



# The Temporalities of Bitcoin Returns

Research + Insights

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## Executive Summary

In our continuing analysis of bitcoin returns, we look at returns by month, day of the week, and hour of the day. With the caveat that past performance is not indicative of future performance, our analysis of historical returns by month shows interesting patterns, with strong performance in the spring and early summer months, the fourth quarter, and the month of February. Historical periods of weak price performance on average include the late summer to early fall period, plus the month of March. It appears that bitcoin returns are affected by similar summer seasonality as traditional financial markets, as well as some factors idiosyncratic to the digital asset ecosystem. Examining returns by day of the week, we find a pronounced pattern of outperformance on Fridays and the beginning of the week, which dissipates as the week goes on. We have several working theories as to why Fridays are strong – pay cycles, automatic purchase plans, the timing of market-moving news, and the impact of CME futures trading, but no strong conclusions. Regardless, we think it is a timing factor that investors should be aware of. We believe the start of the week is strong because the traditional banking system is closed over the weekend and Sunday night (Asia's Monday morning) and Monday are the first times that fiat can move onto exchanges. Our analysis of hourly returns finds little of note, although deeper market inspection around specific events may be of interest for future research.

## Seasonal Patterns but Uniquely Crypto

“Sell in May and go away” is an adage used to describe the seasonal patterns of stock market returns – the best returns are believed to be the months November through April. Our analysis of monthly returns reveals a pattern that shows seasonality, but one that is uniquely situated for bitcoin. If we are to describe it best in words, it is that historically on average the first quarter has shown monthly returns that oscillate back and forth, returns in spring have started off strong and waned as the summer months went on, and the year has finished with an outstanding fourth quarter.

### Monthly Bitcoin Returns

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
<b>2015</b>	-30.6%	15.8%	-3.4%	-2.9%	-2.9%	13.8%	8.2%	-18.8%	3.4%	31.3%	20.4%	15.8%
<b>2016</b>	-14.2%	16.5%	-4.2%	7.9%	17.7%	29.0%	-9.0%	-7.7%	6.8%	16.4%	4.8%	29.3%
<b>2017</b>	0.5%	23.2%	-9.5%	29.0%	68.5%	3.6%	17.2%	66.5%	-9.5%	49.1%	54.3%	37.8%
<b>2018</b>	-26.6%	4.6%	-34.3%	30.2%	-16.2%	-15.4%	18.7%	-6.4%	-6.3%	-4.6%	-37.2%	-6.3%
<b>2019</b>	-8.2%	12.2%	8.3%	29.8%	58.9%	29.3%	-9.5%	-3.7%	-12.5%	7.8%	-19.2%	-2.1%
<b>2020</b>	30.6%	-8.6%	-25.7%	35.9%	10.1%	-4.3%	24.5%	2.9%	-7.7%	26.9%	41.4%	51.1%
<b>MONTHLY AVERAGE</b>	-8.1%	10.6%	-11.5%	21.7%	22.7%	9.3%	8.4%	5.5%	-4.3%	21.2%	10.7%	20.9%
<b>MONTHLY MEDIAN</b>	-11.2%	14.0%	-6.9%	29.4%	13.9%	8.7%	12.7%	-5.0%	-7.0%	21.6%	12.6%	22.5%
<b>DAILY AVERAGE</b>	-0.23%	0.44%	-0.33%	0.68%	0.62%	0.33%	0.30%	0.14%	-0.10%	0.64%	0.29%	0.65%
<b>P-VALUE</b>	23.3%	26.1%	12.9%	3.2%	5.3%	37.9%	41.8%	78.5%	59.8%	4.2%	52.7%	5.1%

Source: NYDIG

## A Back and Forth First Quarter

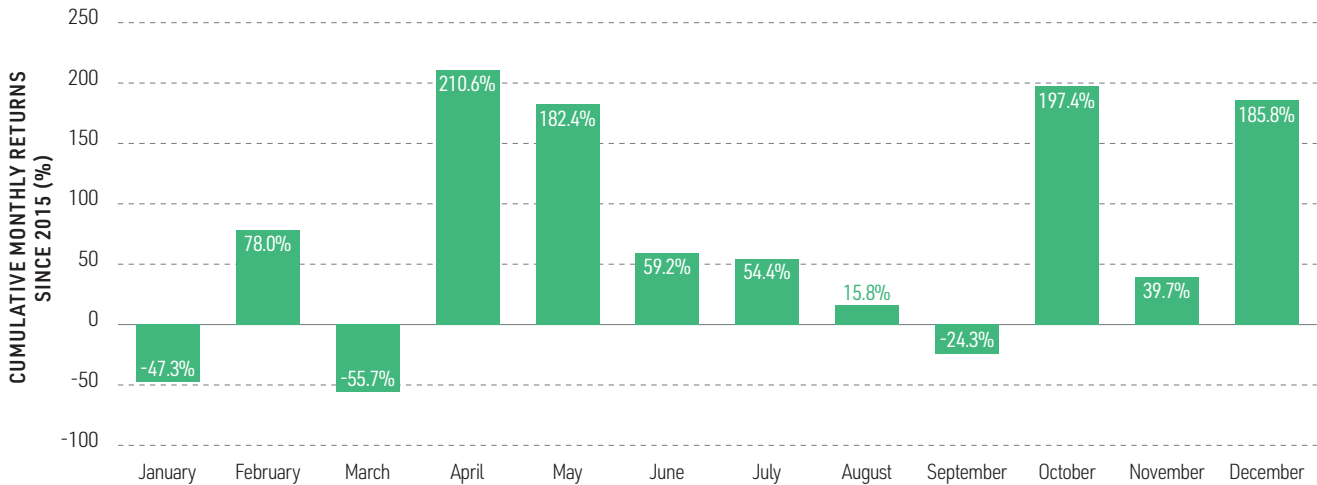
The first calendar quarter typically has had uneven performance on average, with a strong February shouldered by a weak January and March. This year started off differently, however, with January registering strong returns, reminding us that historical seasonal patterns are not prescriptive regarding future returns. Two calendar events that are often identified as reasons for these fluctuations, Chinese New Year and the US tax filing deadline. Over the study period, Chinese New Year has landed in both January and February, depending on the year. The consistency of the weaker January and stronger February, regardless of which month Chinese New Year landed in, makes the connection to returns less obvious to us.

The US tax filing deadline on April 15 is another calendar event that is often cited as a reason for monthly return patterns. The theory is that March exhibits weakness as bitcoin investors sell positions ahead of the filing deadline to pay for taxes owed. As tax refunds come back to other investors, those proceeds are used to buy bitcoin. While our analysis does not prove causality, we find this theory interesting, nonetheless. As perhaps a point of supportive anecdotal evidence, the 2020 tax filing date was pushed out to July 15<sup>th</sup> because of COVID-19 and bitcoin did show a weaker than average June and stronger than average July.

## Strong Spring Returns That Wane as Summer Rolls On

As the following chart shows, on average April has historically been exceptionally good for bitcoin returns. These monthly average returns, while typically still strong in May, eventually decline as the summer months progress. These returns bottom in August and September, which have historically been weak months on average. This paves the way for the fourth quarter, which on average has been strong, similar to the second quarter.

### Cumulative Bitcoin Returns by Month (2015 - 2020)

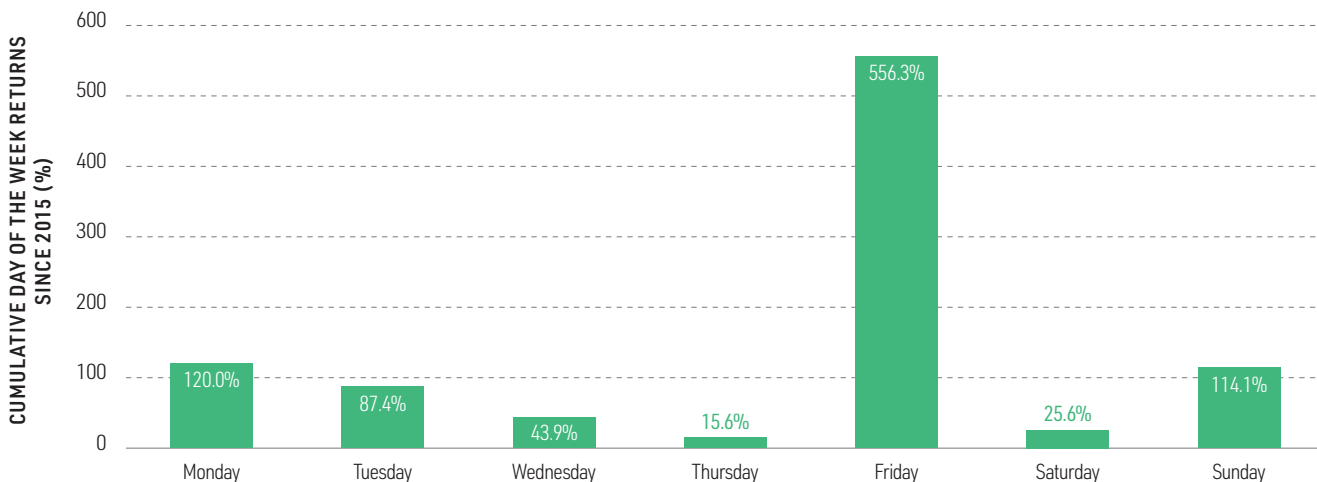


Source: NYDIG

## Fridays, Beginning of the Week Dominate Daily Returns

By looking at returns by day of the week, we find interesting patterns that are shaped by the idiosyncrasies of bitcoin markets. Our first observation is the cumulative returns on Fridays (Eastern Time), which dwarfs all other days of the week. An interesting second observation is the cumulative performance of days early in the week, which trails off as the week progresses. We have theories as to why these two patterns exist, although we caution that these theories are hard to test.

### Cumulative Bitcoin Returns by Day of the Week (2015 - 2020)



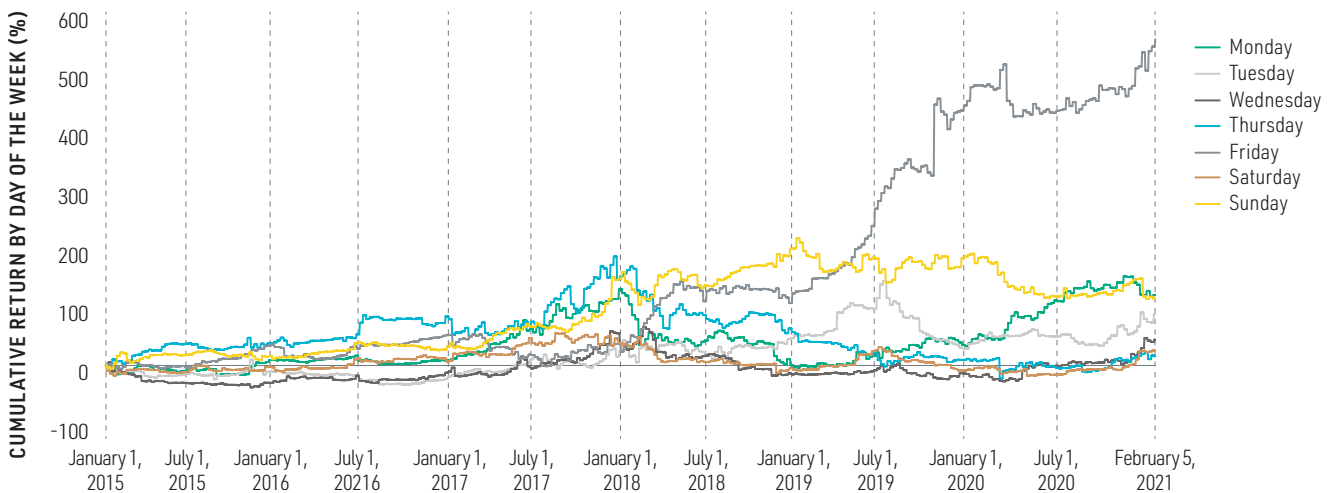
Source: NYDIG

## Fridays I'm in Love

Our analysis of cumulative returns on Fridays shows significant outperformance versus all other days of the week. We have several theories as to why Fridays might be impactful to returns, but little conclusive proof as to the exact reason. Some of these theories are the timing of payday or repeating purchase orders for retail investors averaging into positions. We have also noticed several positive news items on Fridays, like Elon Musk adding the bitcoin emoji to his Twitter profile, or China unveiling its DC/EP (Digital Currency/Electronic Payment) platform. Friday is also the last day of the week to transfer money to exchanges through the traditional banking system in the US. Perhaps investors rush to transfer money to exchanges before the weekend starts.

One final theory is that this Friday anomaly has to do with the rise of trading of bitcoin futures on the CME, which ceases on Friday evening and resumes again on Sunday evening. Traders unwilling to take the gap risk, the risk of discontinuous price movements because futures markets are closed on Saturday and Sunday while spot continues to trade, may be a reason. Given bitcoin's positive return bias, it makes sense to us that more shorts would be covering ahead of that gap period. While this Friday impact calls for closer study, we think investors should be aware of the phenomenon, nonetheless.

### Cumulative Bitcoin Returns by Day of the Week (2015 - 2020)



Source: NYDIG

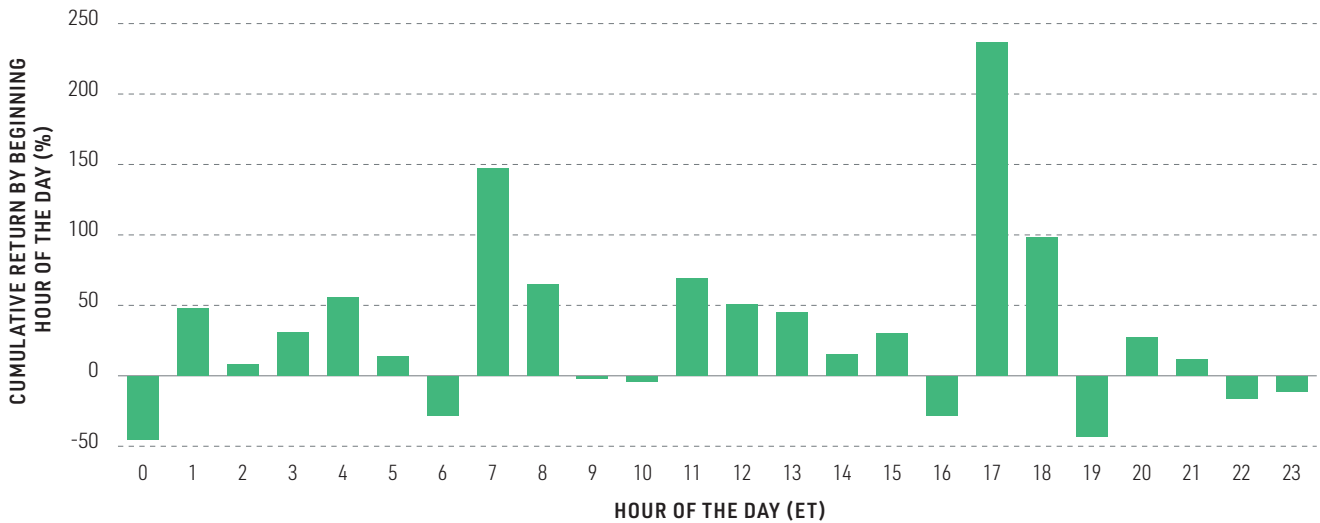
## Beginning Part of the Week Likely Affected by the Movement of Cash

The second observation about daily returns that we think is important to make is the positive returns at the beginning of the week that trail off as the week goes on. We think this primarily has to do with the fiat banking system and ability to move money to and from exchanges. Over the weekend, banks in the US do not process transactions meaning fiat cannot come onto an exchange to buy bitcoin until Monday morning (Sunday night in the US is Asia's Monday morning). To us, this a plausible explanation as to why cumulative returns are clustered at the beginning of the week, but then decline as the week progresses.

## Hour of the Day Returns Reveals Two Small Pieces of Information

Our final temporal analysis, hour of the day, is not as striking as the previous two categories, but we think there are two interesting observations. The 7 AM ET - 8 AM ET period (hour 7 in the following graph), as US traders are just beginning their day, does show positive price performance. In addition, the 5 PM ET - 6 PM ET window (hour 17 in the following graph) window, as the US trading day is winding down, also shows positive price performance. Other patterns are difficult to discern from the hourly data.

### Cumulative Bitcoin Returns by Hour of the Day (ET)



Source: NYDIG

## Conclusion

We hope the returns timing analysis covered in this report, monthly seasonal trends, day of the week returns, and returns by hour, gives investors a clearer picture as to some of the return drivers of bitcoin. While the style of this analysis may seem familiar to traditional market investors, the factors at play are often unique to bitcoin markets. Not all the anomalies we identified are easily explained and some warrant further analysis. We hope to explore some of these topics in future reports, but also note that bitcoin markets are continually changing, inviting new questions just as old ones are answered.

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