



Are cryptocurrencies the future of financial fraud?

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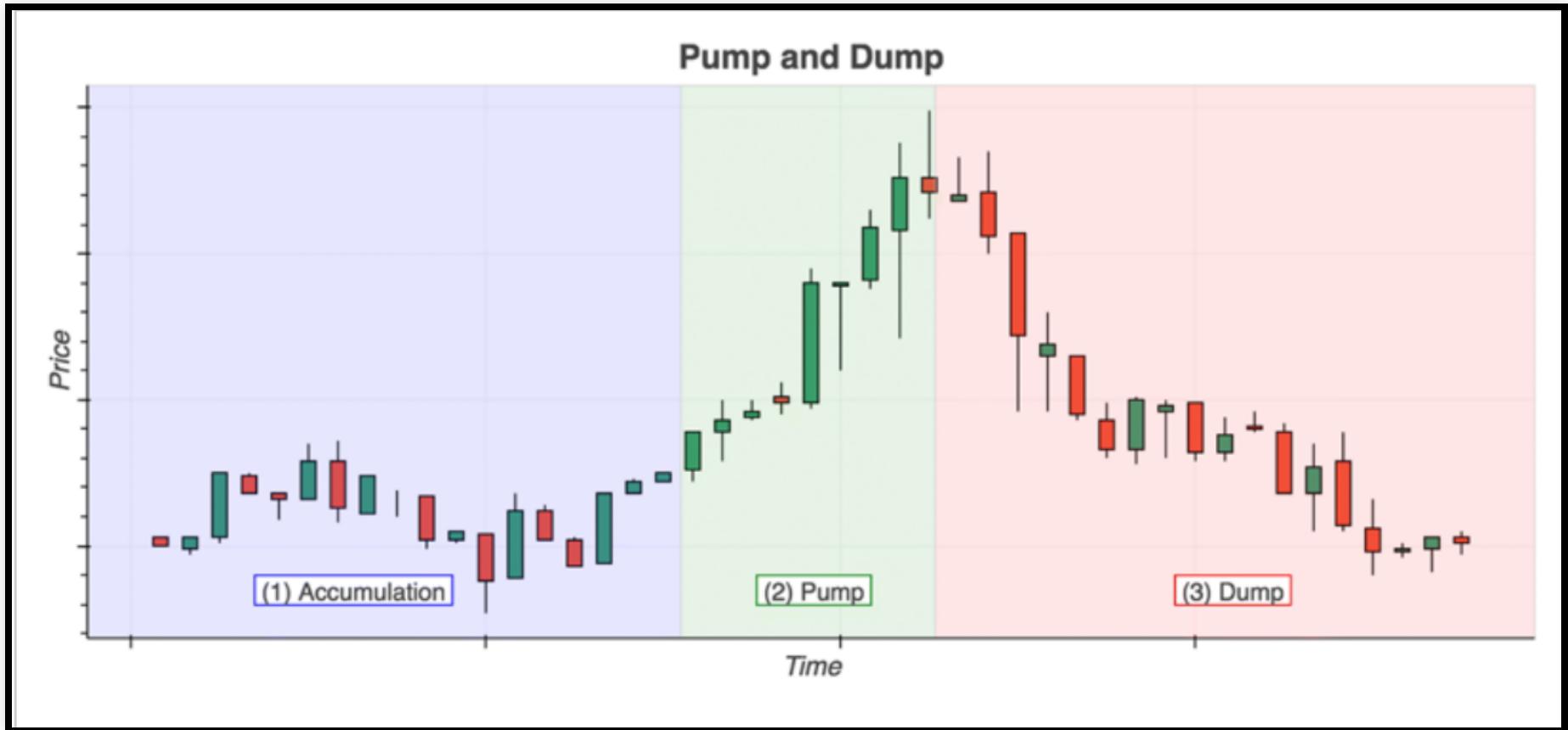
Dawes Centre for Future Crime

University College London

Actieuse NACHT-WIND-Zanger met zyn Tover Slons



Anatomy of a P&D

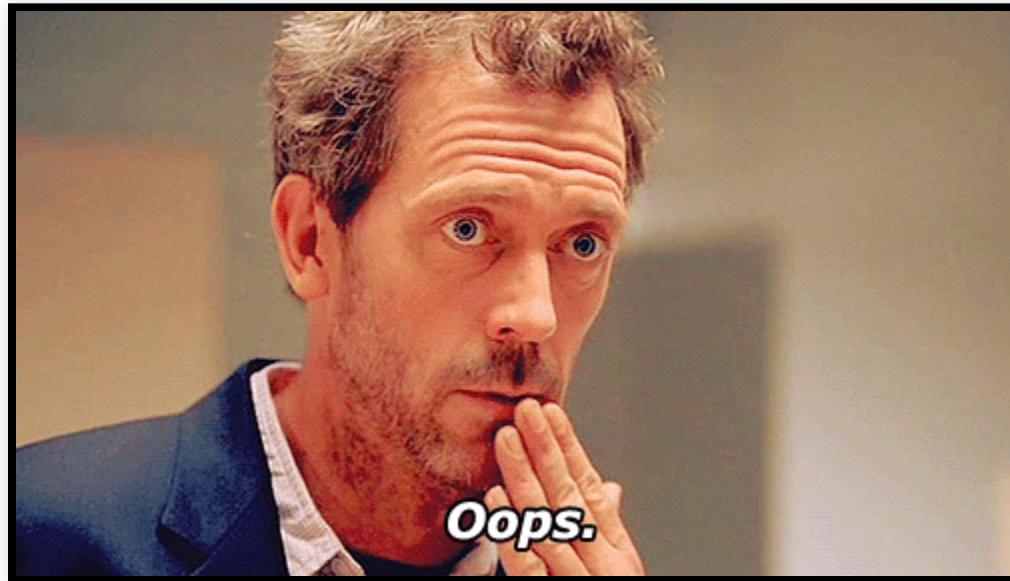


The three phases of a pump-and-dump ([Kamps & Kleinberg, 2018](#))

2 things happened

1. The Internet
2. Cryptocurrencies

What could go wrong?



The recent explosion of nearly 2,000 cryptocurrencies in a largely unregulated environment has greatly expanded the scope for abuse.

Hamrick et al., 2018

The story of OfficialMcAfee and OfficiallMcAfee.

from: Mac & Lytvynenko, Buzzfeed, 2018

Coin of the day ...

When the tweet was first broadcast at around 3 p.m. ET, GVT was bought and sold on the market at \$30.

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By 3:04, it was at \$45, and trading volume had doubled.

But by 3:19, GVT's price had fallen back to \$30.

Morale of the story

The smart money – the early money – had gotten out, leaving the late money holding a bag of now-diminished value.

Crypto P&Ds

Old challenges	New challenges
low market cap	faster time scale (near real-time)
lack of reliable information	broader spread of misinformation
low price	new vehicles for “rumours”

Yes, yes, yes... but what do I care?

“It’s just another problem”

A problem with \$ involved

- \$50m (Onecoin)
- \$825m over six months
- **\$222m for a single group**

The “grey zone” problem

 Rocket pump 🚀
43383 members

 Rocket pump 🚀
FREE FOR ALL BIG PUMP

 Less than 1 hours remaining for Binance Pump! 

Over 200K Participants.
💰 Huge pump . 💰
Time: 15.00 UTC Today

 Rocket pump 🚀
 30 MINUTES LEFT!! 

TARGET : 15% PROFIT! 
Time: 15 GMT. 
DATE : 16 MAY 2018

LETS ROCK BINANCE TODAY!

 Rocket pump 🚀
 30 MINUTES LEFT!! 
LOGIN TO BINANCE AND BE READY

 Rocket pump 🚀
 NEXT POST IS COIN!! 
!! BINANCE HIGH ALERT !!

 Rocket pump 🚀
COIN IS  YOYO 

721 ⏱ 16:24

661 ⏱ 16:27

601 ⏱ 16:48

541 ⏱ 16:55

14:00 15:00 16:00 17:00 18:00



Pump evident {

} Hype and Suspense Building

} Coin announced

Can we detect P&Ds?

Data

- scraped cryptocurrency exchange data
- trading data of 1-h granularity
- 20 days of trading, 5 exchanges, 977 trading pairs

Data + code available at <https://osf.io/827wd/>

Criteria for P&Ds

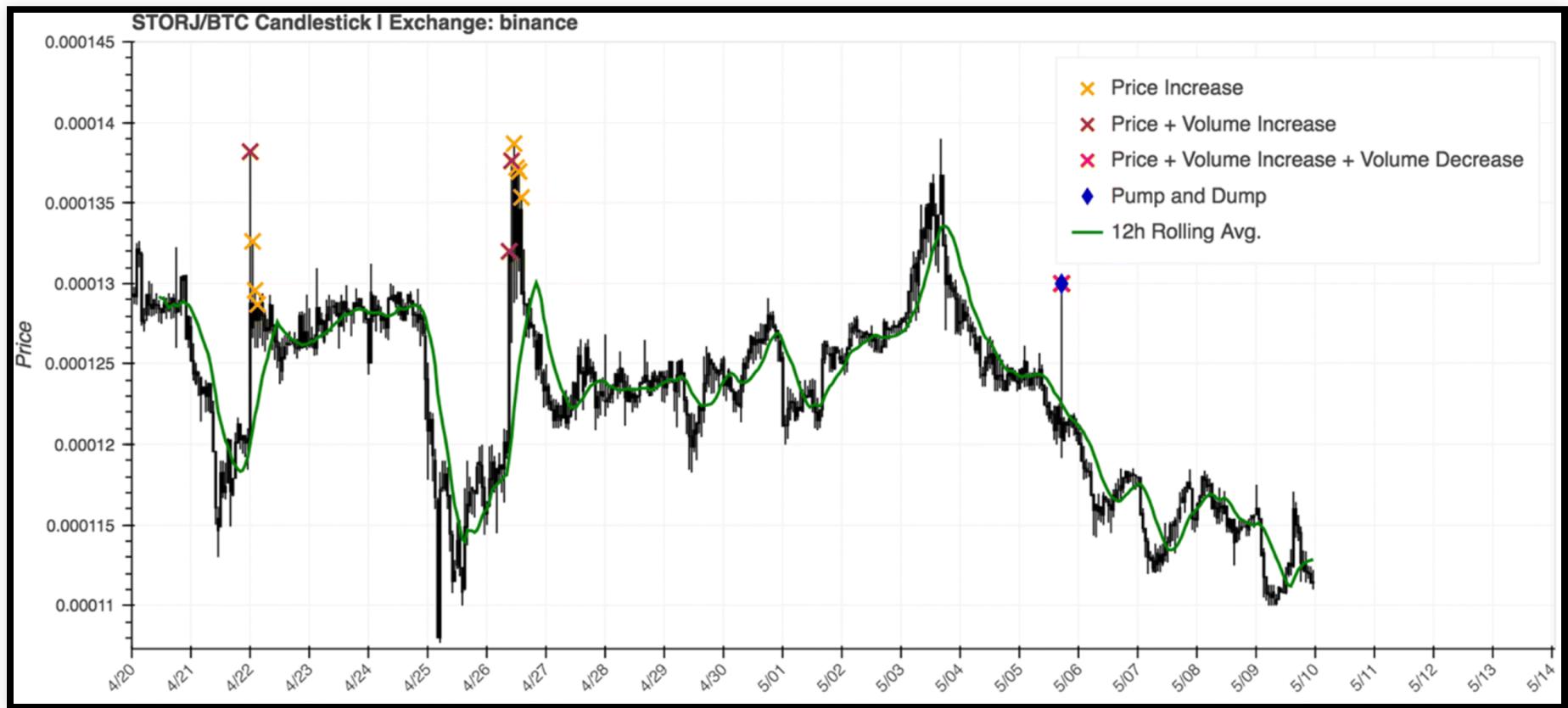
- sudden price increase (PUMP)
- sudden volume increase (PUMP)
- marked price drop (DUMP)

Conditional local point anomaly detection

Anomalie parameters

	Balanced parameters
Estimation window	12h
Volume increase	300%
Price increase	5%
Price drop	1.00 SD
Alleged pumps	2150
Pump-and-dumps	1617
Crypto/crypto	97.0%
Low market cap	81.8%

P&D detection



Findings

- potential for detectability
- mainly crypto/crypto pairs
- mostly low market cap

Intermezzo: situational crime prevention

- away from the criminological-sociological model
- away from the “individual-centric” model
- fraud/crime as a complex problem
- ... embedded in a situation
- robust effect: clustering

What does this mean for cryptocurrency?

- understanding the *P&D situation*
- Does clustering occur?

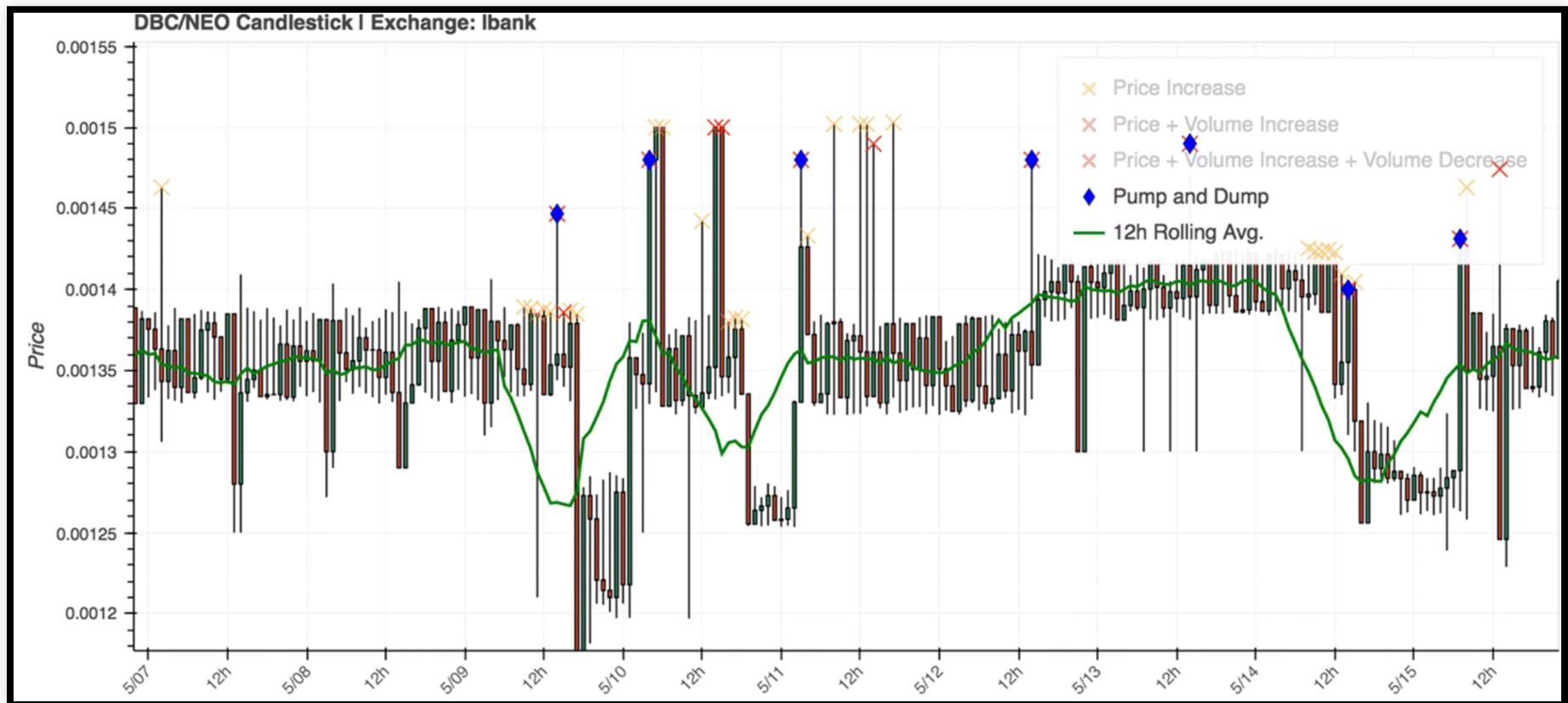
Zooming in

- Exchange-level
 - % of traded coins \neq % of P&Ds
 - Some exchanges are used more often than others
 - e.g. “Kraken”: 6% of traded coins, < 1% of P&Ds
 - among most regulated marketplaces

Zooming in

- Coin-level
 - Most are never targeted
 - Some are targeted again and again
 - 30% of coins ~ 80% of P&Ds

Repeat victimisation of coins



Core findings

- potential for detectability
- mainly crypto/crypto pairs
- mostly low market cap
- **repeat exchange victimisation**
- **repeat coin victimisation**
- no evidence for “*Bitcoin is not immune from the pump-and-dump phenomenon*” (Hamrick et al., 2018)

In context

- P&D groups successful in pumping the price
- (very) short timeframe
- Telegram and Discord used for organising and coordination

see Kamps & Kleinberg, 2018; Xu & Livshits, 2018; Hamrick et al., 2018; Li et al., 2018

Maybe there's more to the coins...

High-potential coins and coin malleability

Kamps & Kleinberg, forthcoming

Arguably, the decision to choose one coin for a pump-and-dump scheme and not another are not random but rather subject to cost-benefit processes.

[...] if one is targeting a coin for a P&D, it is useful to be able to manipulate a coin's price as much as possible, while using the least amount of capital

Coin malleability

“the percentage price increase that a coin would experience,
with respect to a certain amount of volume injected”

- data
 - 239 x/BTC pairs
 - scraped in April 2019
- levels of BTC injection
 - 0.25 BTC (~ \$1,300)
 - 1.00 BTC (~ \$5,100)
 - 5.00 BTC (~ \$25,500)
 - 10.00 BTC (~ \$51,000)

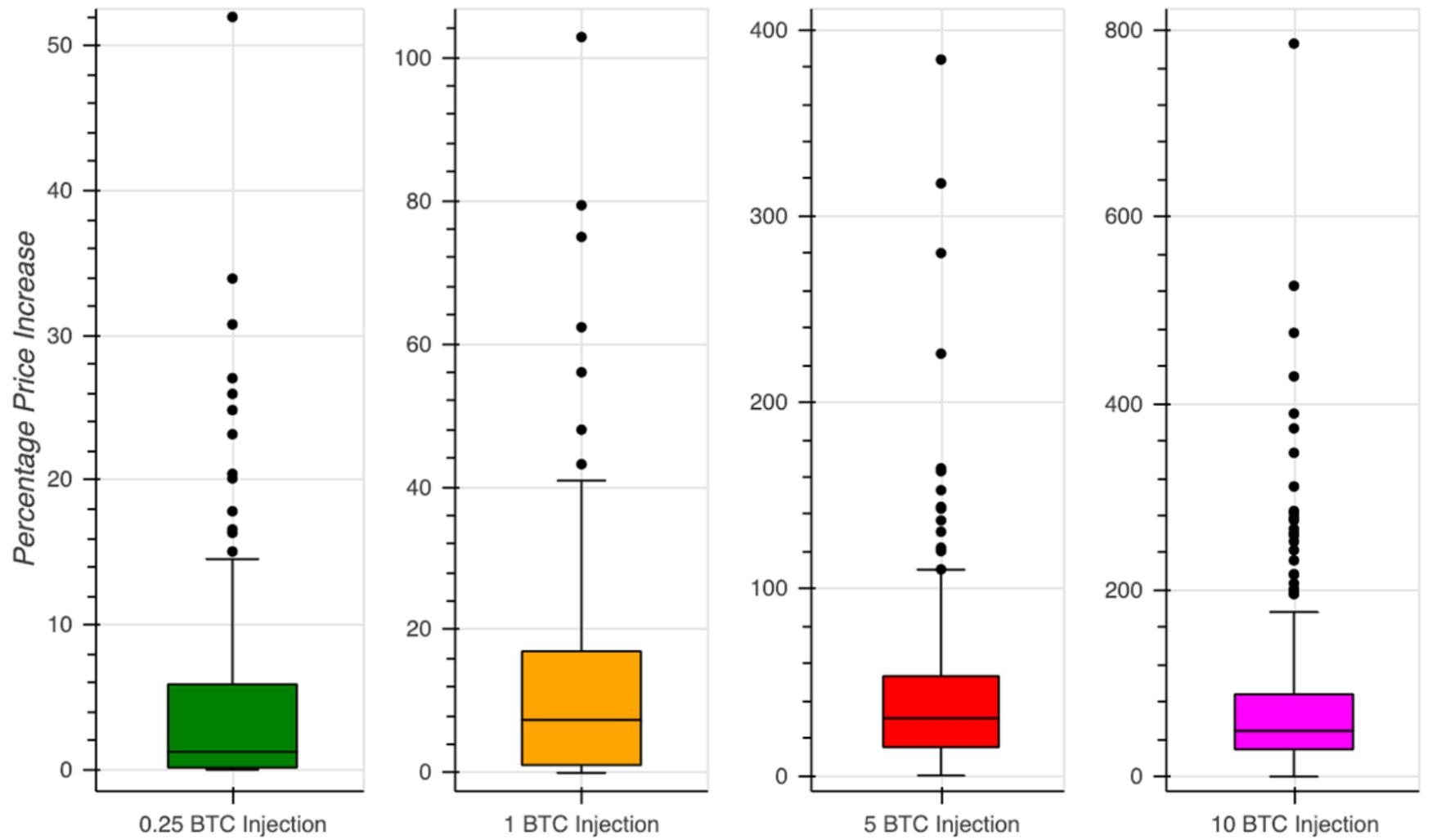


Figure 3. Tukey style boxplots of the price increase for 0.25, 1, 5, and 10 BTC injections
Outliers are defined as 1.5x the IQR. Note the scale change on the y-axis.

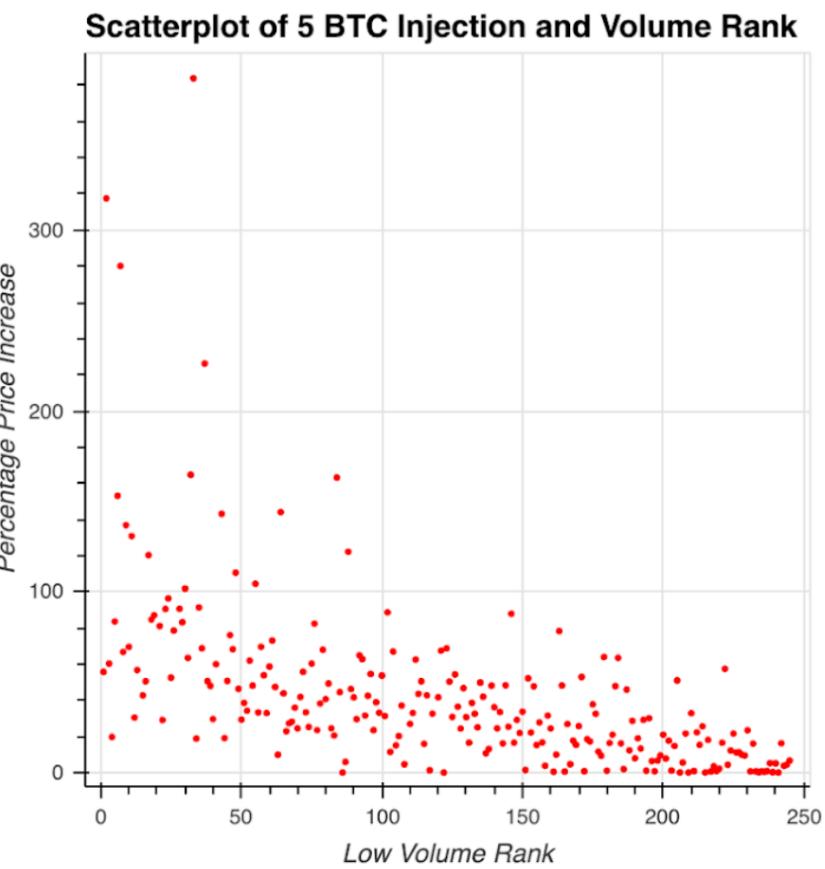
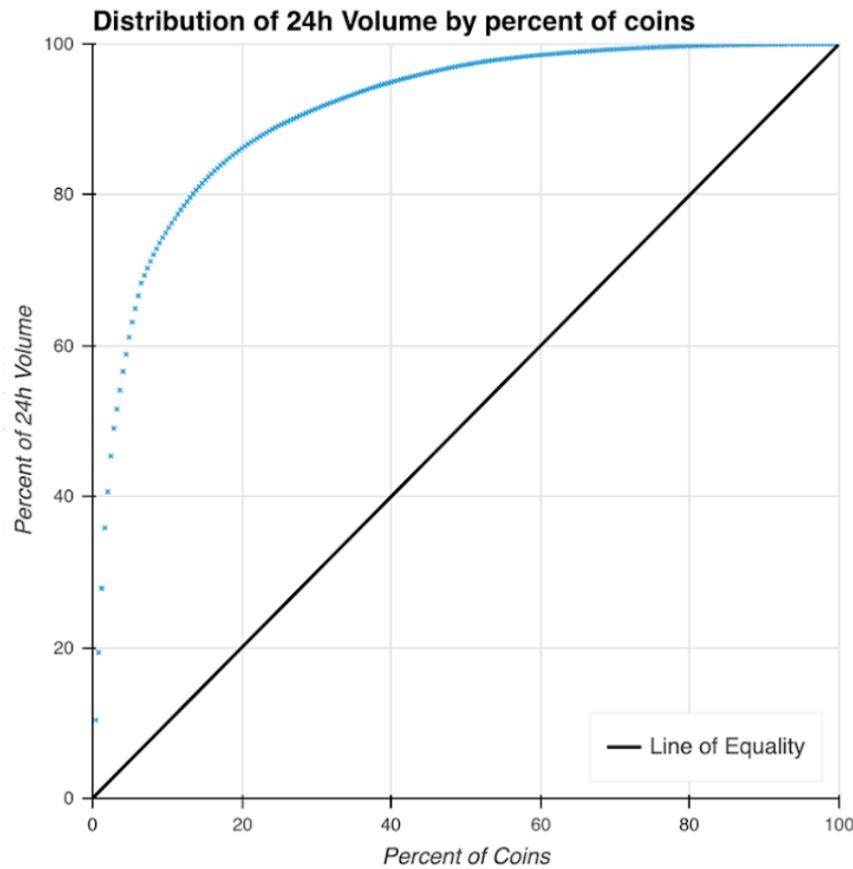


Figure 4.

Left: Lorenz curve demonstrating the percentages of coins making up the 24h volume

Right: Scatterplot of the percentage price increase of a 5 BTC injection versus the low volume rank

Key findings on coin malleability

Not all coins are equal!

- some coins are more malleable than others
- trading volume highly clustered
- malleability not identical to low volume
- possible explanation: too low volume doesn't do the trick!

Vision on research & bigger picture

Old-school approach

1. detection
2. prevention

Circular problem.

Ongoing research

- Detection:
 - (Weak) signals in the accumulation phase
 - (Weak) signals in the pump phase
- Anticipation:
 - Changes in MO
 - Transition to new targets (coins)

Interdisciplinary challenge!

Pump and Dump



New problems

- Twitter impersonations
- New means to spread information
- Transactions in milliseconds

New questions

- trust
 - how do groups maintain internal trust?
 - how do they punish?

New questions

- trust
- decision-making processes
 - how are targets chosen?
 - what is the cost-benefit process?
 - what do we not see?

Situational prevention

- does displacement happen?
 - how?
 - where to?

Vision on research

1. collaboration between universities, fintech, government, banks, “citizen science”

Dead Coins

[ADD A DEAD COIN](#)[SIGN UP](#)

A B C D E F G H I J K L M N O P Q R S T U V W X Y Z

Coin Name	Coin Code	Summary	Link	Category	Share
EOS	EOS	EOS is not a blockchain. Whiteblock calls it a distributed ...	eos.io	Scam	Share
UltraPay Coin	UPC	Suspicions early of an exit scam for this "pyramid" Masternode ...	ultrapay.info	Scam	Share
byteball	byteball	Dead mean dead		Scam	Share
Graphgrail	GAI	Russian ICO that raised about 1 million dollars, and then ...	graphgrail.com	Scam	Share
ucoincash	ucoin	Can not login to their homepage anymore.	sficoins.co	Scam	Share

Vision on research (unrealistic but cool)

2. infiltration of P&D groups
3. own P&D

Are cryptocurrencies the future of financial fraud?

Yes ~~Maybe~~ Probably ~~No~~

What do we not know?

What are the challenges for the future?

10th + 11th June, Crypto-fraud “sandpit”

End.

Credits to the team: Josh Kamps, Florian Hetzel.

Research | Open Access

To the moon: defining and detecting cryptocurrency pump-and-dumps

Josh Kamps and Bennett Kleinberg  

Crime Science An Interdisciplinary Journal 2018 7:18

<https://doi.org/10.1186/s40163-018-0093-5> | © The Author(s) 2018

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