

Crypto Currencies

Bitcoin vs. Money



Nicolas T. Courtois

UCL Bitcoin Seminar



UCL crypto currency seminar and special interest group

**every Thur starting 16h00 maybe 17h00 maybe 18h00 -
room and exact hour varies**

public web page: blog.bettercrypto.com / SEMINAR



Our Works on Bitcoin


- blog.bettercrypto.com
- Nicolas Courtois, Marek Grajek, Rahul Naik: *The Unreasonable Fundamental Incertitudes Behind Bitcoin Mining*, <http://arxiv.org/abs/1310.7935>
- Nicolas Courtois, Marek Grajek, Rahul Naik: *Optimizing SHA256 in Bitcoin Mining*, CSS 2014.
- Nicolas Courtois, Lear Bahack: *On Subversive Miner Strategies and Block Withholding Attack in Bitcoin Digital Currency* <http://arxiv.org/abs/1402.1718>
- Nicolas Courtois: *On The Longest Chain Rule and Programmed Self-Destruction of Crypto Currencies* <http://arxiv.org/abs/1405.0534>
- Nicolas T. Courtois, Pinar Emirdag and Daniel A. Nagy: *Could Bitcoin Transactions Be 100x Faster?* In proceedings of SECRYPT 2014, 28-30 August 2014, Vienna, Austria.
- Poster:
http://www.nicolascourtois.com/bitcoin/POSTER_100x_Secrypt2014_v1.0.pdf

Introducing Bitcoin





Bitcoin In A Nutshell

- bitcoins are cryptographic tokens
 - stored by people on their PCs or mobile phones
 - ownership is achieved through digital signatures:
 - you have a certain cryptographic key, you have the money.
 - publicly verifiable, only one entity can sign
- 
- An illustration of a hand in a blue sleeve holding a blue pen, signing a yellow document with black ink. The document has some scribbles on it. The background is a pink starburst.
- consensus-driven, a distributed system which has no central authority
 - but I will not claim it is decentralized, this is simply not true!
 - a major innovation is that financial transactions CAN be executed and policed without trusted authorities. Bitcoin is a sort of financial cooperative or a distributed business.
 - based on self-interest:
 - a group of some 100 K people called bitcoin miners own the bitcoin “infrastructure” which has costed about 1 billion dollars (estimation)
 - they make money from newly created bitcoins and fees
 - at the same time they approve and check the transactions.
 - a distributed electronic notary system



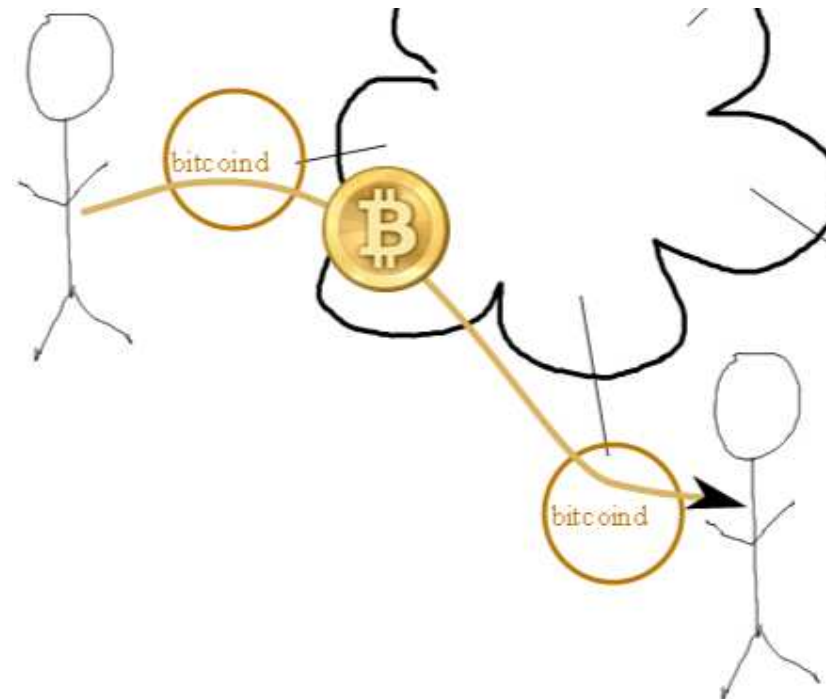
Two Key Concepts

- initially money are attributed through **Proof Of Work (POW)** to one public key A
 - to earn bitcoins one has to “work” (hashing) and consume energy (pay for electricity)
 - in order to cheat one needs to work even much more (be more powerful than the whole network, for a short while)
- money transfer from public key A to public key B:
 - **like signing a transfer in front of one notary which confirms the signature,**
 - multiple confirmations: another notary will re-confirm it, then another, etc...
 - we do NOT need to assume that ALL these notaries are honest.
 - at the end it becomes too costly to cheat

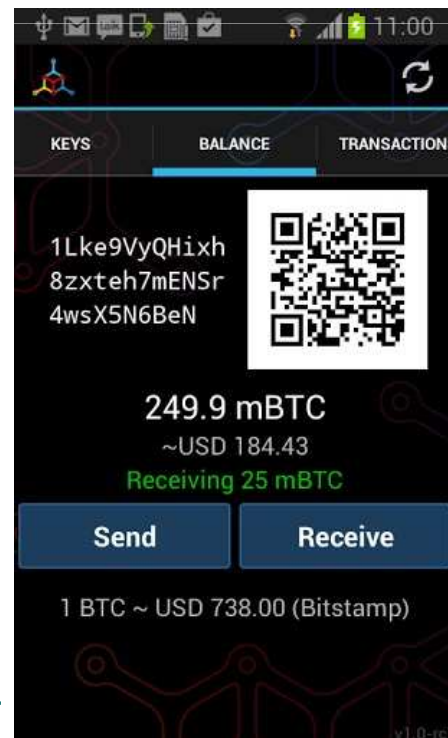
Money Transfer

To: 1K2CcfWYW5sBL2xSeQWXpcmjPCgoXdi36
Amount: 1.0 BTC

SEND



In Practice




Who Accepts Bitcoin? (1)



← → ↻ www.tigerdirect.com/bitcoin/?srkey=bitcoin

TigerDirect.com Find Store Today Only For Business My Account | Track Order | Gift Cards | Catalog | Help ▼

Live Help or (800) 800-8300 Search by Keyword or Item # Go Hello Sign in or New Customer Shopping Cart: \$0.00

Shop All Products Deals & Gifts Services  Sign Up Today **Exclusive Savings for the Big Game**

TigerDirect.com Now Accepts Bitcoin Payments!

We're excited to announce we now accept Bitcoin digital currency. Bitcoin is an innovative payment network and a new kind of money. See below to learn more.

Who Accepts Bitcoin? (2)



Send using a Coinbase.com account

You are signed in as clin@expedia.com. Not you?

Clicking 'Pay' below will send \$57.00 USD (0.100263 BTC) from your Coinbase account.

[✓ Pay \\$57.00 USD](#)

Send using a bitcoin address

[Don't have any bitcoin?](#)

 Overstock.com®



\$20M in 2014?

Who Accepts Bitcoin? (3)



by the end 2014



Full P2P Client

<http://bitcoin.org/en/download>

Download Bitcoin-Qt

Latest version: 0.8.6 



Download Bitcoin-Qt



You will need to be patient

15 giga, 24 hours...



Windows (exe)

~12MB



Mac OS X

~14MB



Windows (zip)

~16MB



Linux (tgz)

~16MB



Ubuntu (PPA)

~4MB



Source code

(GitHub)

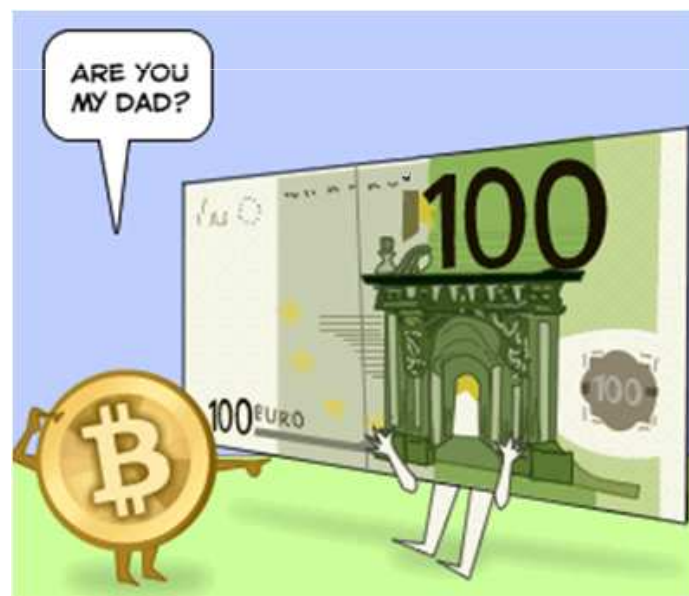


Mobile Apps - Android



Bitcoin			SEND COINS	ADDRESS BOOK
BTC 1.1163			Your Bitcoin Address:	
= EUR 55.7050			1KGeNiDwzHSN	
			rdwNETj3hQEx	
			wr5HMN9eFW	
	balance	67.9065	Received	Both
CNY	rate	416.78	Apr 6	← 1719Pmohr5Ck1dX6mQ9zYj4nTPn6D
	balance	465.2653	Apr 5	← Beer with Lisa
DKK	rate	328.56	Apr 5	→ 1Q4H8CY4FpnJ93SPbdz4Cqgv714KX
	balance	366.7824	Apr 4	→ Burger @ room77
EUR (default)	rate	49.90	Apr 4	← 1G9Hjz1JCUqnhNQmpxLhsVL6FD8Co
	balance	55.7050	Apr 4	← Donation
GBP	rate	40.74	Apr 3	← 1FUGqeguKnVFavXYqKwYB7g4YKXJ4
	balance	45.4794		
HKD	rate	506.94		

Is Bitcoin Money?



© 2014 Geek Culture

Money

Key invention
in human history:

money



- here is some money for your research

Is Bitcoin Money?



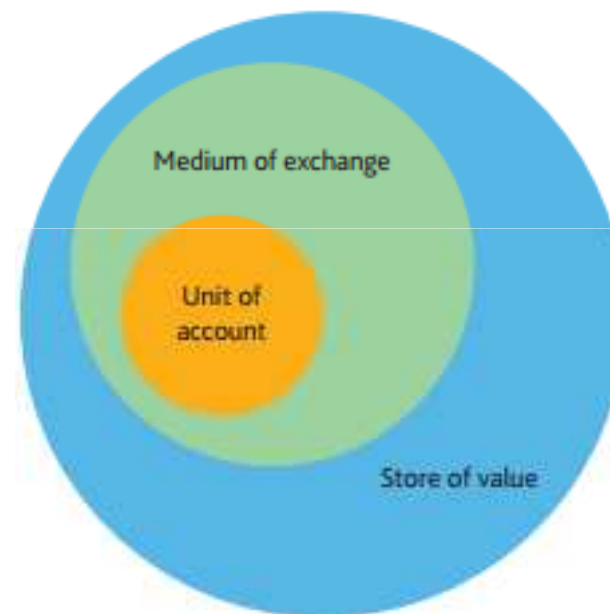
- We will NOT claim it has all the characteristics of money.
 - it definitely has some!
 - they are traded against traditional currencies at a number of exchanges.
 - bitcoins are “legal” by default,
 - there were some attempts to regulate them and even ban them by governments.

2/3 Main Functions of Money

1. Store Value
2. Allow Payment
- (3. Unit of Account)

Hierarchy: 3. Is The Hardest To Achieve!

- 1. Store Value
- 2. Allow Payment
- (3. Unit of Account)



source: BOE report “The economics of digital currencies “, 2014

Evolution of - 1. Store Value

- Precious natural resources: salt etc => evolution/selection=>
- Gold, Silver, Other Metals => Coins
- Paper Money
- Money as **Electronic Record**
+ Legal Protection + Government Guarantee
- 21st century: Cryptographic E-Cash



Evolution of - 2. Payments

- Physical Cash (Bank Notes, Coins) = M0
- Cheques
- Electronic Bank Transfer 20 days => 15 min...
- **E-Purse Systems:** geldkarte, London Oyster
- **Bank Cards**
- **Contact-less Bank Cards**, e.g. MasterCard PayPass:
- 21st century: Cryptographic E-Cash.



difference?

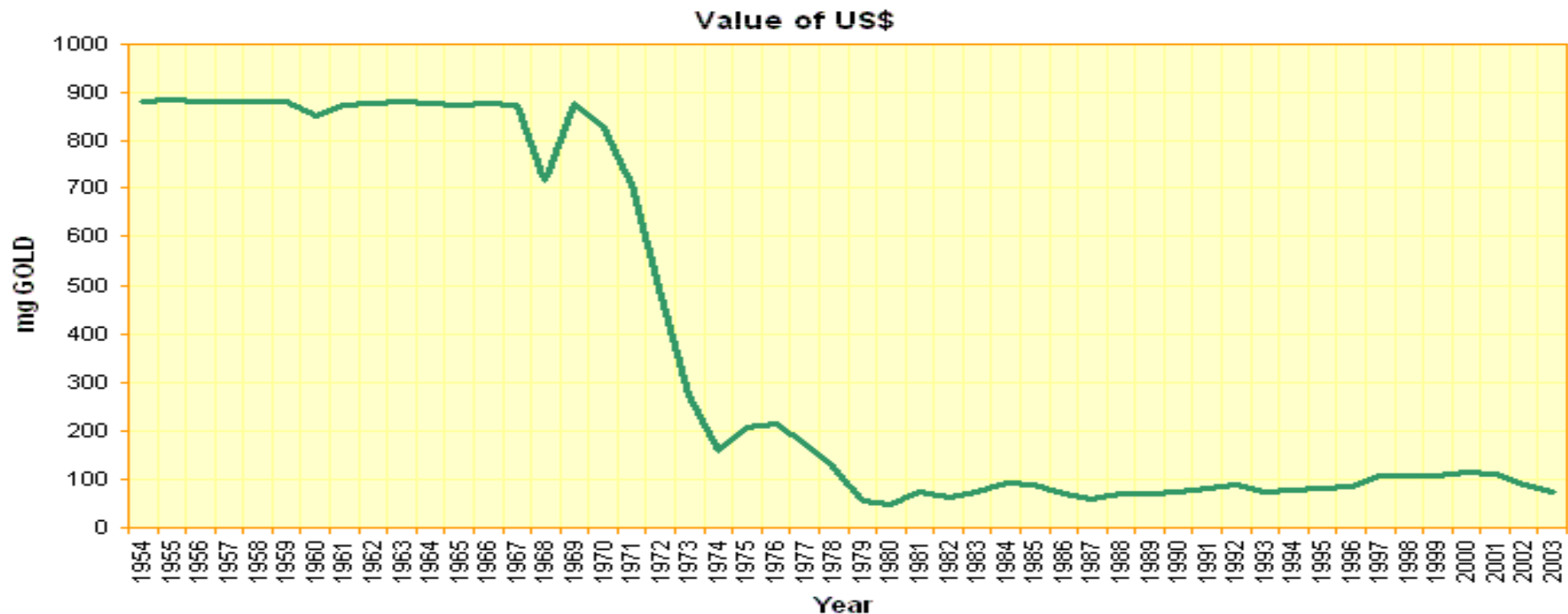


Gold = “Global Single Currency”??

Most countries abandoned the gold standard during the Great Depression,

– one of the earliest was the Bank of England [1931].

Much later, in 1971: the United States abandons it. Nixon Shock



“Fiat Money”

Def:

Government-issued money not convertible for anything particular
(E.g; gold, goods etc).

Its value is controlled by the monetary policy
and managed by the central bank.

(the quantity of money in circulation can be increased or **decreased** at any moment)



BOTTOM LINE

1. Store Value
2. Allow Payment



CAN BE IMPLEMENTED DIFFERENTLY!

SEPARATION IS NOT FORBIDDEN

Bitcoin

Bitcoin =

... the most popular peer-to-peer
payment and virtual currency
system as of today

Bitcoin

Bitcoin =
... the most popular

The Telegraph

The coming digital anarchy

belongs to no one, anarchy



Crypto Currencies



Bitcoin



Decentralized peer to peer payment system
which works as currency:

=> has units of value which can be exchanged
for “real money”. Currently 1BTC= 600 USD.

Based on cryptography and network effects.

Anarchy, not supported by any government
and not issued by any bank.



*Disruption?

Disruptive Technology:

def:

Allows to do things which just could not be done before...

**Citations

Bitcoin is:

- **Wild West** of our time [Anderson-Rosenberg]
- There is **no “undo” button** for sth. like bitcoin [Mike Gogulski]



Krugman

- What's wrong with Bitcoin? [title]
- Bitcoin is ...
 - just one of possible ways
to pay electronically [irony 😊]
- Paul Krugman,
Nobel price in economics



More Krugman!

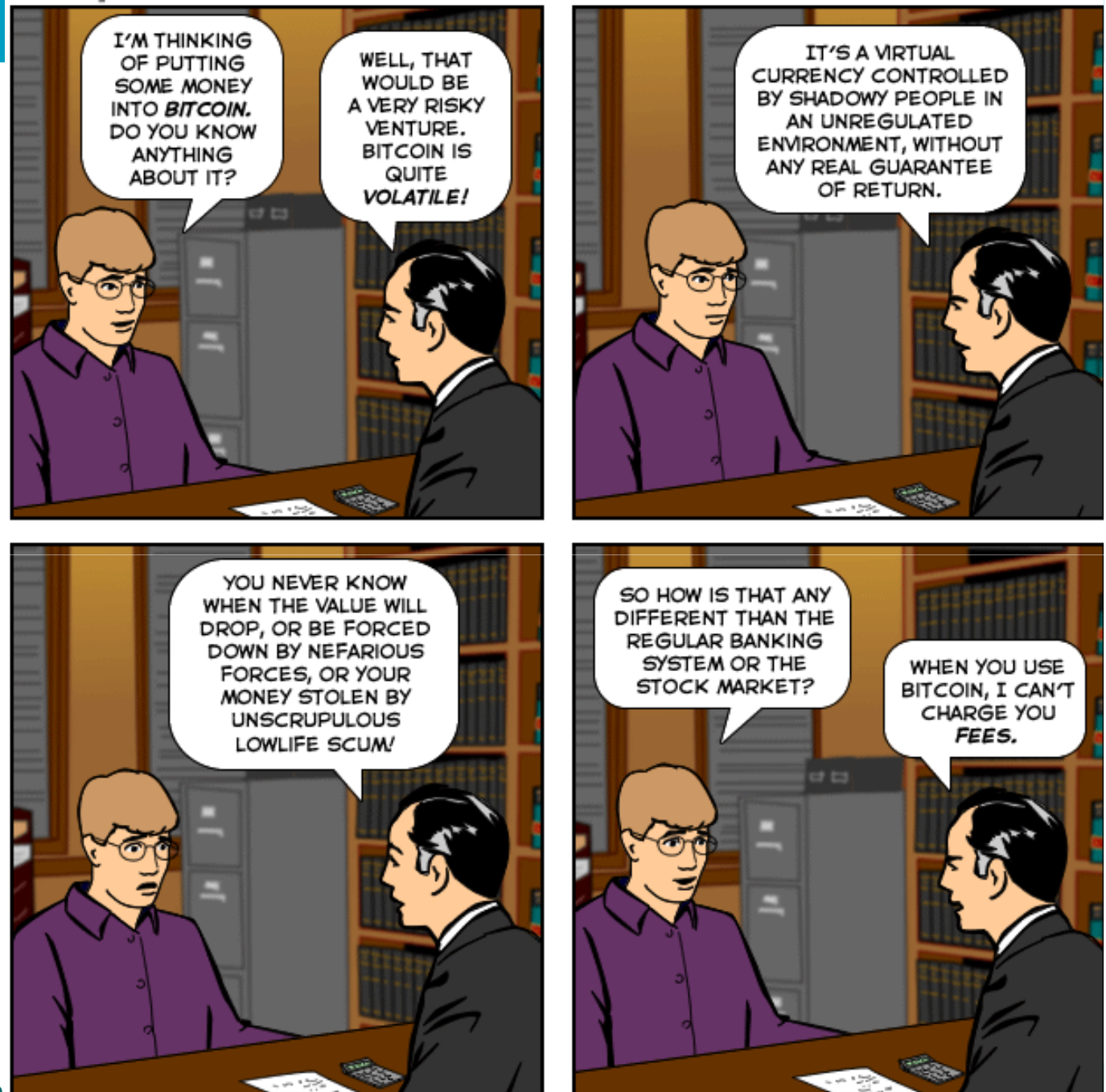
- Bitcoin is ...
 - “the anti-social network”
 - “bitcoin is evil” (he later claimed it was a joke)
- Paul Krugman,
Nobel price in economics



Who Is Evil?

- “Bitcoin Prevents Monetary Tyranny”
- Jon Matonis for Forbes
- “Just thinking about bitcoin makes you a better person” – Max Keiser

Bitcoin vs. Banks



Fear?

What do I fear?

I fear stagnation and lack of progress.

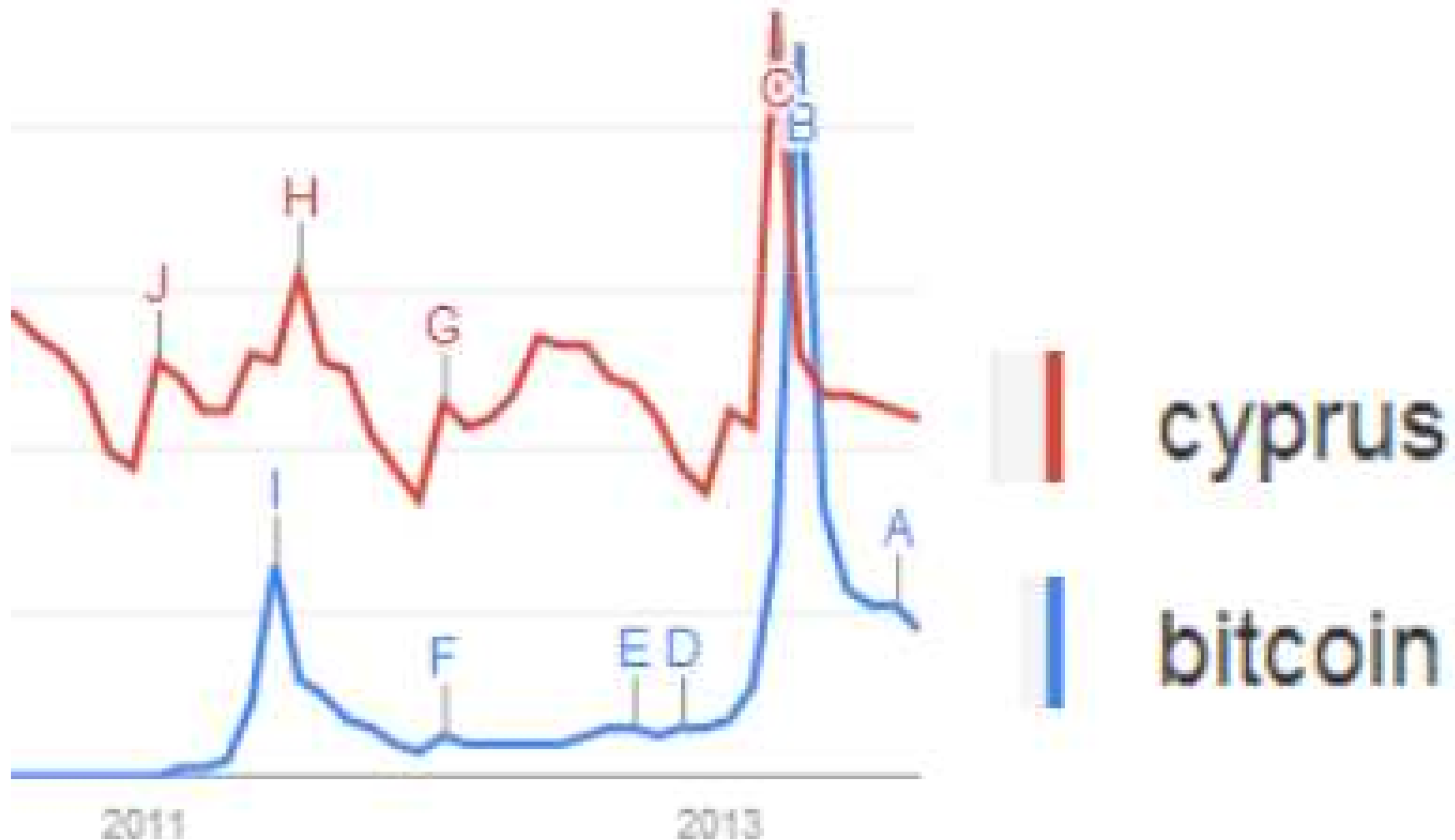
I fear never reaching my potential and being average.

I fear letting those I love down, letting myself down.

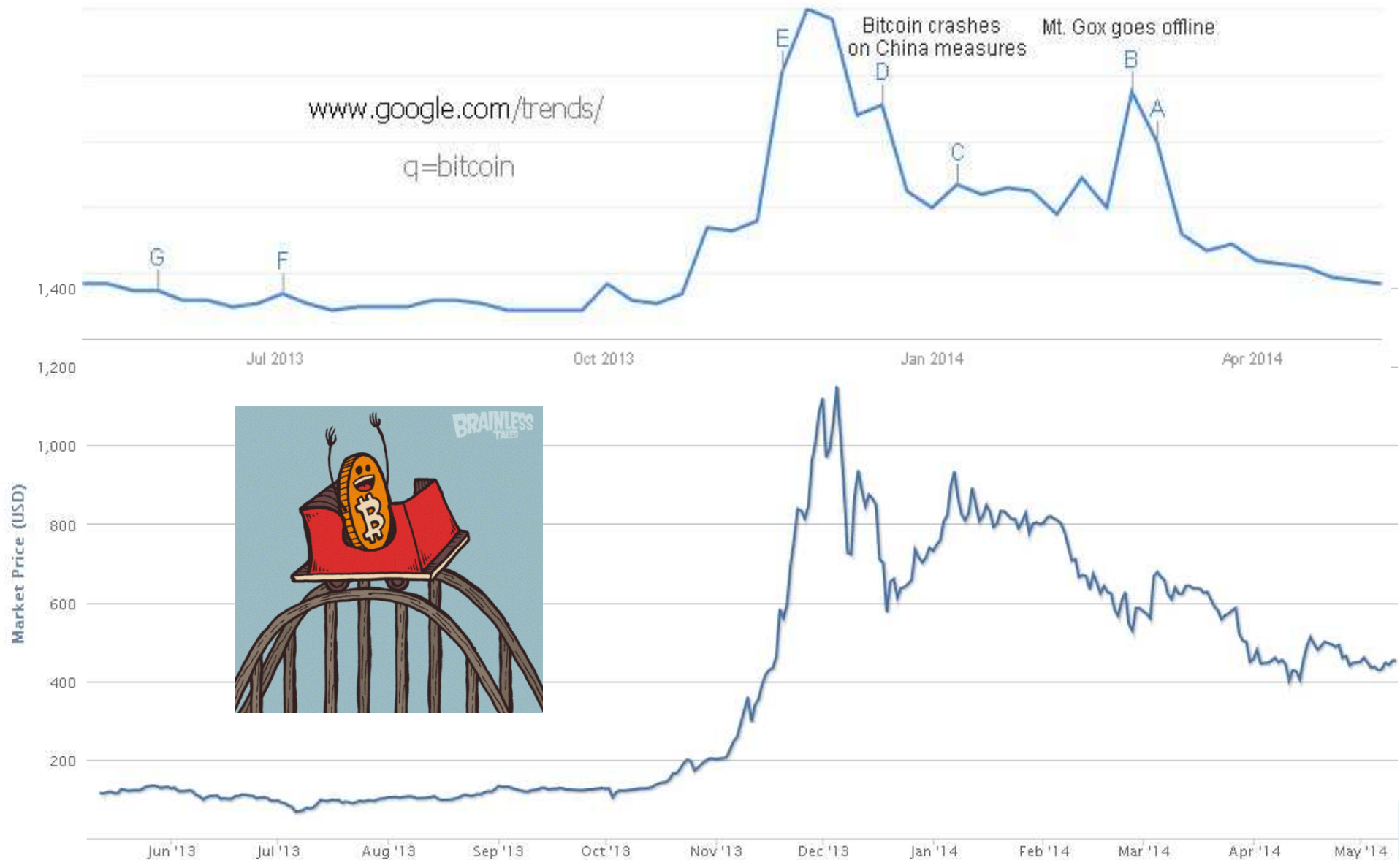
I fear settling, giving in to the “that's just the way it is” mindset.

Cyprus vs. Bitcoin – April 2013

correlation in Google searches



**Google Searches vs. Price 2013/14



April 2013

- there was a Cyprus banking crisis...
depositors were unable to recover 100% of
their deposits
- opinions about how crazy it was that bitcoin
could rise...

FINANCIAL TIMES

USA Thursday April 4 2013

Buying frenzy sends virtual currency on way to becoming next bubble



bubble?

they have
seen nothing yet!

13 April 2013

The correction stops at around 50 USD.

~~Virtual currencies~~

Mining digital gold

Even if it crashes, Bitcoin may make a dent in the financial world

Apr 13th 2013 | From the print edition

 Like

2.3k

 Tweet

545

The
Economist



13 April 2013

Bitcoin is:

- Digital Gold! - The Economist



Jan 2013-Jan 2014

14 => 1000 USD



“Bots Caused Bitcoin Bubble”

Anonymously published Willy Report:

- algorithms, named Markus and Willy, bought up **650,000 bitcoins** in the dying days of the MtGox exchange, causing the price of bitcoin to soar above \$1,000.
- “there is a ton of evidence to suggest that all of these accounts were **controlled by MtGox** themselves”
- “so if you were wondering how bitcoin suddenly appreciated in value **by a factor of 10** within the span of one month, well, this may be why.”
- ...also claimed to be bought with customer money



<http://www.ibtimes.co.uk/cryptocurrency-news-round-mtgox-bots-caused-bitcoin-bubble-darkcoin-dives-1450415>

Another Nobel Price:

In Davos Jan 2014:

“It is a bubble,
there is no question about it.
... It’s just an amazing example of a bubble.”



- Robert Shiller, Nobel price in economics, awarded specifically for work on asset bubbles.



***Flash Crash 10 Feb 2014 before 6AM



Miracle Of Bitcoin



Removes two pillars of money:

- “trust”

=> Peer 2 Peer self-regulation
based on self-interest?

- legal/government protection and policing

=> anarchy!



Anarchy!



- Until recently, we've needed central bodies – banks, stock markets, governments, police forces – to settle vital questions.
 - Who owns this money?
 - Who controls this company?
 - Who has the right to vote in this election?
- Now we have a small piece of pure, incorruptible mathematics enshrined in computer code that will allow people to solve the thorniest problems without reference to “the authorities”.

<http://www.telegraph.co.uk/technology/news/10881213/The-coming-digital-anarchy.html>

[11 June 2014]

The Telegraph

The coming digital anarchy

Anarchy? Dark Side

- In Bitcoin community we are brainwashed every day: many things which are BUGS are presented as FEATURES:
 - monetary policy (or the lack of one) – frequent criticism
 - dodgy cryptography =
 - anonymous founder syndrome, standardized yet TOTALLY disjoint from normal industrial cryptography, NOBUS syndrome (NSA jargon)
 - decision mechanisms (the Longest Chain Rule)
 - no reason why the same mechanism decides which blocks are valid and which transactions are valid, by far too slow, too unstable, too easy to manipulate
 - 51% attacks ARE realistic feasible and ... INEXPENSIVE!
 - sudden jumps in monetary policy => genetically-programmed self-destruction of many crypto currencies



See: Nicolas Courtois: [On The Longest Chain Rule and Programmed Self-Destruction of Crypto Currencies](http://arxiv.org/abs/1405.0534) <http://arxiv.org/abs/1405.0534>

Is Bitcoin Money? A Currency?



*Recall: Two Main Functions of Money

1. Store Value
2. Allow Payment
- (3. Unit of Account)



Are They Crazy?

Anything can be “money”
if sufficiently many people accept it... (e.g. salt).

Question of:

- popularity

legal tender, government standardization and regulation
≤ recently thousands of press reports about bitcoin

- trust

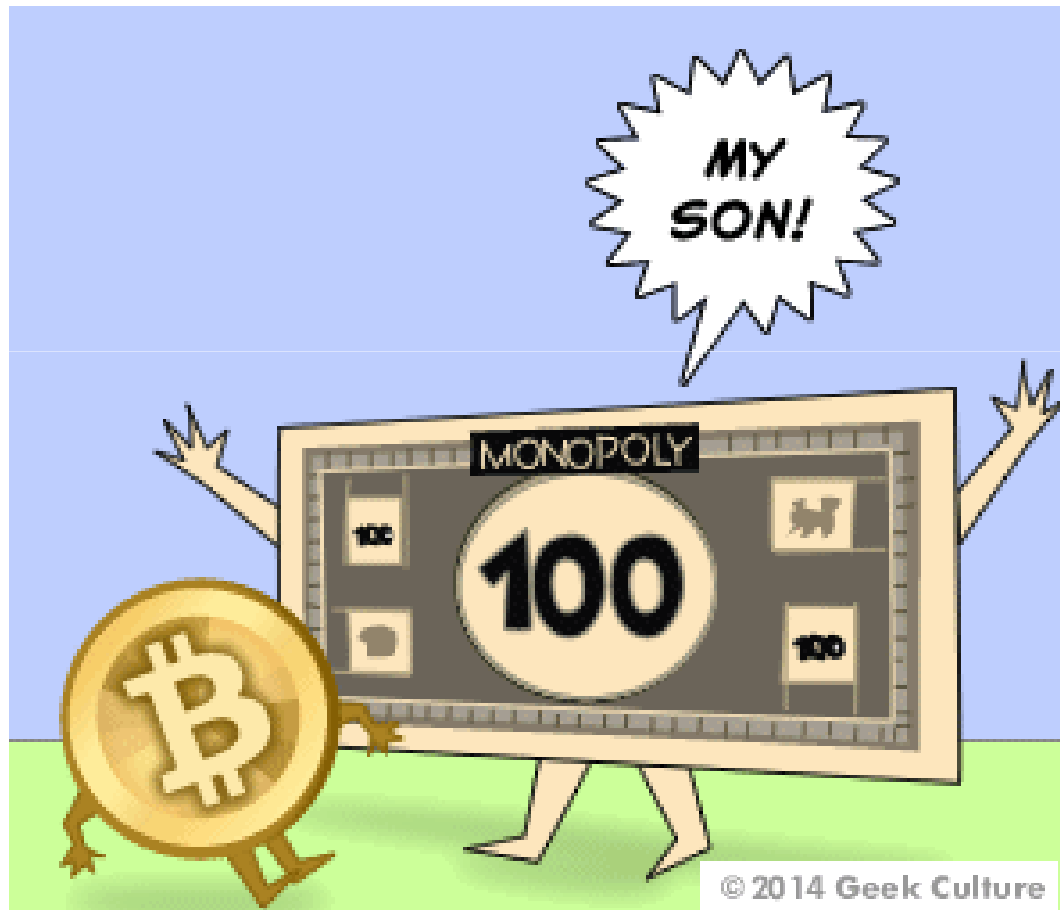
trustworthy authority

≤ assumption that majority of people are “honest”
MUCH WEAKER...

NO NEED TO TRUST ANYONE

Play Money?

A distinction play vs. real money has almost disappeared recently.



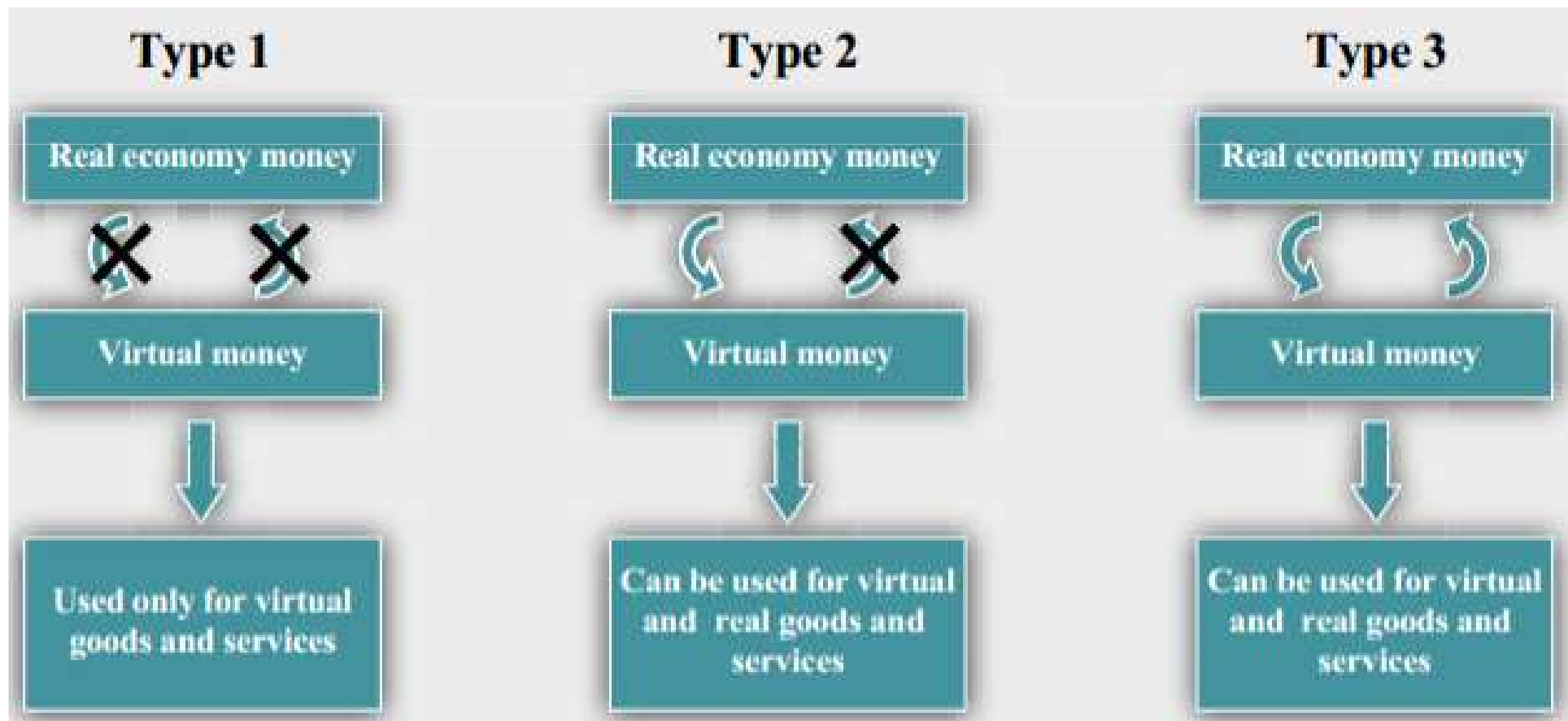
Types of “Virtual Money”

Source: ECB report, 10/2012

<http://www.ecb.europa.eu/pub/pdf/other/virtualcurrencyschemes201210en.pdf>



cf. Oyster...



Is Bitcoin Money?

Legal Side



Bitcoin Foundation Denial...

Ms. Tara Murphy

Assistant Attorney General

California Department of Financial Institutions

July 1, 2013

Page 3

operates out of offices in Seattle, Washington. The Bitcoin Foundation provides no direct money services to any California consumers. Several Bitcoin Foundation members may themselves operate in California. Some California-based members, from time to time, donate money or bitcoin to the Foundation. However, the receipt of a donation is not money transmission activity and does not otherwise indicate that the Bitcoin Foundation operates in California.

B. The Bitcoin Foundation Does Not Sell or Issue Payment Instruments.

The Bitcoin Foundation is not in the business of selling bitcoin to consumers and does not otherwise operate a bitcoin exchange. Even if it did sell bitcoin to consumers, however, the Foundation believes it would not be regulated as a seller or issuer of payment instruments because **a bitcoin is not a payment instrument under California law.** In California, a payment instrument is "a check, draft, money order, traveler's check or other instrument for the transmission or payment of money or monetary value, whether or not negotiable."⁴ A payment instrument "does not include a credit card voucher, letter of credit, or any instrument that is redeemable by the issuer for goods and services provided by the issuer or its affiliate."⁵

**Can Bitcoin Circumvent Laws?

Like “this is not money”=>
therefore we don’t do anything
which falls within remit of existing laws
(securities trading, gambling etc..)

Not so easy:

The Department of the Treasury Financial Crimes Enforcement Network ([FinCEN](#)) has clarified that cryptocurrency is not money, [but](#) all existing [AML](#) (Anti-Money Laundering) and [KYC](#) (Know Your Customer) regimes do nevertheless apply(!).

- Judge Amos Mazzant issued a memorandum arguing that bitcoin was “a currency or a form of money”.
- [SEC](#) clearly stated that transactions in bitcoins are [financial transactions like any other](#), and are within their remit.

Bitcoin Can Simplify Our Lives

Less money spent on lawyers.

Especially important for people and governments

- they cannot afford legal costs



Bitcoin Is Subject To Laws!

Governments judges and regulators will apply the rules which they think applicable, they are emerging and they are being clarified.

Bitcoin laundry question:

- If I mix bitcoins with other people.
- UK: Proceeds of the Crime Act:
 - If I have assisted sb. in money laundering, I must report it to the Police or I can be prosecuted and go to prison.

**US Regulation?

- Bitcoin does not share characteristics with instruments that we regulate as securities.
- Consequently, the SEC, like the Federal Reserve, is an unlikely regulator.
- [...] perhaps the Commodities Future Trading Commission (CFTC) will decide that it could supervise Bitcoin as a commodity.
- absence of a legitimate authority recognizing and attributing value to Bitcoin provides supervisory opportunity to the Consumer Financial Protection Bureau (CFPB), which has as a mandate ensuring consumer financial safety
=> all according to a Wall Street lawyer Maese.

****Block Chain Regulation**

The same Wall Street lawyer also says that:

- The Block Chain technology could be SEPARATELY regulated (!!!)
 - not proposing that the weightiness of bank regulation [...] be applied to tech start-ups
 - codification of development standards that good developers already use could help the network become safe.

Cf. Vivian A. Maese: [Divining the Regulatory Future of Illegitimate Cryptocurrencies](#), In Wall Street Lawyer, Vol. 18 Issue 5, May 2014.

**Open Source = Criminals' Best Friend?

...same Wall Street lawyer:

- The open-source nature of the developer population provides opportunities for frivolous or criminal behavior that can damage the participants in the same way that investors can be misled by promises of get rich quick schemes [...]
- a self-regulatory organization (SRO) [...] could be created to oversee and examine [...] the engineers who create the code [...]
- Regulations could ensure that cybersecurity requirements are engineered into the code and could ensure that the network would recover from a failure by building in redundancy. [...]
- One of the biggest risks that we face as a society in the digital age [...] is the quality of the code that will be used to run our lives.

Cf. Vivian A. Maese: [Divining the Regulatory Future of Illegitimate Cryptocurrencies](#), In Wall Street Lawyer, Vol. 18 Issue 5, May 2014.



*UK

Problem:

Initially UK HMRC have suggested that bitcoins are “VAT taxable vouchers”

- when you buy bitcoins you should pay 20% VAT...

⇒ totally inappropriate classification, now abandoned.

Is Bitcoin “Electronic Money”?

Directive 2009/110/EC of the European Parliament and of the Council defines the concept of “electronic money”,

Article 2: electronic money “means **electronically**, including magnetically, **stored monetary value** as represented by a claim on the issuer which is issued on receipt of funds for the purpose of making payment transactions [...], and which is accepted by a natural or legal person other than the electronic money issuer”.

Is Bitcoin “Electronic Money”?

This has been disputed;

- YES “electronically stored monetary value”

YES but stored in a diffused distributed way and valid if not spent and with regard to a majority of ASIC votes...

- NOT “as represented by a claim on the issuer”
- there is no “LEGAL” entity acting as issuer
- however
 - there is no legal obligation but a technical and practical claim which works, not a debt though,
 - and YES there exist issuers: miners,
 - or a collective issuer... “the bitcoin community”

Bitcoin in Northern Europe

Bitcoin is “private money” in Germany.

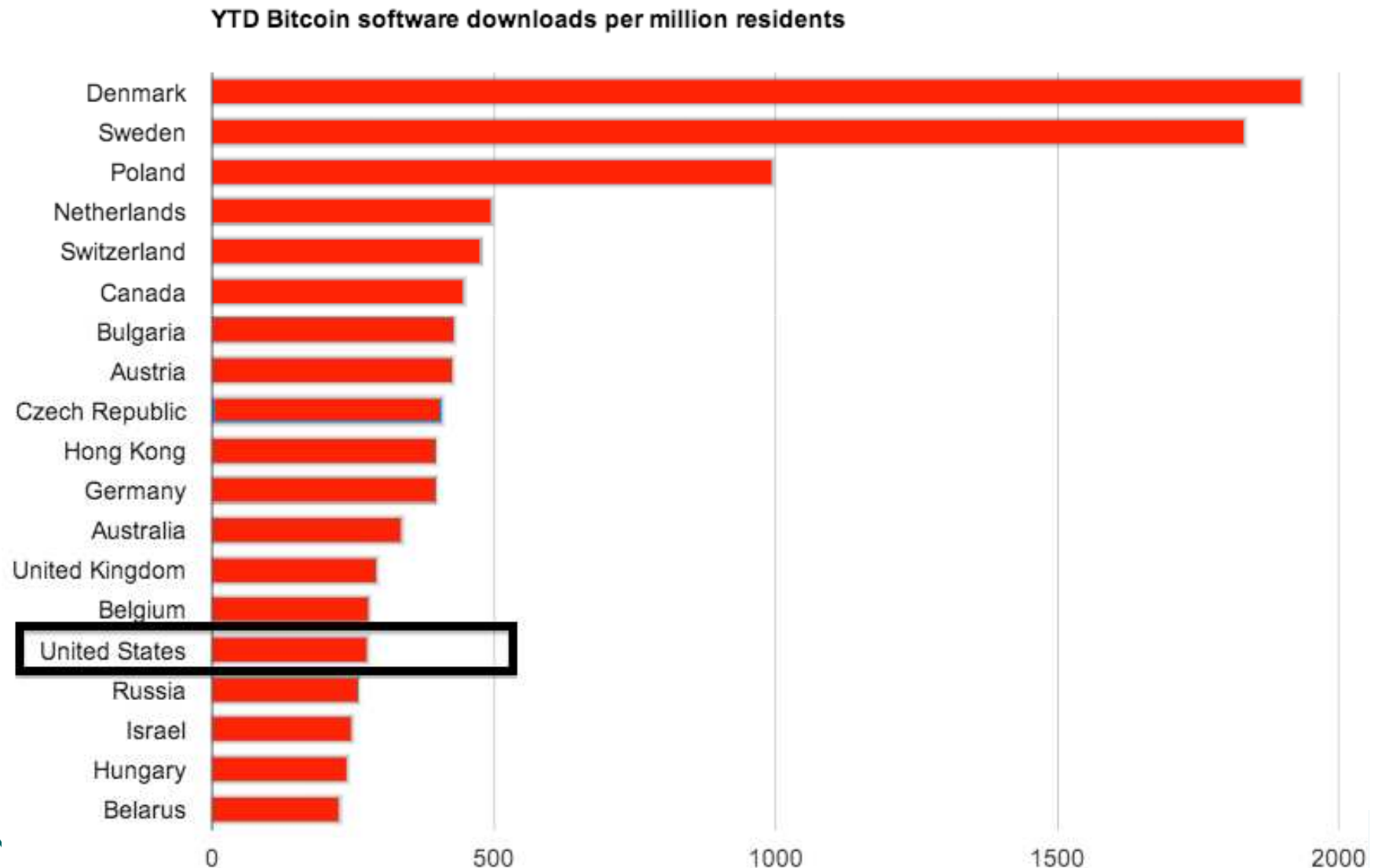
Denmark:
very liberal, no tax.

Sweden:
Bitcoin = method of payment.

Finland: detailed rules,
closer to a commodity.

Bitcoin in Northern Europe!

<http://www.businessinsider.com/bitcoin-is-going-to-take-off--just-probably-not-thanks-to-anyone-you-know-2014-6>



Canada

Very good environment, ATMs, start-ups

Bitcoin vs. Paypal, WesternUnion Etc



Bitcoin is...

“a low-cost replacement for credit cards and other payment mechanisms”

Very close to the business of

- Western Union
- CurrencyFair
- PayPal
- Mastercard

Bitcoin is a direct threat to these companies.

Competition Before Bitcoin

Credit cards:

slow adoption:

- it took 100 years to get people to use them!

Btcoin vs. Credit Cards



TERI BUHL

SMASHMOUTH INVESTIGATIVE JOURNALISM

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Mastercard Hates Bitcoins

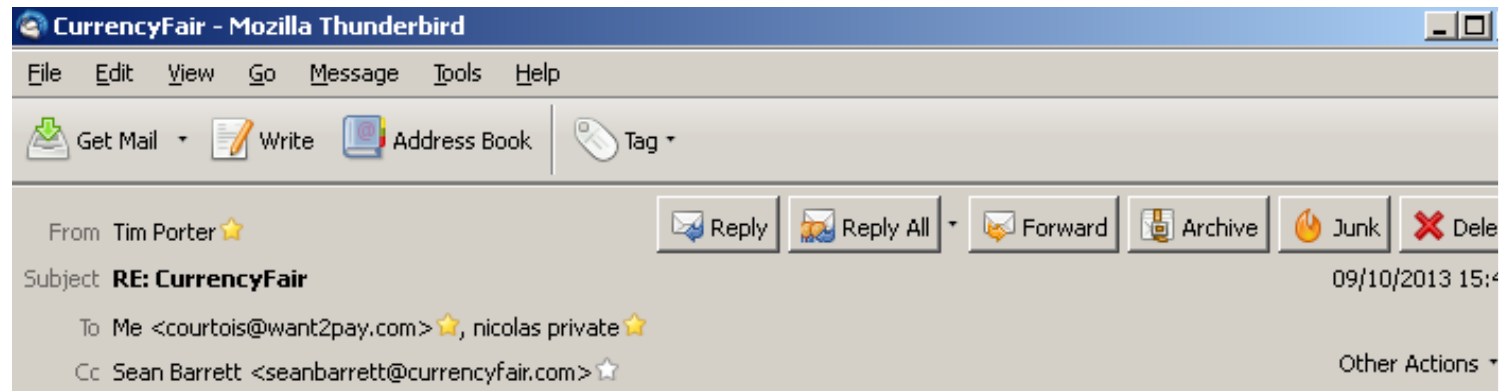
22
Oct

The new boss in charge of giving out a MasterCard licenses has no intention of allowing the brand or any bank that does private label cards to use Bitcoins. In fact, he nearly bragged to me about killing the BitInstant deal with a U.S. bank for the first planned \$BTC card this year.

Donate with Bitcoin



**Blacklisting Bitcoin By Banks



Dear Nicolas,

Thank you for your email below and the associated correspondence, but we are not in a position to process your transfer instruction at this time. We currently have policies in place which prohibit the transfer of funds to any crypto currency exchange or any crypto currency related firm.

We apologise for any inconvenience this may have caused you, and are happy, as gesture of goodwill to return your funds to EUR at no cost to you if you wish.

We have initiated our complaints process and your complaint will be processed as swiftly as possible in accordance with the regulatory requirements.

Best regards

Tim Porter - Associate Director

M +4 , T +44 20 3384 6290

E: timporter@currencyfair.com W: www.currencyfair.com FB:

www.facebook.com/currencyfair

CurrencyFair Limited CRO 469391 (Incorporated in Ireland)

Registered Office: 26 Pembroke Street Upper, Dublin 2, Ireland

Beware!

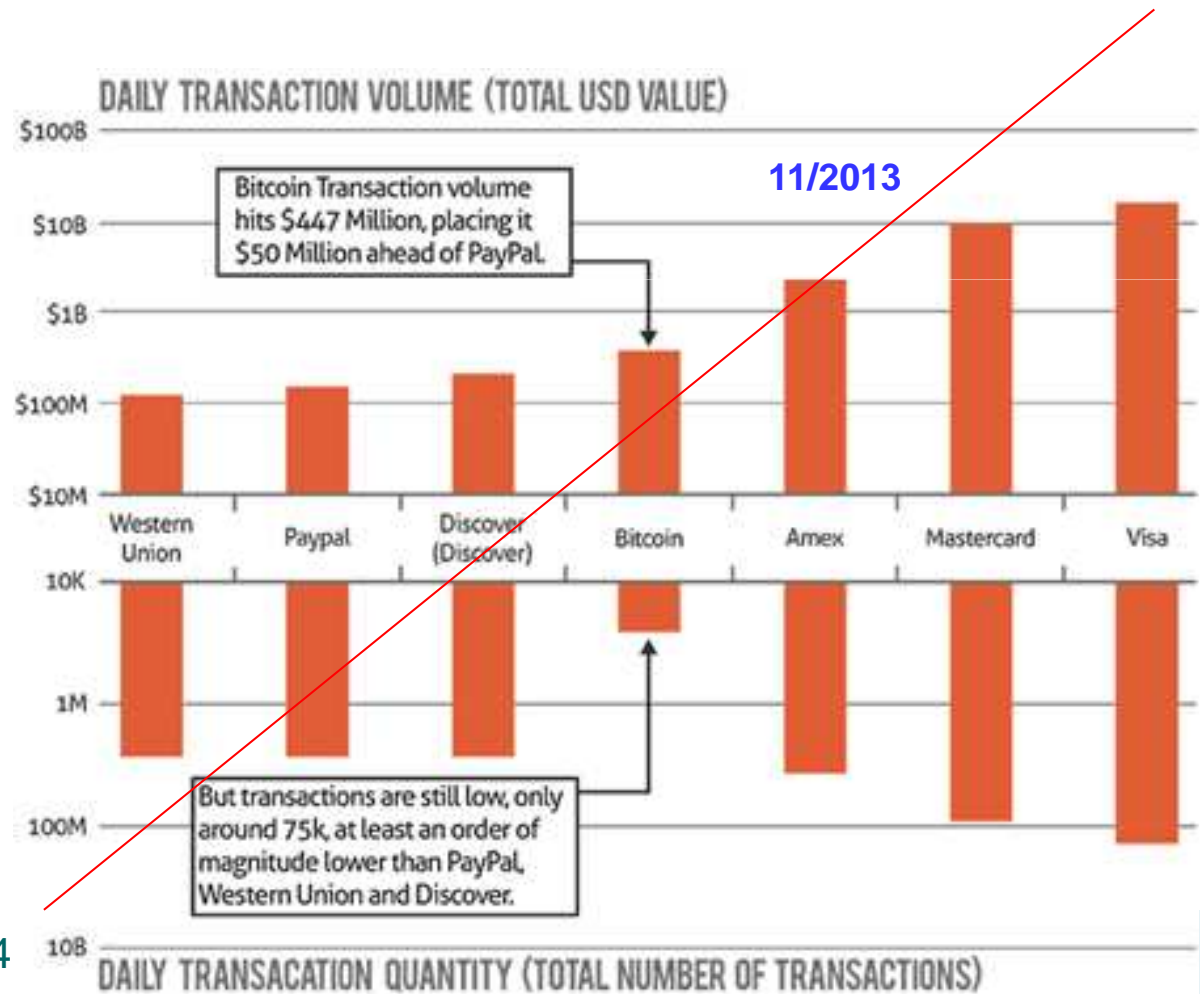
Bitcoin transaction volume: usually **WRONG reports**, includes amounts people return to themselves

Similar data:

coinometrics.com

=> controversy:
“pitiful statistics out
of BTC fairyland”

Reuters: Fitch:
Bitcoin Remains Small
in Comparison ...
68 M/day



More Lunatic Asylum Seekers

More **WRONG** reports, May 2014

Laureate Trust Claims BTC's Transaction Rate Will Soon Surpass Paypal

Posted On 24 May 2014 By : Ali Najjar 1 Comment Tag: Bitcoin, Paypal, USD Transactions

Laureate Trust is reporting that bitcoin is becoming the world's fastest growing payments option over the internet. Almost \$300 million USD are moved each day through bitcoin transactions.

PayPalTM



Laureate Trust

Bitcoin is currently on the road to overtaking Paypal in terms of transactional volume for the first time ever. Even with bitcoin's fluctuating nature, people are always making the digital currency work.

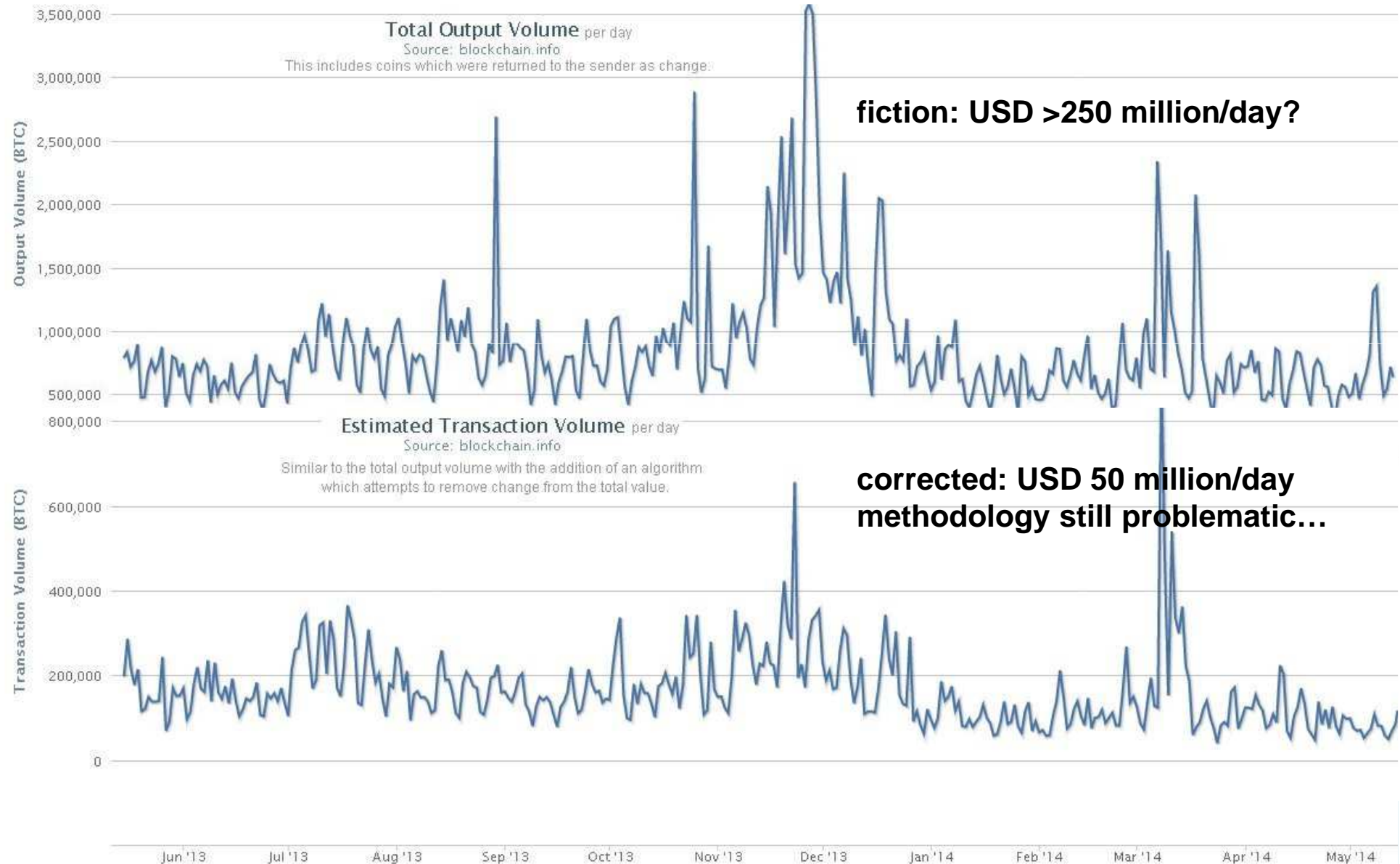
Laureate Trust's CEO Peter Tasca stated:

"Whenever you have an instrument that trades over 300 million US dollars a day, it must be recognized. The digital currency works, Bitcoin has greater volume transactions than Western Union and we anticipate it will overtake Paypal later this year."

*Problems:

- It is very difficult to reliably estimate the transaction volume from the blockchain data alone.
- Blockchain.info provides both the misleading artificially inflated figures at <http://blockchain.info/charts/output-volume> and their estimation of the actual transaction volume by their own (imperfect) proprietary method cf. blockchain.info/charts/estimated-transaction-volume,

Fiction Volume vs. Approximated Corrected One



*Why Is It Difficult To Estimate?

- Again truly accurate estimations are impossible to obtain.
 - A particular problem are the actions of some bitcoin addresses which hold very large balances and return change to themselves at new freshly created addresses.

Source:

Nicolas Courtois: [On The Longest Chain Rule and Programmed Self-Destruction of Crypto Currencies](http://arxiv.org/abs/1405.0534) <http://arxiv.org/abs/1405.0534>

One Way To Measure Bitcoin Adoption in Payment

Anybody willing to pay transaction fees?



Fees In Dollars - Better

Relatively stable recently



Competition After Bitcoin [2014]

Alternative payments business is booming, growing 3%/year [McKinsey], faster than normal banking business, banks are almost totally absent!.

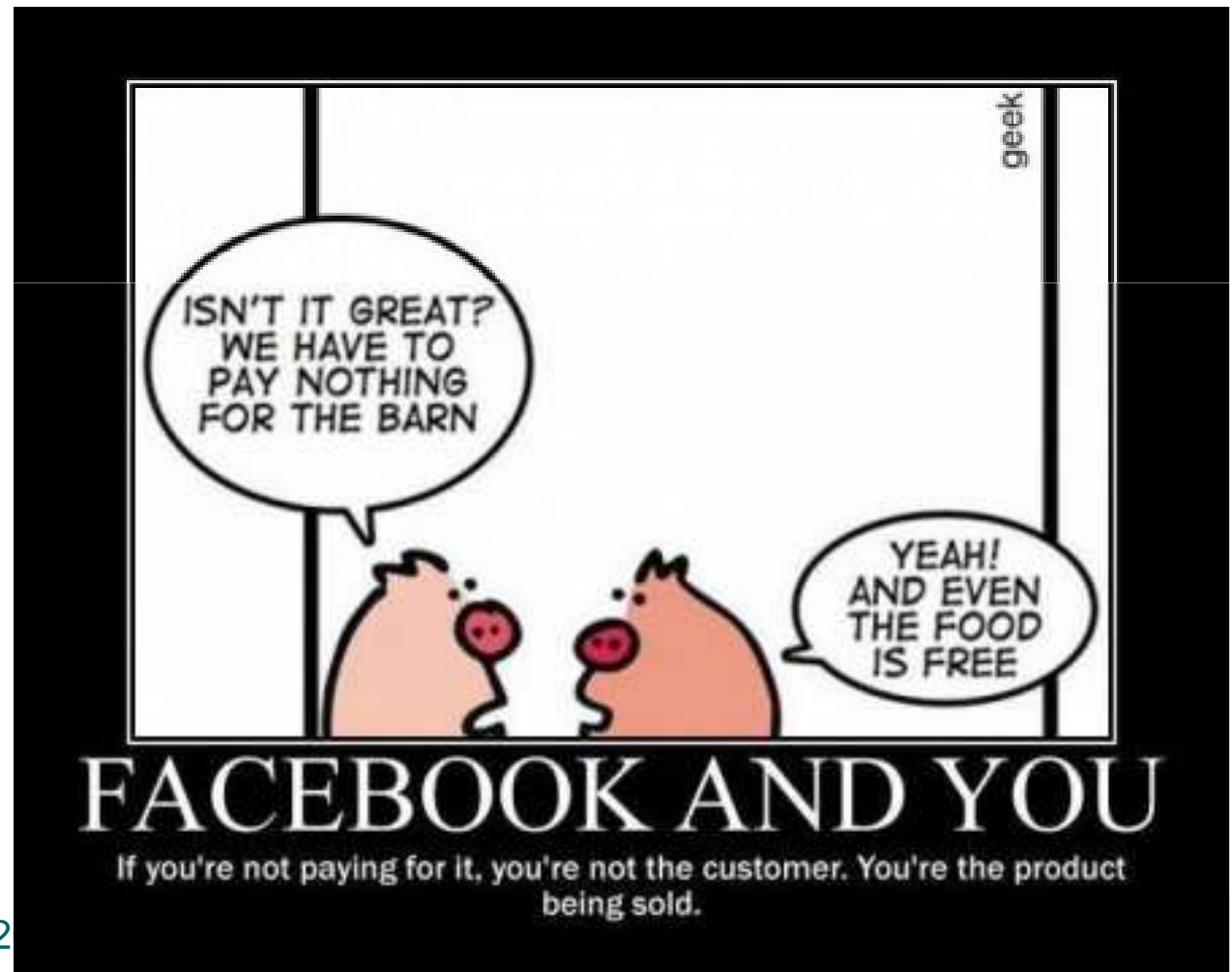
- Google wallet app and Amazon FPS allow to transfer money between customers
- Walmart, big telcos and many banks are developing their M-payment schemes in order to avoid Mastercard Visa etc fees...
- In Kenya, 43% of GDP transits through M-PESA, mobile phone system which is also a front-end to banks where banks play a secondary role.
- PayPal president's David Marcus:
 - initially they wanted to be independent from central banks and govts...
 - finally decided to become a bank, to become the biggest bank in the world?
 - has handled 180 billions in payments last year, 143 M customers
- Square new service - example: at coffee shop:
 - no signatures, no cards, no barcodes
 - check in when you enter the store
 - tell cashier your name and that you are using square!
 - the store manager has your picture displayed, he knows it is you
 - the customer receives a text with the amount paid, for him to check

Is Bitcoin Dead?

Not at all!

Key Problem:

After few brief episodes of capitalism,
modern business favours slavery.



Bitcoin!

A payment system in which

- it is THE PAYER who initiates the transaction
- controls the amount being paid
- money and payments are stored outside of the banking system [most recent systems erode the dominant position of banks]
- money cannot be confiscated [cf. Cyprus banks].
- it challenges fractional reserve banking [new!] and forces finance to become more “transparent”

“Troubled” bitcoin [The Economist May 2014]
is certainly is here to stay

=> but now must face all sorts of competition and technical reforms [our work]

Bitcoin vs. Fractional Reserve Banking



Abolish Fractional Reserve Lending?

Financial Times columnist Martin Wolf [24 Apr 2014]:

Strip private banks of their power to create money!

He proposes that

- the state, not banks, would create all money
- banks should be confined deposits/lending
- separation of
 - the provision of money [state]
 - the provision of finance [private sector].

<http://www.ft.com/cms/s/0/7f000b18-ca44-11e3-bb92-00144feabdc0.html#axzz34H2zdhPn>

He also writes: This will not happen now. But remember the possibility.

When the next crisis comes – and it surely will – we need to be ready.

Related: Full Reserve Banking (Sovereign Money, Chicago Plan,, Kaminska: The time for official e-Money is NOW!)

****Q: Can One Circumvent Bitcoin Monetary Policy?**

Idea:

Rent unused bitcoins for a short time => increase monetary supply.

How to guarantee that they are returned?

Maybe implement “fractional randomized reserve”? How???