

# Asset Pricing on Blockchain: Slow moving capital, crypto-momentum, and bubbles

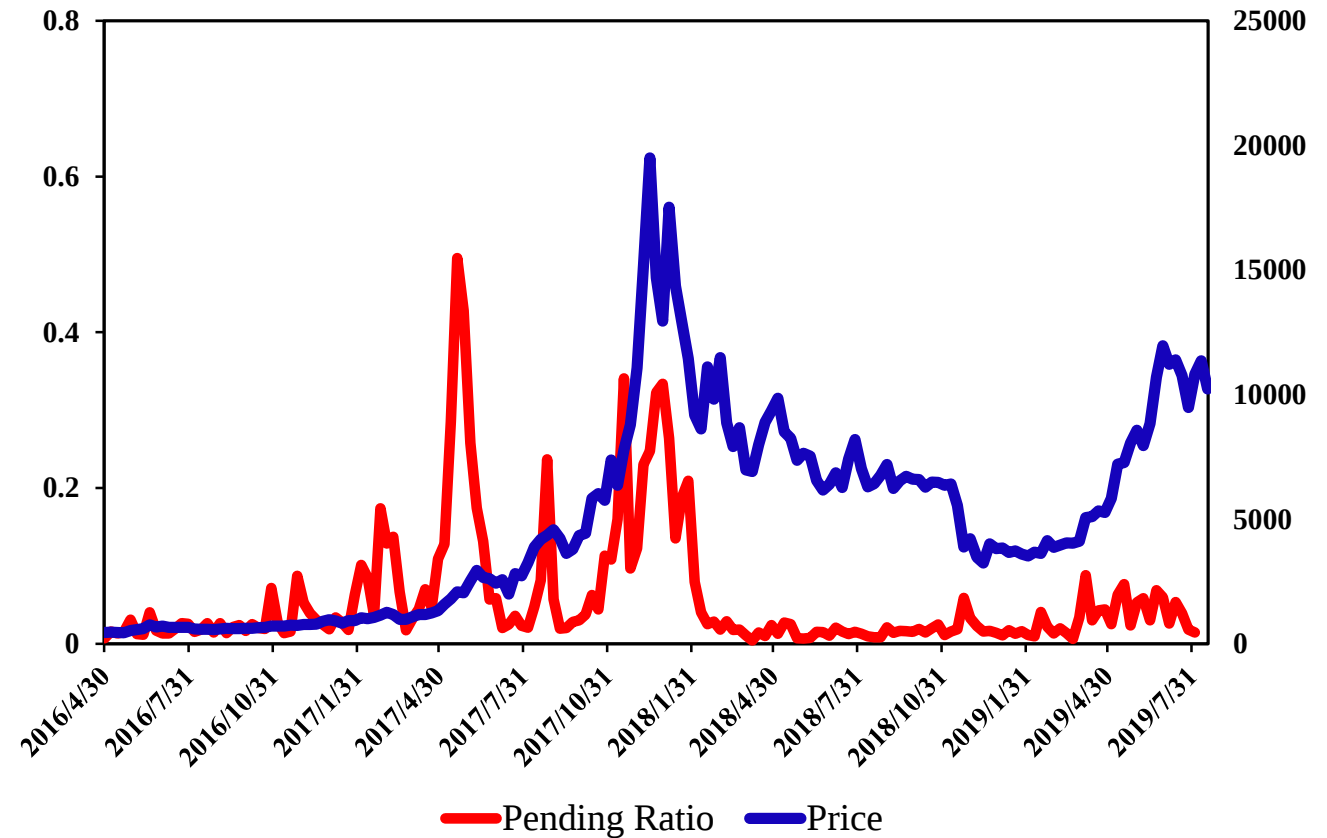
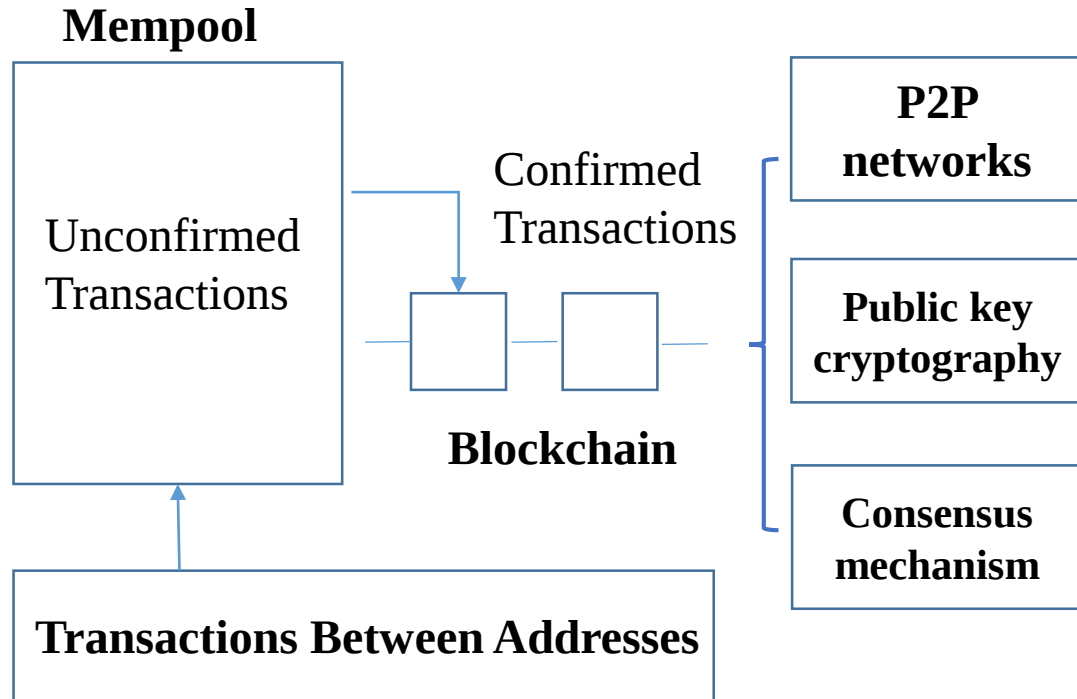
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Dec, 2019

# Motivation

## ➤ Slow Moving Capital on Bitcoin (Pending Transactions)



# Motivation

## ➤ Slow Moving Capital on Crypto Market vs Financial Market

Crypto Market

### ❑ Impediment Stage

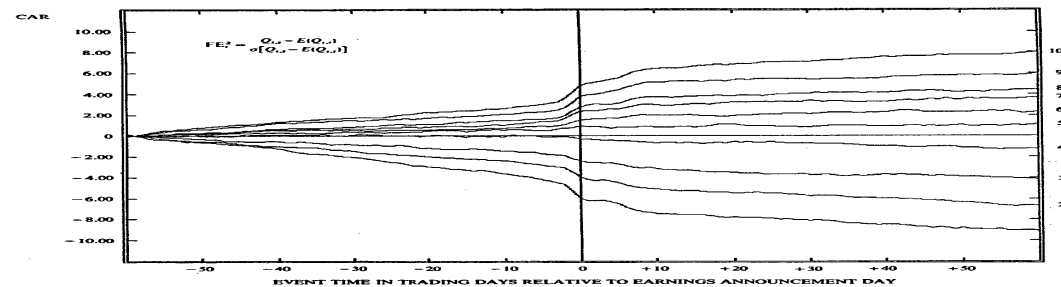
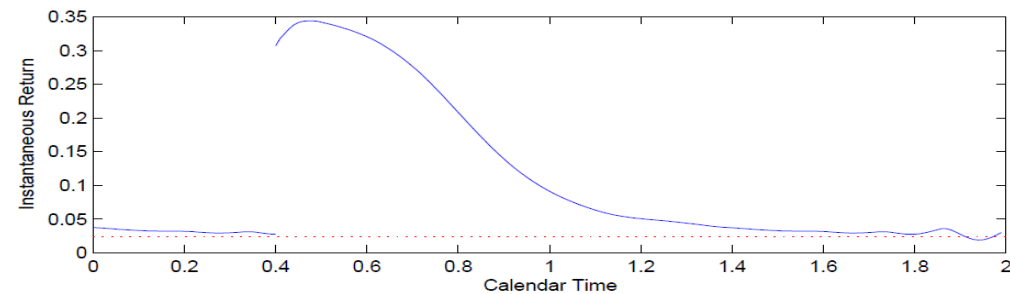
- ✓ Large Price Run-ups and Drawdowns
- ✓ Investor Preference Driven

### ❑ Normal Stage

- ✓ Slow Information Dissemination
- ✓ Momentum

Financial Market

Duffie, Garleanu, and Pedersen 2007, 2009: bubble and crash



# Roadmap

- Crypto Data
- Measure for Impediment Stage and Normal Stage
- Baseline Results
- Additional Analysis

## ➤ Trading Data

- Variables: Close Price, Marketcap (1392 Cryptos From May, 2013 to June 2018)
- Source: scraped from *Coinmarketcap*, *Yahoo!Finace*, *Cryptocompare*, *Coincheckup*

## ➤ Social Media Data

- Variables: Google Search Volume (1392 Cryptos From May, 2013 to June 2018)
- Source: <https://www.googletrends.com>

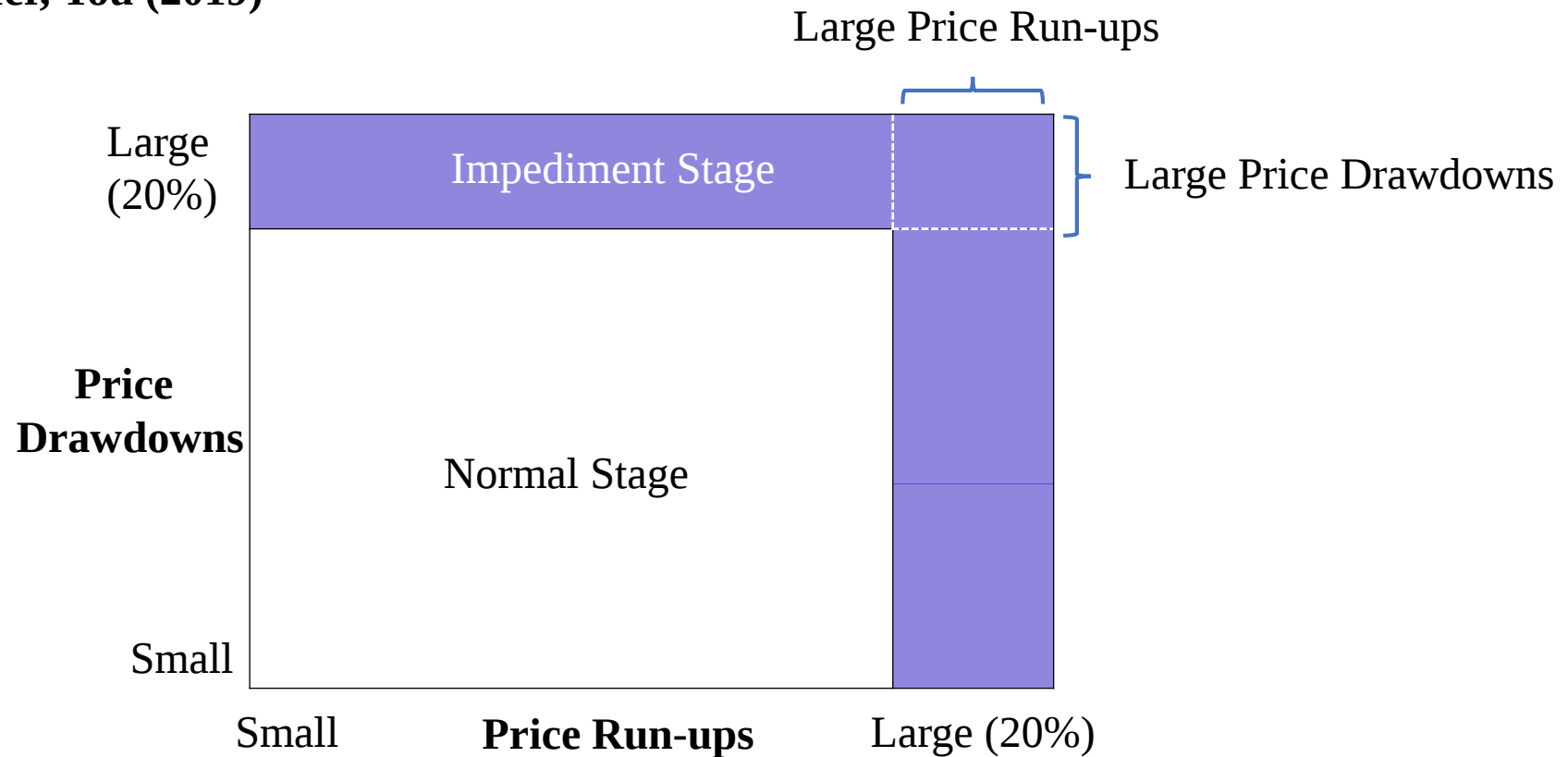
## ➤ Blockchain Data

- Variables: Pending Transactions, Total Transactions (Bitcoin, Litecoin, Ethereum, Dash, Bitcoin Satoshi Vision.....)
- Source: [www.blockchain.info](http://www.blockchain.info)

# Measure for Impediment Stage and Normal Stage

- Make a distinction between impediment stage and normal stage

Greenwood, Shleifer, You (2019)



# Baseline Results

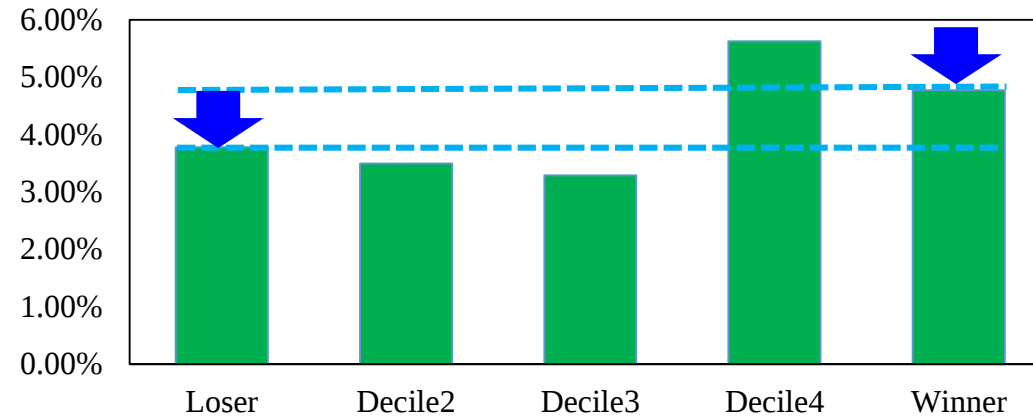
$$D_{i,t+1}(\text{large Price Runups}) = \alpha_0 + \beta_1 * D_{i,t}(\text{Impediment}) + \beta_2 * D_{i,t}(\text{Normal}) + \varepsilon_{it},$$

$$D_{i,t+1}(\text{large Price Drawdowns}) = \alpha_0 + \beta_1 * D_{i,t}(\text{Impediment}) + \beta_2 * D_{i,t}(\text{Normal}) + \varepsilon_{it},$$

| Panel Regression                   |                             |                      |                           |                     |                             |                      |
|------------------------------------|-----------------------------|----------------------|---------------------------|---------------------|-----------------------------|----------------------|
|                                    | $D_{T+1}$ (Large Drawdowns) |                      | $D_{T+1}$ (Large Runups ) |                     | $D_{T+1}$ (Large DD or RUs) |                      |
|                                    | Model 1                     | Model 2              | Model 3                   | Model 4             | Model 5                     | Model 6              |
| Intercept                          | 0.13***<br>(15.76)          | 0.32***<br>(30.18)   | 0.19***<br>(21.61)        | 0.24***<br>(21.98)  | 0.31***<br>(30.14)          | 0.53***<br>(41.45)   |
| $D_{i,t}(\text{Impediment Stage})$ | 0.18***<br>(13.63)          |                      | 0.05***<br>(3.57)         |                     | 0.22***<br>(13.22)          |                      |
| $D_{i,t}(\text{Normal Stage})$     |                             | -0.18***<br>(-13.63) |                           | -0.06***<br>(-3.57) |                             | -0.22***<br>(-13.22) |
| R-squared                          | 0.05                        | 0.05                 | 0.00                      | 0.00                | 0.05                        | 0.05                 |
| Observations                       | 3601                        | 3601                 | 3601                      | 3601                | 3601                        | 3601                 |

# Baseline Results

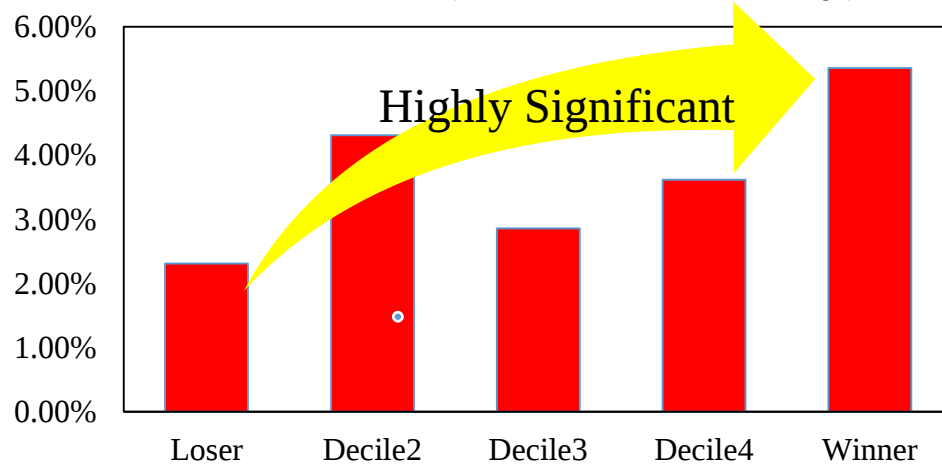
Outright MOM (WML= 1% weekly)



1% weekly,  
Insignificant

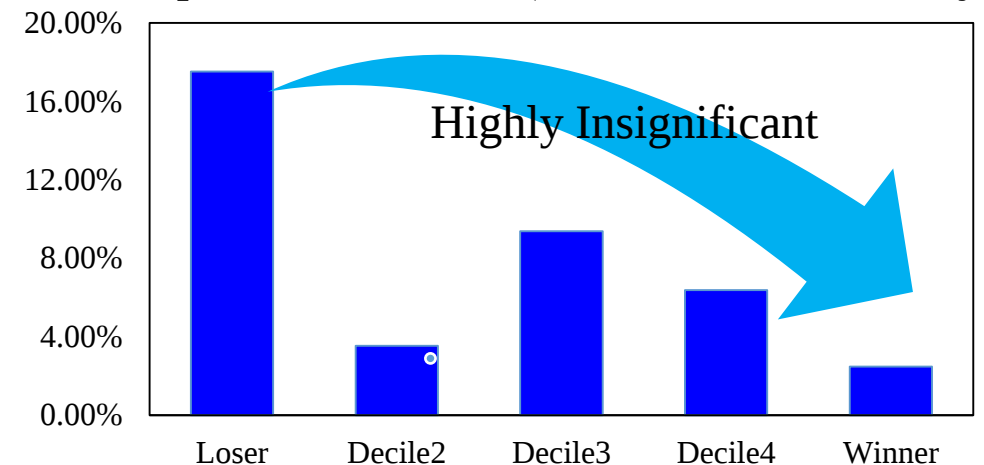
Average 2W-2W crypto-momentum

Normal Assets (WML = 3% weekly)



Normal-stage-crypto momentum

Impediment Assets (WML = -15% weekly)



Impediment-stage-crypto momentum

# Additional Analysis

## ➤ Momentum Crashes

### ➤ Daniel and Moskowitz (2016)

❑ Stock momentum performs well in bull market.

❑ Stock momentum crashes in bear market.

$$\tilde{R}_{WML,t} = (\alpha_0 + \alpha_B * I_{B,t-1}) + (\beta_0 + I_{B,t-1}(\beta_B + \tilde{I}_{U,t}\beta_{B,U})) * \tilde{R}_{Mkt,t} + \tilde{\epsilon}_t$$

Bear Market Indicator

❑ Does crypto momentum also crash in bear market?

Crypto momentum doesn't crash in bear market.

| Coefficient           | Variable                                    | Winner-Loser     |                  |                  |
|-----------------------|---------------------------------------------|------------------|------------------|------------------|
|                       |                                             | All              | Normal           | Bubble           |
| $\tilde{\alpha}_0$    | 1                                           | 0.07**<br>(2.10) | 0.07*<br>(1.93)  | 0.03<br>(0.59)   |
| $\tilde{\alpha}_B$    | $I_{B,t-1}$                                 | -0.02<br>(-0.26) | 0.03<br>(0.39)   | -0.11<br>(-0.99) |
| $\tilde{\beta}_0$     | $\tilde{R}_{Mkt,t}$                         | -0.03<br>(-0.27) | -0.05<br>(-0.51) | 0.02<br>(0.15)   |
| $\tilde{\beta}_B$     | $I_{B,t-1}\tilde{R}_{Mkt,t}$                | -0.39<br>(-0.46) | 0.18<br>(0.19)   | -1.89<br>(-1.59) |
| $\tilde{\beta}_{B,U}$ | $I_{B,t-1}\tilde{I}_{U,t}\tilde{R}_{Mkt,t}$ | -0.55<br>(-0.40) | -0.36<br>(-0.23) | 1.25<br>(0.66)   |
| $R_{adj}^2$           |                                             | -0.00            | -0.02            | 0.00             |

# Additional Analysis

## ➤ Investor attention and the formation of impediment stage

$$D_{i,t+1}(\text{Impediment Stage}) = \alpha + \beta_1 * \text{Google}_{i,t-1} + \beta_2 * \Delta\% \text{Google}_{i,t-1} + \beta_3 * M_{i,t-1} + \varepsilon_{i,t}$$

| Depandent Variable: $D_{i,t+1}(p = \text{Impediment Stage})$ |                    |                      |                    |                      |
|--------------------------------------------------------------|--------------------|----------------------|--------------------|----------------------|
| Variables                                                    | Model 1            | Model 2              | Model 3            | Model 4              |
| Google Search                                                | 0.001***<br>(5.23) | 0.001***<br>(9.48)   | 0.001***<br>(5.23) | 0.001***<br>(9.48)   |
| $\Delta\%$ Google Search                                     | 0.018***<br>(8.98) | 0.014***<br>(6.75)   | 0.018***<br>(8.98) | 0.014***<br>(6.75)   |
| Risk free rate                                               |                    | -1.43***<br>(-16.27) |                    | -1.43***<br>(-16.27) |
| Mkt-rf                                                       |                    | 0.005***<br>(3.68)   |                    | 0.005***<br>(3.68)   |
| Fixed effect                                                 | ICY                | ICY                  | ICY                | ICY                  |
| Crypto controls                                              | Yes                | Yes                  | Yes                | Yes                  |
| Week controls                                                | No                 | No                   | Yes                | Yes                  |
| Observations                                                 | 23365              | 23365                | 23365              | 23365                |
| AdjRsqr                                                      | -2.16%             | -0.71%               | -2.16%             | -0.71%               |

# Robustness Check

- Different ranking/holding horizon
- Top 500 largest marketcap coins
- Post-EOS periods

# Conclusion

- Blockchain => Limited capacity in processing transactions => Slow moving capital.
- Crypto impediment stage vs normal stage.

|                  | Run-ups & Drawdowns | Momentum |
|------------------|---------------------|----------|
| Impediment Stage | ✓                   | X        |
| Normal Stage     | X                   | ✓        |

- Slow moving capital provides an pricing foundation for blockchain-based assets.

Thank you!  
Questions are welcome!

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