Analyzing the Bitcoin Ponzi Scheme Ecosystem

Marie Vasek and Tyler Moore
There’s No Free Lunch, Even Using Bitcoin: Tracking the Popularity and Profits of Virtual Currency Scams

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Abstract. We present the first empirical analysis of Bitcoin-based scams: operations established with fraudulent intent. By amalgamating reports gathered by voluntary vigilantes and tracked in online forums, we identify 192 scams and categorize them into four groups: Ponzi schemes, mining scams, scam wallets and fraudulent exchanges. In 21% of the cases, we also found the associated Bitcoin addresses, which enables us to track payments into and out of the scams. We find that at least $11 million has been contributed to the scams from 13,000 distinct victims. Furthermore, we present evidence that the most successful scams depend on large contributions from a very small number of victims. Finally, we discuss ways in which the scams could be countered.

1 Introduction

An effective, though unfortunate, way to determine that a new technological platform has “arrived” is by observing the presence of scammers leeching off those using the system. Shortly after the advent of the telegraph, sneaky punters began placing bets on recently-completed horse races at faraway bookmakers who had not yet observed the result [1]. Once telephones became pervasive, unsolicited calls by scammers became problematic. No sooner had email become popular, then a flood of messages promising riches from Nigerian princes began filling people’s inboxes.
The Badbitcoin Project
Exposing bitcoin and cryptocurrency frauds since Feb 2014

If you have never read it, then a great place to begin your bitcoin adventure is by reading the very original White Paper, from Satoshi Nakamoto. This explains the concept of bitcoin, and why so many people work so hard to progress this disruptive technology.

When you understand the potential of bitcoin, you will also understand why so many people want it from you. The future value is much debated, but with consensus saying that it has a very long way to go before becoming any kind of bubble.

Bitcoin is not a ponzi, and is not a scam. It's value is derived from it's raw cost of production, and value as a functioning token of trade, and store of value. The blockchain is supported by the transaction fees of the miners who do the work. The world of financial fraud is not the same as the world of financial freedom.
**Leancy has not been paying since 03/11/14. No admins could be reached. Do not deposit any funds into Leancy.**

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**Re: Leancy Ltd - Invest w/ Bitcoins 150% Yields**
February 04, 2014, 09:48:58 AM

**PORTALS**
Facebook Group (Leancy Investors) - A place (free of spam) for honest discussions regarding Leancy and other HYIPs and it's illegal operations as well as news and updates regarding any information on those behind the scams.

Skype Room - Unfortunately, bitcointalk isn't displaying the link properly so if you want to join, you'll have to add the Skype user: *leancybtc* and include in the request message you're from bcttalk. This chat room has the same intent as the FB group above.

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**Re: Leancy Ltd - Invest w/ Bitcoins 150% Yields**
February 04, 2014, 12:40:06 PM

Quote from: LeancyBTC on February 04, 2014, 09:48:58 AM

Food for thought - The average accrued earnings from my investment portfolio is $212 per day. If I were to convert that to mining, it would require a 1.15T/s mining power to accumulate the same return at today's current difficulty. However, compared to mining; I'm not weighed down by the cost of electricity and the time required to break even on the hardware investment.

You are, however, weighed down by the risk that this site can one day shut its doors and go to the Bahamas. And the question, as it's the case with all HYIPs, isn't "if" but "when".

I just hope it won't happen this month.
Profits of Ponzi

Daily payments into and out of Bridge HYIPs

- Payments in (all Bridge HYIPs)
- Payments out (all Bridge HYIPs)

Payments in:
- Rockwell Partners
- Minimalism10
- Twelverized
- Leancy
- Ro Invest
- Fin Mutual
- Bitcoin Arbs
- Craigslist Investment
- cryptory
2015 Paper: Conclusions

- Developed manually intensive methodology for measuring profits of Bitcoin scams
- Found $11 million revenue over 42 scams
- Indirect harm from scams — undermine trust in the Bitcoin ecosystem
Measuring the Supply and Demand for Bitcoin Scams

GET 100X BITCOIN INVESTMENT IN 24 HOURS

GET 100X BITCOIN INVESTMENT IN 24 HOURS
March 30, 2015, 04:15:31 PM

GET 100X BITCOIN INVESTMENT IN 24 HOURS
http://bitcoin-profit.site.bz

Re: GET 100X BITCOIN INVESTMENT IN 24 HOURS
November 19, 2015, 05:25:43 AM

I did sent 0.2 and I got nothing back!!!

Status: 171 confirmations
Date: 11/17/15 20:52
To: 100x 19BtphFr6kWqYyqoAmSv5d2TZ4uwH56dCd
Debit: -0.20000000 BTC
Transaction fee: -0.00004070 BTC
Net amount: -0.20004070 BTC
Data Collection
Methodology

• Crawled 11,424 threads on the three subforums of bitcointalk.org:
  • Scam accusations
  • Gambling: Games and Rounds
  • Gambling: Investment Games
• Refined this further to find 1,780 scams advertised through 1,804 ponzi-registered domains as well as 1,448 Bitcoin addresses collated from 2,617 threads.
Lifetime of Scams
Scammer Interaction

Survival Probability

Days on Forum
Identifying shills

- Shills: users which we believe are the attacker under a different name

- Finding ground truth on shills: manually inspect threads, look for unusually positive posters & strong but false or unverifiable information

- Use forum history (only posts about one scam) to identify most of these users
Shill Interaction

Survival Probability

Days on Forum

- Only initial posting
- shill >0.10 of the comments
- scammer >0.10 of the comments
- scam or shill >0.25 of the comments
Scammer Forum History

- **Lifetime of Scams**
  - Days on Forum
  - Survival Probability

- **Old account**
- **Same day account**

- **Only One Scam**
- **Only on Scam Posts**
- **General Posting**

Graphs showing survival probability over days on forum for different categories.
Ponzi Victims over Time

- Within a day
- 1 day
- 2–7 days
- 8–14 days
- 15–21 days
- 22–28 days
- 29–56 days
- 57–112 days
- >113 days
Forum History of Ponzi Victims

<table>
<thead>
<tr>
<th>Category</th>
<th># Victim Posts</th>
<th># Other Posts</th>
<th>Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>Altcoins (all)</td>
<td>32,536</td>
<td>54,290,022</td>
<td>(-)</td>
</tr>
<tr>
<td>Alternative Clients</td>
<td>106</td>
<td>54,159</td>
<td>(-)</td>
</tr>
<tr>
<td>Bitcoin Discussion</td>
<td>8,872</td>
<td>998,246</td>
<td>(+)</td>
</tr>
<tr>
<td>Development &amp; Technical Discussion</td>
<td>683</td>
<td>162,405</td>
<td>(-)</td>
</tr>
<tr>
<td>Group Buys</td>
<td>498</td>
<td>84,734</td>
<td></td>
</tr>
<tr>
<td>Hardware</td>
<td>2,730</td>
<td>518,728</td>
<td>(-)</td>
</tr>
<tr>
<td>Mining</td>
<td>427</td>
<td>1,044,148</td>
<td>(-)</td>
</tr>
<tr>
<td>Mining software (miners)</td>
<td>274</td>
<td>67,561</td>
<td>(-)</td>
</tr>
<tr>
<td>Mining speculation</td>
<td>616</td>
<td>63,071</td>
<td>(+)</td>
</tr>
<tr>
<td>Pools</td>
<td>885</td>
<td>177,985</td>
<td>(-)</td>
</tr>
<tr>
<td>Press</td>
<td>696</td>
<td>74,437</td>
<td>(+)</td>
</tr>
<tr>
<td>Project Development</td>
<td>1,526</td>
<td>137,245</td>
<td>(+)</td>
</tr>
<tr>
<td>Technical Support</td>
<td>586</td>
<td>58,952</td>
<td>(+)</td>
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<tr>
<td>Auctions</td>
<td>1,865</td>
<td>108,048</td>
<td>(+)</td>
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<tr>
<td>Collectibles</td>
<td>1,063</td>
<td>60,745</td>
<td>(+)</td>
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<tr>
<td>Computer hardware</td>
<td>1,462</td>
<td>118,584</td>
<td>(+)</td>
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<tr>
<td>Currency exchange</td>
<td>3,124</td>
<td>138,264</td>
<td>(+)</td>
</tr>
<tr>
<td>Digital goods</td>
<td>7,303</td>
<td>277,903</td>
<td>(+)</td>
</tr>
<tr>
<td>Economics</td>
<td>3,692</td>
<td>1,204,450</td>
<td>(-)</td>
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</table>
Forum History of Ponzi Victims

<table>
<thead>
<tr>
<th>Category</th>
<th>Subcategory</th>
<th>1st Year</th>
<th>2nd Year</th>
<th>Change</th>
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</thead>
<tbody>
<tr>
<td>Gambling</td>
<td>12070</td>
<td>1297038</td>
<td>(+)</td>
<td></td>
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<tr>
<td>Gambling discussion</td>
<td>5677</td>
<td>340593</td>
<td>(+)</td>
<td></td>
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<tr>
<td>Games and rounds</td>
<td>23331</td>
<td>388689</td>
<td>(+)</td>
<td></td>
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<tr>
<td>Goods</td>
<td>1251</td>
<td>587681</td>
<td>(-)</td>
<td></td>
</tr>
<tr>
<td>Investor-based games</td>
<td>15402</td>
<td>115454</td>
<td>(+)</td>
<td></td>
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<tr>
<td>Lending</td>
<td>3230</td>
<td>138108</td>
<td>(+)</td>
<td></td>
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<tr>
<td>Marketplace</td>
<td>517</td>
<td>5372844</td>
<td>(-)</td>
<td></td>
</tr>
<tr>
<td>Micro Earnings</td>
<td>3694</td>
<td>144797</td>
<td>(+)</td>
<td></td>
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<tr>
<td>Scam Accusations</td>
<td>4643</td>
<td>116151</td>
<td>(+)</td>
<td></td>
</tr>
<tr>
<td>Securities</td>
<td>1338</td>
<td>202813</td>
<td></td>
<td></td>
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<tr>
<td>Service Announcements</td>
<td>2338</td>
<td>288993</td>
<td>(+)</td>
<td></td>
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<tr>
<td>Service Discussion</td>
<td>3692</td>
<td>330535</td>
<td>(+)</td>
<td></td>
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<tr>
<td>Services</td>
<td>8528</td>
<td>407342</td>
<td>(+)</td>
<td></td>
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<tr>
<td>Speculation</td>
<td>5058</td>
<td>883584</td>
<td>(-)</td>
<td></td>
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<tr>
<td>Trading Discussion</td>
<td>1678</td>
<td>257930</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Local (all)</td>
<td>14932</td>
<td>4454405</td>
<td>(-)</td>
<td></td>
</tr>
<tr>
<td>Archival</td>
<td>1026</td>
<td>147836</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Beginners &amp; Help</td>
<td>3923</td>
<td>564720</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Meta</td>
<td>1960</td>
<td>134319</td>
<td>(+)</td>
<td></td>
</tr>
<tr>
<td>Off-topic</td>
<td>8309</td>
<td>563710</td>
<td>(+)</td>
<td></td>
</tr>
<tr>
<td>Politics &amp; Society</td>
<td>2181</td>
<td>290782</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Cox Proportional Hazards Model

• Lots of measurable variables seem to affect lifetime — but which variables are responsible?

• A proportional hazards model lets us disentangle the effects of various measures on lifetime.

  • Dependent variable: lifetime

  • Independent variables: explanatory factors
Cox Proportional Hazards Model: Independent Variables

- **daily # victim comments**
  - Number of victim comments over the lifetime of the scam.

- **daily # scammer comments**
  - Number of scammer comments over the lifetime of the scam.

- **shill has posted?**
  - True if a “shill” has posted anywhere in the thread. (30% of the time)

- **same day account**
  - True if the scammers’ bitcointalk account was registered the same day as the original post for the scam. (43% of the time)
# Cox Proportional Hazards Model: Results

<table>
<thead>
<tr>
<th><strong>Daily # victim comments</strong></th>
<th><strong>Daily # scammer comments</strong></th>
<th><strong>Shill has posted?</strong></th>
<th><strong>Same day account</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>coef</td>
<td>exp(coef)</td>
<td>95% CI</td>
<td>p value</td>
</tr>
<tr>
<td>0.028</td>
<td>1.029</td>
<td>(1.022, 1.036)</td>
<td>&lt;&lt;0.0001</td>
</tr>
<tr>
<td>0.022</td>
<td>1.022</td>
<td>(1.002, 1.043)</td>
<td>0.034</td>
</tr>
<tr>
<td>-0.846</td>
<td>0.429</td>
<td>(0.385, 0.479)</td>
<td>&lt;&lt;0.0001</td>
</tr>
<tr>
<td>0.374</td>
<td>1.1453</td>
<td>(1.320, 1.599)</td>
<td>&lt;&lt;0.0001</td>
</tr>
</tbody>
</table>

Log-rank test: \( Q=4389.2, \ p<<0.0001, \ R^2 = 0.218 \)
Conclusions

• Developed semi-automated methodology for finding Bitcoin Ponzi schemes

• Found over 1,700 of these scams, half of which end within a week of being started.

• Frequency of victim and scammer posts is negatively correlated with scam survival

• Forum history positively correlated with scam survival