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# TRIVARIATE RESEARCH

## IS CRYPTO PERFORMANCE A RISK TO MONITOR?

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## RESEARCH SUMMARY AND CONCLUSIONS

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A critical part of Trivariate's research objective is to identify and measure portfolio risks in unique ways and to evaluate emerging risk factors. The same way interest rates are now an obvious risk metric (trust me, they were not to the average semiconductor analyst 15 years ago) to account for within an equity portfolio, so too may cryptocurrency ultimately be an important risk factor.

With our mantra being "if risks didn't change anyone could do risk management" we thought timing was good to establish a framework for measuring crypto risk through the lens of US equities. After all, Bloomberg TV is now updating Bitcoin and Ethereum performance at the same frequency as they update the SP500 performance, and it seems apparent that crypto performance is a proxy for broad speculation, inflation, or other factors.

We created a simple basket by averaging the daily performance of Bitcoin and Ethereum to create a Trivariate crypto basket that has daily returns and sufficient history. We evaluated the relationship between crypto performance and US equities to assess company-specific risk, trading relationships to various stock baskets, and searched for individual stocks that are correlated (anti-correlated) to our crypto basket in case ultimate hedging / replication is of interest.

## CONCLUSIONS

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Crypto is highly idiosyncratic, with our 7-factor equity model explaining only about 15% of the crypto basket's performance today. That relationship shifted some since COVID, with both stocks and crypto selling off in-lock step during March of 2020.

Our beta-adjusted inflation basket and our hyper growth junk universe (proxies for inflation and speculation) have both begun to be statistically significantly associated with crypto's performance over the last few months. Our judgment is that crypto is part speculation, and part an inflation-hedge and the performance of our crypto basket seems like a good gauge to monitor.

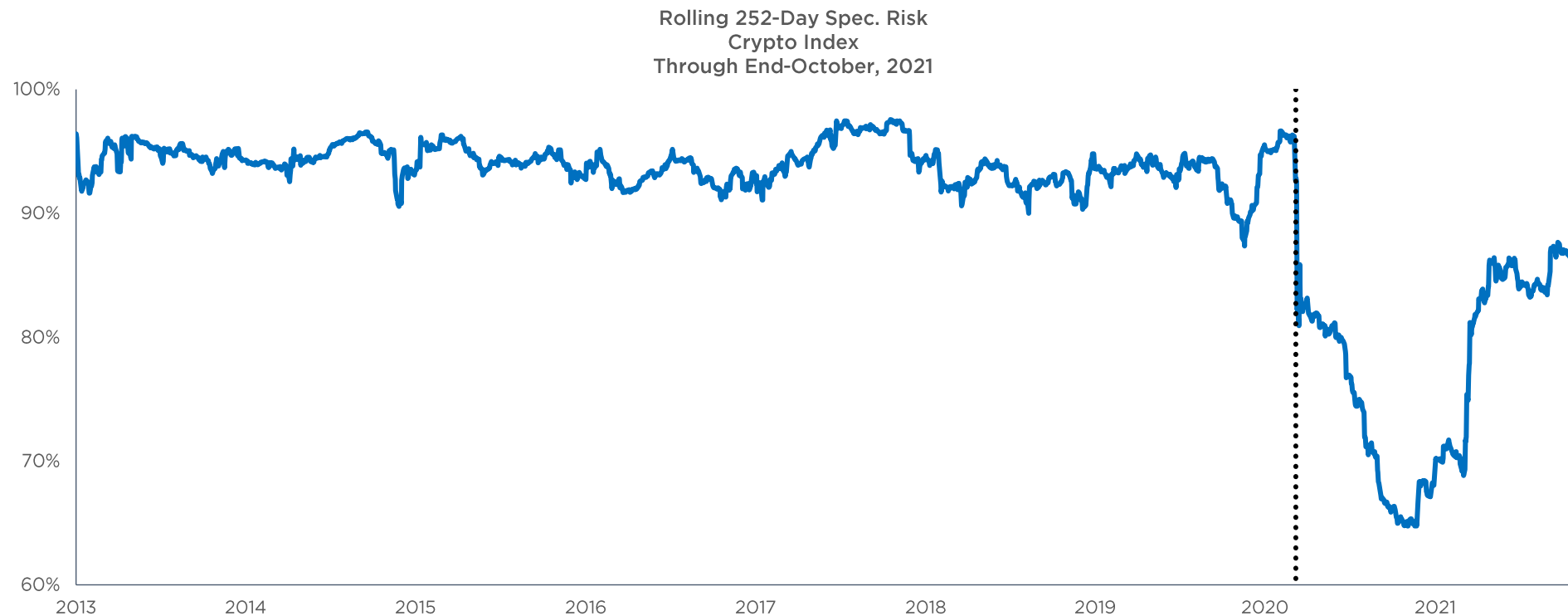
The top decile of equities has about a 0.25 correlation to the crypto basket over the last three months – so there are not a broad-group of equities trading in lock-step with crypto.

For those investors hoping to get consistent crypto exposure through a basket of US equities, that will not be possible (yet) as performance massively lagged our crypto basket, and correlations materially oscillated.

On slide 9, we highlight the top 20 most correlated (anti-correlated) stocks so investors can be aware of the names that have speculation / inflation risk and begin to monitoring this potential key risk gauge.

## CRYPTO IS A HIGHLY IDIOSYNCRATIC ASSET CLASS

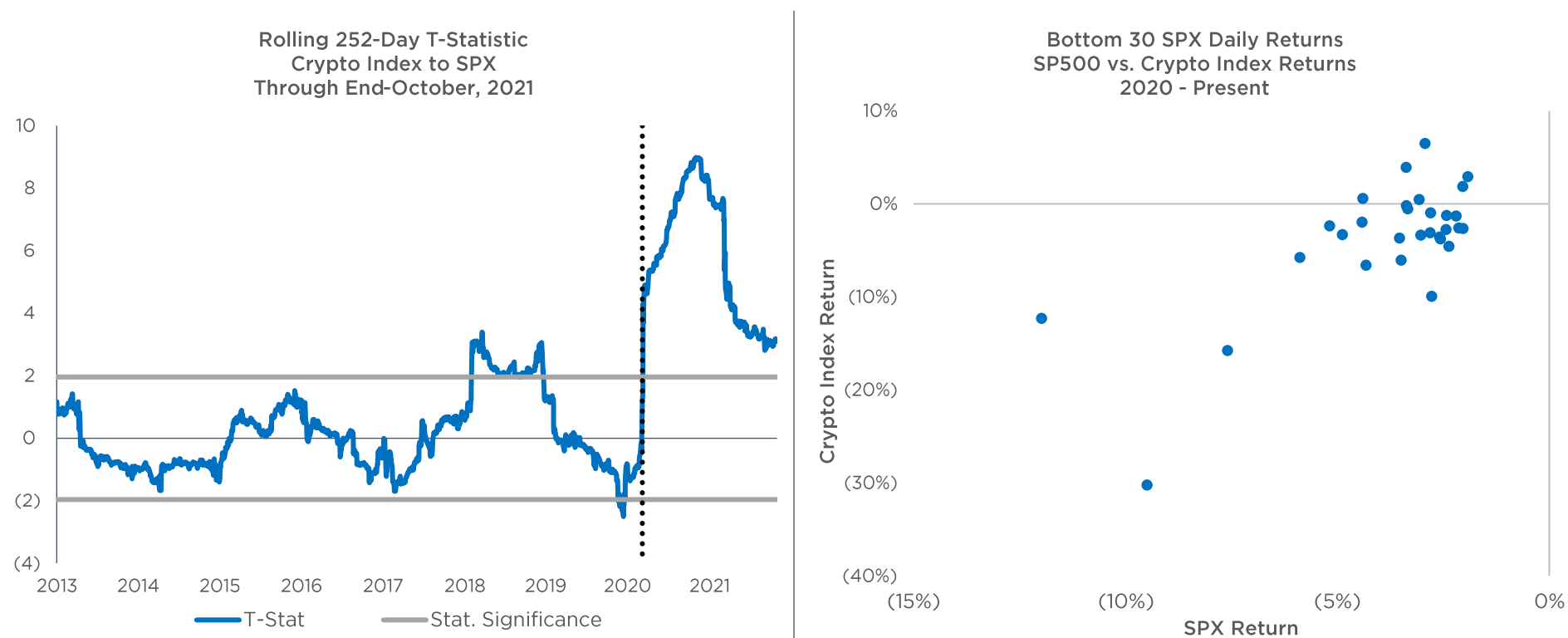
We took our proprietary seven-factor model (see note below) to assess if the crypto index's return can be explained by common US equity market factors. The answer is "no." Crypto was highly idiosyncratic all the way through the beginning of the COVID crisis (black dotted line is March 9th, 2020). Only about 15% of the crypto index's performance can be explained today by our model, down from 5% pre-COVID, but still not explained by a common group of equity market metrics



Note: The median's stock return can be explained by our proprietary seven factor model – equity market beta, two size factors (mega/large vs mid and mid vs. small/micro), style (growth vs. value), substance (quality vs. junk), liquidity, and momentum. At the peak of the COVID market hysteria, nearly 70% of the average stocks' return could be explained by these macro signals. Today, it is less than 50%.

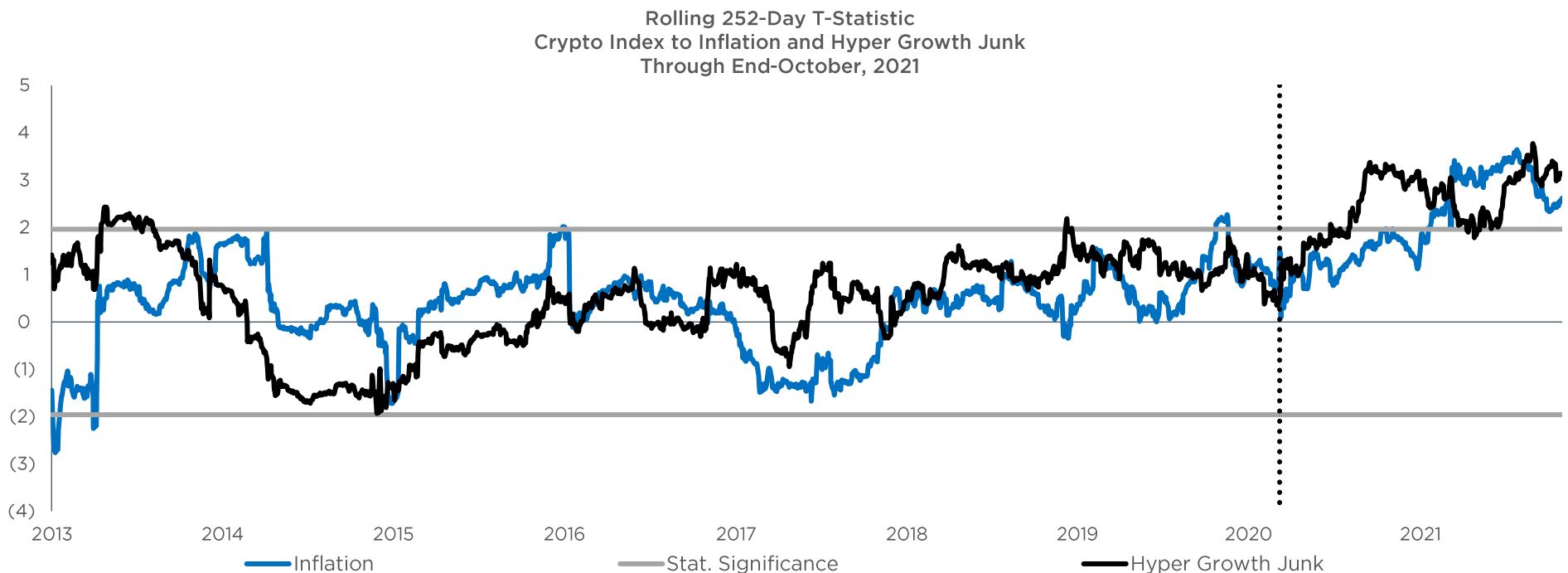
## CRYPTO HAS TRADED MORE IN-STEP WITH THE SPX SINCE COVID

We analyzed the relationship between the crypto index's returns and the SP500 and noticed the relationship became statistically significant starting on March 9<sup>th</sup>, 2020 (left chart). Largely, this is because all risk-taking was smashed during March, with the scatter plot on the right chart showing the thirty worst days for the SP500 during COVID and the crypto-basket's same day performance. For instance, crypto was down 30% one day when the SP500 was down 9%, and both were down 12% the same day during March of 2020 as well



# CRYPTO SEEMS NOW PART SPECULATION, PART INFLATION RELATED

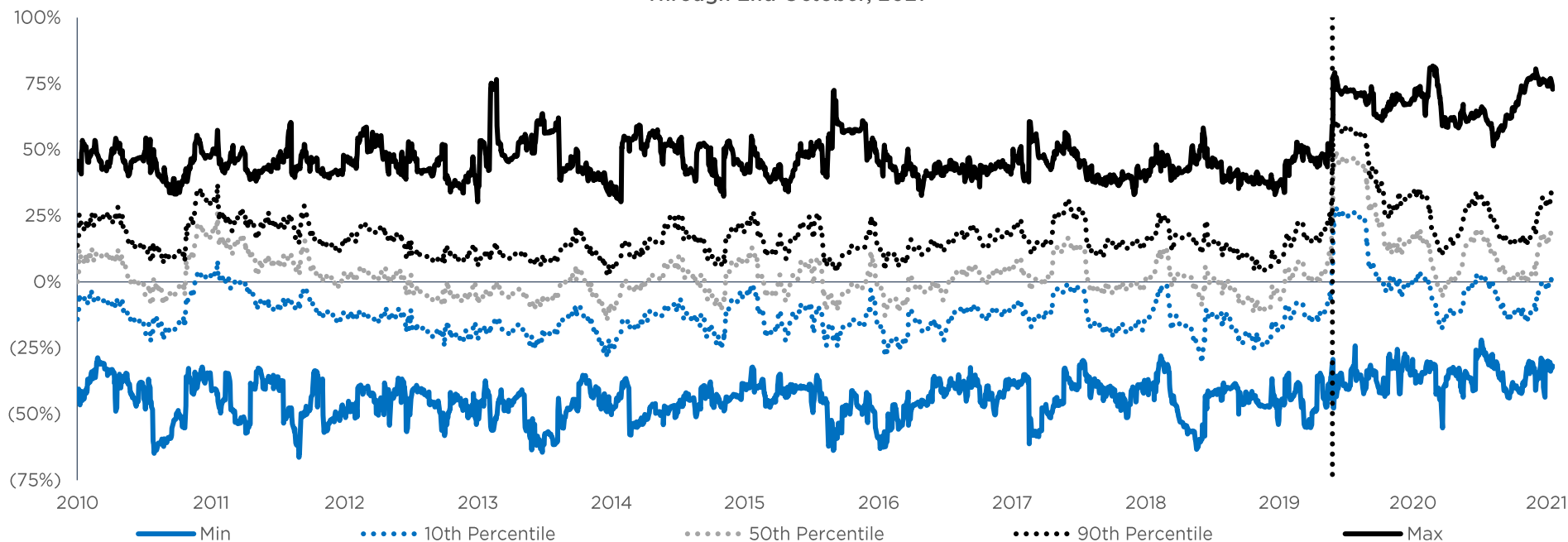
The tighter association of our crypto basket's returns to the SP500 since COVID motivated us to analyze whether there was any statistically significant relationship between its performance and our beta-adjusted inflation basket (in blue) and our hyper growth junk universe (in black) below. Both had virtually zero relationship until COVID, and both now have some statistical significance, above and beyond other factors. In our judgment, a logical conclusion is that crypto is part speculation, part hedge on the devaluation of fiat currencies driving inflation. We think it will be interesting to monitor this trend going forward, as the massive government stimulus following COVID certainly renewed fears that ultimate rampant inflation is a possibility



## LOOKING AT THE DISTRIBUTION OF RETURNS, IT HAS SHIFTED HIGHER

We looked at the min, max, bottom and top decile, median stocks' correlation to the crypto-basket over time, to get a sense of the distribution of the correlation of returns between the crypto basket and US stocks. The last 3-month's daily correlation between the crypto basket and the 90<sup>th</sup> percentile has shifted up to about 0.25. The median stock is barely correlated (dotted gray line). Interestingly, the max correlation has shifted higher in the last year, indicating that there are some US equities that are more structurally associated with crypto - such as RIOT or MSTR

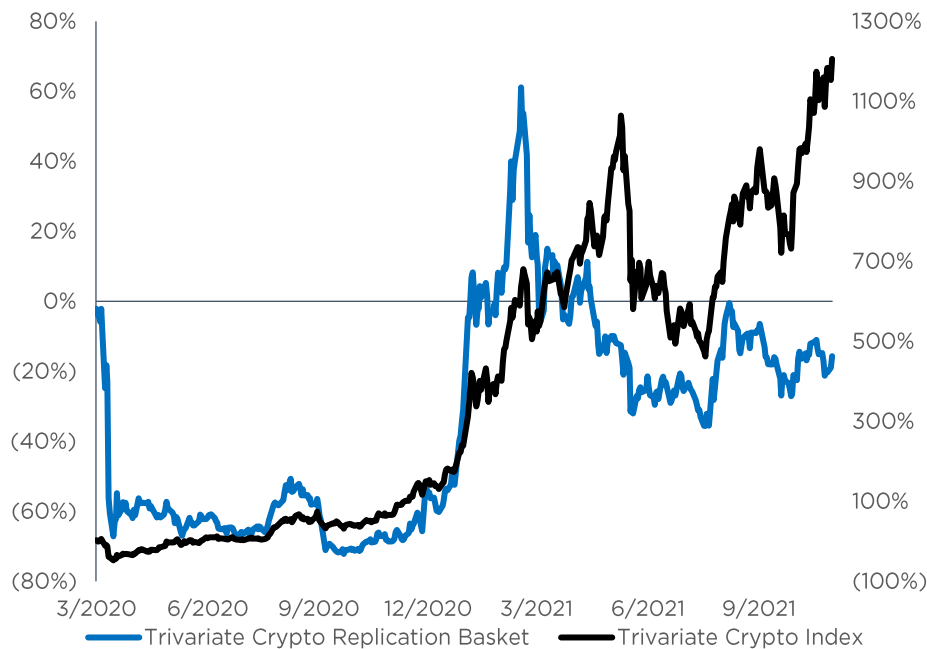
Rolling 63-Day Correlation  
US Equities to Crypto Index  
Through End-October, 2021



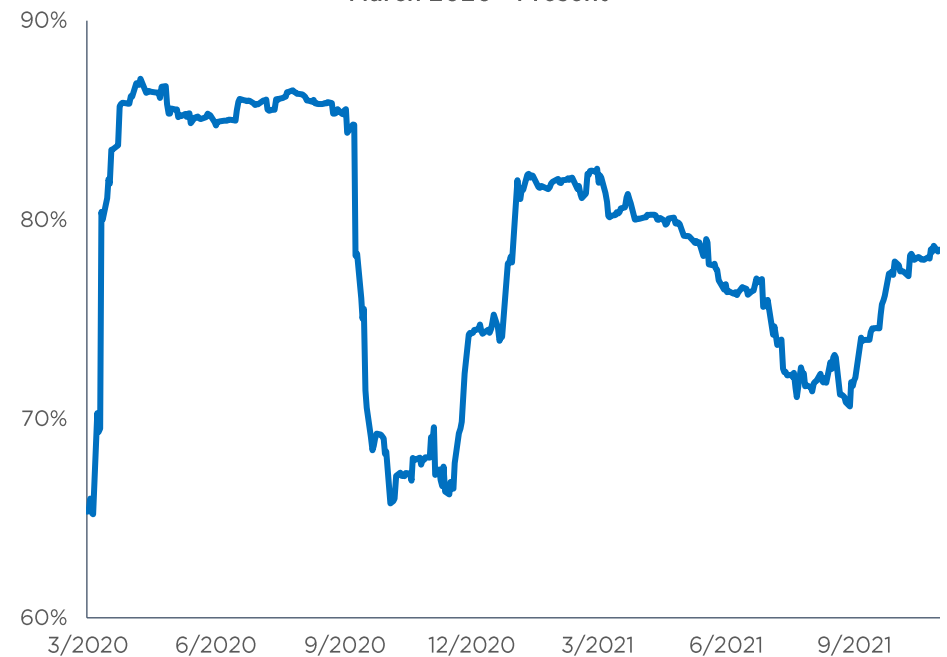
# HEDGING / REPLICATING CRYPTO THROUGH EQUITIES IS NOT FRUITFUL

We created a basket of stocks to try to replicate crypto performance. The bad news is that playing our crypto basket through a stock-level US strategy is not possible today. The stocks (blue line, left chart) massively lag, indicating to us that it is basically impossible to get crypto-exposure through US equities. The rolling correlation between a daily-rebalanced basket of stocks and the crypto-basket is volatile, and hence, impractical

Daily Compounded Mean Returns  
March 2020 - Present



Rolling 63-Day Correlation  
Trivariate Crypto Replication Basket to Crypto Index  
March 2020 - Present





## TOP 10 MOST CORRELATED, LEAST CORRELATED STOCKS

The most correlated stocks to the crypto basket include some (like MSTR, RIOT) that are in part “crypto stories” and others where the relationship is either spurious, or also part speculation / part inflation (left side). The most anti-correlation stocks are pretty idiosyncratic (right side)

Top 10 Most and Least Correlated to Trivariate Crypto Index i.e., the members of the replication basket  
November 2, 2021

Most Correlated					Least Correlated				
Ticker	Company Name	Industry Group	Correlation	Market Cap (\$ US. Bil)	Ticker	Company Name	Industry Group	Correlation	Market Cap (\$ US. Bil)
PAYX	Paychex, Inc.	IT Services	51.4%	44.51	XLRN	Accelaron Pharma Inc.	Biotechnology	(24.5%)	10.56
PTC	PTC Inc.	Software	50.5%	14.84	TMX	Terminix Global Holdings, Inc.	Diversified Consumer Services	(22.7%)	4.96
FNF	Fidelity National Financial, Inc.	Insurance	51.8%	13.77	VIR	Vir Biotechnology, Inc.	Biotechnology	(27.4%)	4.80
SEE	Sealed Air Corporation	Containers & Packaging	50.1%	9.09	CXP	Columbia Property Trust, Inc.	Equity Real Estate Investment Trusts (REITs)	(25.4%)	2.20
MSTR	MicroStrategy Incorporated	Software	72.9%	8.23	NOTV	Inotiv, Inc.	Life Sciences Tools & Services	(28.0%)	0.88
MARA	Marathon Digital Holdings, Inc.	Software	63.7%	6.31	BDSI	BioDelivery Sciences International, Inc.	Pharmaceuticals	(22.7%)	0.40
CNS	Cohen & Steers, Inc.	Capital Markets	50.2%	4.62	IMNM	Immunome, Inc.	Biotechnology	(31.7%)	0.28
ENV	Envestnet, Inc.	Software	52.5%	4.56	FVE	Five Star Senior Living Inc.	Health Care Providers & Services	(27.7%)	0.13
RIOT	Riot Blockchain, Inc.	Software	57.0%	3.06	PFX	PhenixFIN Corporation	Capital Markets	(22.4%)	0.11
MKTY	Mechanical Technology, Incorporated	Electronic Equipment, Instruments & Components	54.4%	0.16	INTG	The InterGroup Corporation	Real Estate Management & Development	(29.5%)	0.10

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