the previous section, occupy very different positions in the market. In many ways, they are analogous to the rising retail investors. Each exists as a market force and can serve as a leader or laggard in the market. While Saylor champions the role of Bitcoin as a new means to store value, Musk seems to lean into crypto assets as a means to challenge the status quo. Above all, this information demonstrates the value of different points of view. There is no single correct answer. It stresses the importance of hard, quantifiable data, like sentiment, which can cut across the many factors in play.

Closing Thoughts

Overall, the data analyzed are a clear example of the forward-looking, always-on information now available to retail investors. Influence comes in many forms, and sentiment has multiple outcomes. With access to information and communication tools, individual investors have demonstrated that at times they act more in a collective fashion, taking cues from whales in banking and finance.

So, as with many other complex topics, the question of how sentiment and influence play out does not have a simple answer, and to truly ascertain how these key metrics fit in, requires a deeper dive into other sources of insight. The data also raises questions around how influencers wield their influence, the role of channels, and how they converge with timing and other factors that impact markets, such as news and advertising.

These questions around information and analysis will only continue to exist. For new investors, it's essential to be aware of the sources of data, and on an individual level, consider their comfort as a means to set guardrails and risk tolerance. On many levels, access to markets and information has been democratized. The same cannot be said for access to technology. As retail investors come to grips with the reality of these facts, they should also consider fundamental truths of markets surrounding why buyers buy and why sellers sell, and above all, who is buying and selling.

Crypto is an evolving asset class where core fundamentals are still to be determined, and patterns have yet to be established. Compared to other asset classes with histories dating back hundreds of years, the sector exists as a dot on the map. So the investors now can shape the future and set standards for research, strategy, and risk. They will decide how subsequent generations view investing and the roles they play in the markets.



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