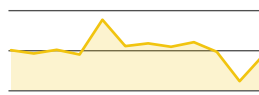




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NEWS

Bank of Canada Research: Cryptocurrency Arbitrage Doesn't Exist

Joon Ian Wong (@jooonian) | Published on August 13, 2014 at 19:55 BST

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A new working paper from Canada's central bank has found little evidence that arbitrage opportunities in cryptocurrency markets exist.

The paper, *Competition in the Cryptocurrency Market*, analyses 10 months of publicly available data from exchanges like BTC-e and Cryptsy, from May 2013 to February 2014.



Examining how 'network effects' (the phenomenon of new users augmenting the value of a technology) affect competition in the cryptocurrency economy, the paper looks at competition between both cryptocurrencies and cryptocurrency exchanges. The authors write:

"For exchanges, we find little if any evidence of arbitrage opportunities. With no arbitrage opportunities, it is possible for multiple exchanges to coexist in equilibrium."

The paper was written by Hanna Halaburda, a senior analyst in the bank's currency department, and Neil Gandal, chair of the Eitan Berglas School of Economics at Tel Aviv University.

Data and methodology

For data, the authors have used 'closing rates' of bitcoin, litecoin and other digital currencies from exchanges BTC-e, Cryptsy, Bitstamp and Bitfinex for the period between 2nd May 2013 and 28th February this year.

This data was obtained from Cryptocoinscharts.info and the closing rate is the given digital currency's price at midnight GMT, according to the paper.

In analysing competition between exchanges, the authors looked at 'two-sided network effects'. This is a phenomenon that arises when buyers and sellers in a given market both compete for a larger number of counterparties: buyers of bitcoin prefer markets with more sellers, while the opposite is true of sellers.

The aggregate effect of this phenomenon is the creation of "thicker, more liquid" markets. A large exchange possesses more liquidity, and over time, it will dominate the exchange market. In this

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scenario, network effects would give rise to a convergence in digital currency trading to a single exchange over time.

But other network effects are also simultaneously at work. The 'negative same-side effect' suggests that sellers, while seeking markets with more buyers, also wish to avoid competition, or markets with large numbers of sellers. The opposite holds true for buyers.

To determine the aggregate network effects at work between exchanges, the authors looked at prices for three currency pairs, BTC/USD, LTC/USD and LTC/BTC, on three exchanges: BTC-e, Bitstamp and Bitfinex. It ran two tests, correlation and regression analysis, on the data.

Arbitrageurs dispute the findings

The paper's correlation analysis found that the BTC/USD currency pair prices were highly correlated between BTC-e and Bitstamp. It found the same for the LTC/BTC pair across BTC-e and Bitfinex.

Regression analysis yielded similar results, with the paper concluding that arbitrage opportunities were unlikely to have existed across the exchanges in trading any of the currency pairs.

However, two traders who were alerted to the paper dispute its conclusions and methodology. Arthur Hayes is a former equity derivatives trader at Citi and the chief executive of BitMEX, a bitcoin derivatives exchange. He makes money as an arbitrageur, trading between various exchanges. He observed:

"I make a significant portion of my income from conducting arbitrage between different bitcoin exchanges. The [second half of 2013] was a very profitable time for arbitrage strategies."

In other words, Hayes is an arbitrageur who profits from a market phenomenon that the Bank of Canada's working paper says does not exist.

Hayes even offered a historic example of a profitable arbitrage strategy:

"For almost a week, there was 20-40% arbitrage [opportunity] between European and Chinese exchanges trading at considerable premiums. The reverse, where China traded cheaper than Europe, was also witnessed [this spring] when [China's central bank] made announcements relating to banks dealing with bitcoin exchanges."

Proposed improvements

In Hayes' view, the authors couldn't pick up on arbitrage opportunities for two reasons: comparing prices between too few exchanges and using regression analysis instead of a simple time series of price data.






Hayes pointed out that paper only compared prices between European exchanges. For a better insight the authors should have compared prices across continents, he added.

"The issue is that these guys looked at European exchanges versus each other and Chinese exchanges versus each other. They didn't compare all exchanges versus each other."

Another trader, Joseph Lee, created arbitrage bots that managed his trading for a year, netting him hundreds of thousands of dollars. He has since retired the bots to focus on derivatives exchange BTC.sx. Lee also disagrees with the conclusions of Halaburda and Gandal's working paper.

"Without a doubt, arbitrage opportunities have existed in [the period of study] and will always exist in the market. They even exist in the current financial market which has trillions of dollars of liquidity," he said.

Lee points out a flaw in the paper's methodology: the authors relied on 'closing rates' for price

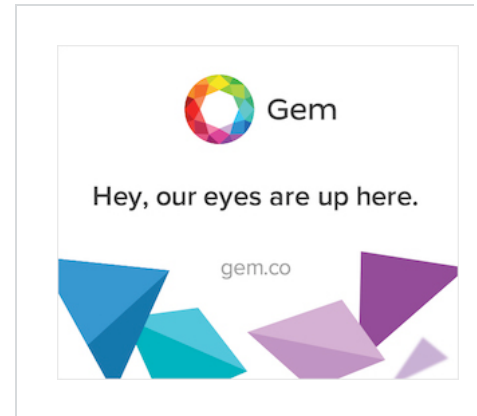
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data, which Lee says would never show an opening for arbitrage.

Closing rates are a snapshot of prices at a given time (in this case midnight GMT) and they are used to represent the currency's price for a 24-hour period. However, because arbitrage opportunities are fleeting – they disappear in seconds as arbitrageurs see them and pile in – closing rates aren't sensitive enough to reveal these moments.

Lee added:

"The study has to be done on actual traded prices if it's looking historically. Arbitrage opportunities don't last 24-hour periods. In bitcoin they last minutes, if not seconds."

Other findings and caveats

The paper briefly acknowledges that its use of daily price data may have problems. It notes that arbitrage opportunities may be found if price differences between exchanges are compared at different times during a day.

"We leave this more detailed analysis to further research," the authors noted towards the end of their paper.

Halaburda and Gandal also came to a number of other conclusions about network effects and cryptocurrencies. The pair found that bitcoin enjoyed positive network effects, but that other currencies, like [litecoin](#), were gaining ground. Bitcoin may not be able to maintain its dominant position in the long run, it concluded.

The Bank of Canada's working papers are intended for publication in peer-reviewed academic journals, but are works in progress. They are published with the intention of soliciting feedback from a technical audience. In the case of Halaburda and Gandal's paper, bitcoin's arbitrageurs have made their opinions known.

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Arthur · 8 months ago
"The pair found that bitcoin enjoyed positive network effects, but that other currencies, like litecoin, were gaining ground. Bitcoin may not be able to maintain its dominant position in the long run, it concluded."

Talking about incompetent, stupid and clueless... They take the wrong data, use an utterly wrong interpretation of that data, and the quote above tops it all. Let's say they took their research period (up to February 2014) for coming to that conclusion: Litecoin went from a market cap of ~1,000M at the end of November, 2013 to a market cap of ~350M. If they had looked at more recent figures, then it is even more dramatic: a further decline to a market cap of ~150M. Now that's what I call 'gaining ground'... Not!
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Luke Parker · 8 months ago
This PDF read like it was summing up all the attack vectors against bitcoin. Good to see they're still so clueless.
3 ^ | v · Share >

FreeJack · 8 months ago
Consider the source. It's another member of the firmly-entrenched money monopoly trying to protect its position by downplaying the "new guy on the block." They can't say, "Bitcoin doesn't really exist," so they say, "Bitcoin arbitrage doesn't really exist." But it does. It isn't great in periods of low volatility, but it's awesome in periods of high volatility and is another good weapon in the arsenal of a day-trader in digital currencies.
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Astounding
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whoa whoa whoa, Coindesk just reports the news. Well coin news.
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Chris Donnelly · 8 months ago
I would be interested to see what would happen if there was only one exchange for every coin like the NYSE of bitcoin/litecoin/darkcoin etc. And then see what would happen to the price of bitcoin/litecoin/darkcoin. Too many exchanges causes a dissolution of the market place. I guess that is why there are only several known trading floors in the world. NYSE / NASDAQ / London Stock exchange/ Tokyo/ Chicago / OTC / Paris / Euronext
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Fdiit They only looked at ITC and BTC..



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