CRYPTOCURRENCY MARKET ANALYSIS

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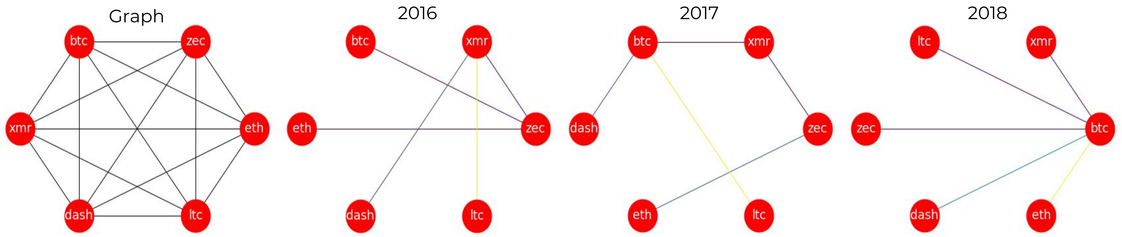
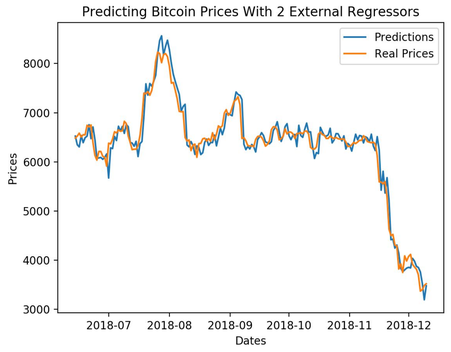
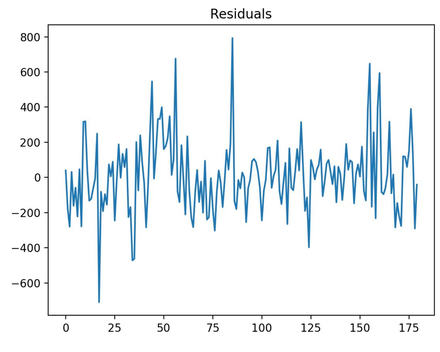
Important Currencies Through Time (Activity MST)



$$\text{activity}(u,v) = \frac{\text{traded quantity}(u,v)^2}{\text{marketcap}(u)\cdot\text{marketcap}(v)}$$

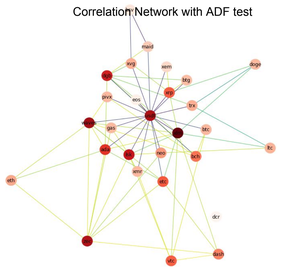
Predicting Bitcoin Prices with Recurrent Neural Networks

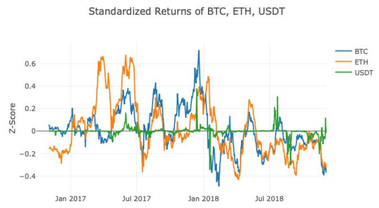




RNN trained to predict next-day price of Bitcoin using 30 day history of BTC, along with ETH and LTC as external regressors.

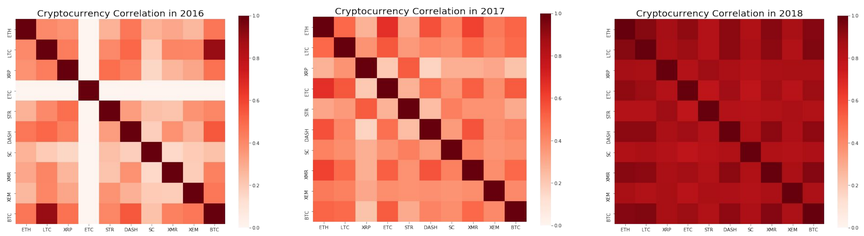
Evolution of Main Currency Correlations



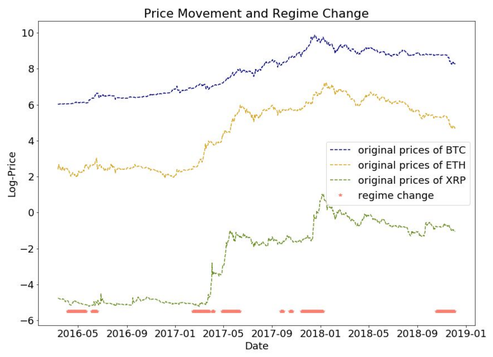


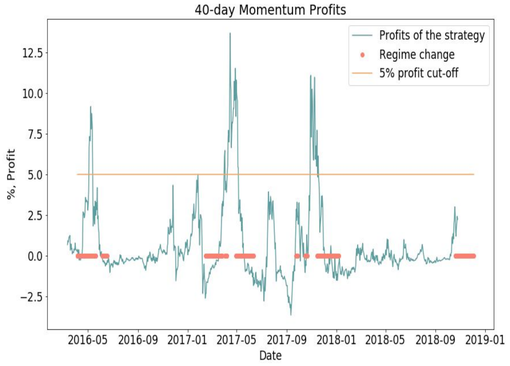
- Augmented Dickey–Fuller test to determine edge existence, with correlation edge weights.
- USDT has more relationship with other cryptocurrency. The USDT captured the peak of BTC and ETH

Uncorrelated behavior has become less prevalent since the crypto market crash in 2017.



Price Series and Trade Regimes

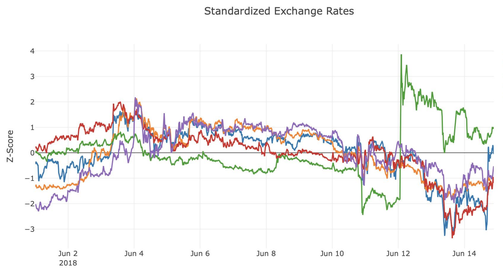


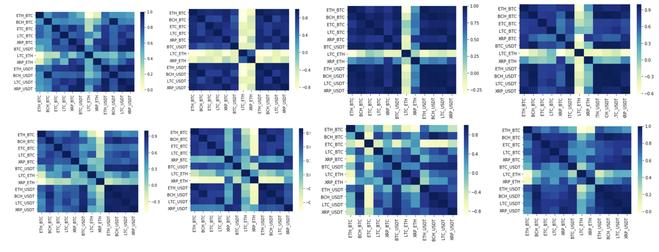


- Problematic train/test split (for ARMA, GP, etc.)
- Use 3 coins with biggest market cap to run test
- Detect regions of consistent behavior

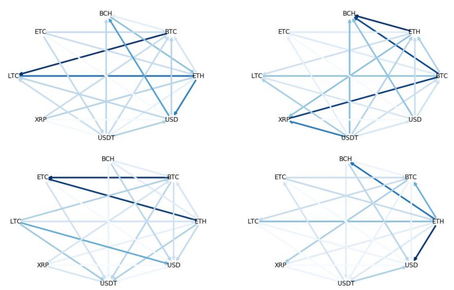
- Expect different profits for steady / chaotic regions
- Change of regime intervals correlated with profits

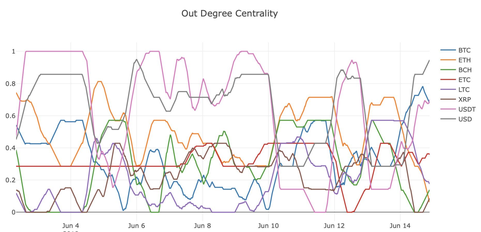
Intraday Analysis

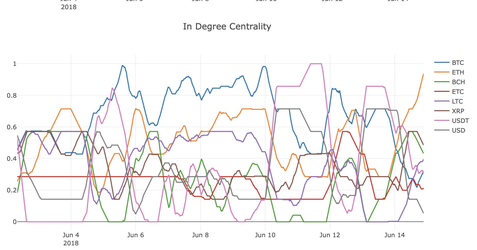




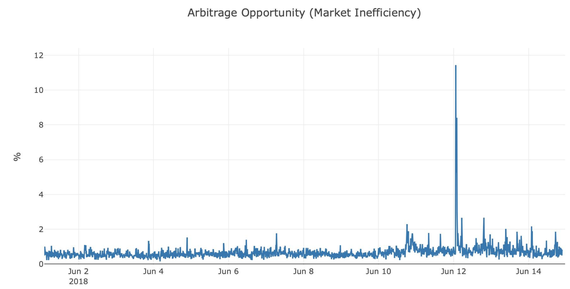
We used directed graphs to analyze value flows between cryptocurrencies. Edges are weighted by percent change times volume in ten-minute intervals.







We observe sudden flows in and out of some cryptocurrencies, spiked changes in the correlation matrix, and this behavior yields arbitrage opportunity via exchange rate cycles.



Conclusions

- Behavior among major cryptocurrencies has become less independent (more correlated) since the crash in early 2018.
- Periods between chaotic and stable price dynamics allow for profit opportunities
- Using other coins as external regressors can help improve Bitcoin price predictions.
- Dramatic intraday swings are evidence of market manipulation and yield arbitrage opportunities in “exchange circles”.