

Digital Currencies & Central Banking

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Virtual (Digital) Currencies: Bitcoin

- (-) Private emission: No legal value guaranteed by a sovereign Government.
- (-) Decentralised governance & record-keeping: users control the currency.

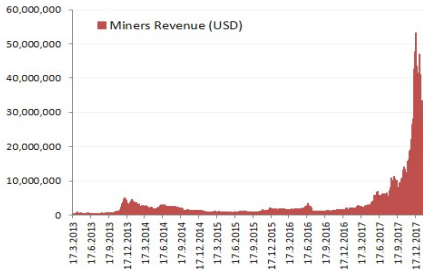
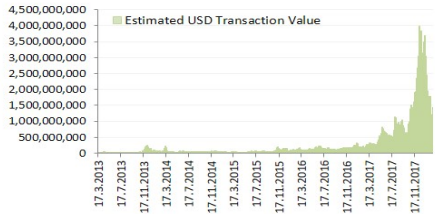
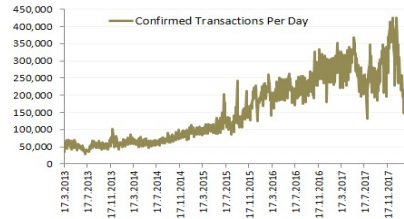
Characteristics that Motivate Users.

- (a) Anonymity, Simplicity & Low cost of transactions.
- (b) Promise of Constant Growth of Bitcoin in Circulation.
- (c) Expectations of quick profits due to upward price trend.

Bitcoin Infrastructure: Blockchain Technology

- (i) Decentralised Electronic Payment System:
cryptographic hash function: identification & integrity verification
- (ii) '*Miners*': computer servers enter & exit on basis of profit opportunities.
- (iii) System Rules set by Protocol: All miners follow.

Bitcoin Facts



Source: blockchain.info

Relative Advantage of Gold as Store of Value

Gold:

(1) Liquid Market

- Market Value = 250 bio USD
- Stable Demand in Investment Portfolios

(2) Limited supply

- Annual Growth = 1.5-2%
- (i) High stock (180-200 '000 tons; CB reserves:33,000 tons)
- (ii) Difficult Extraction

Advantages of Gold

- (a) Stable Price of Gold (STD.Gold: 17% -vs- STD.Bitcoin: 1372%)
- (b) Highly Liquid Market
- (c) Regulated, Stable market (vs-New Decentralized Bitcoin Market)
- (d) Self correcting supply due to stock of jewelleries

Source: blockchain.info; US Geological Survey

Bitcoin:

(1) Growing Market liquidity by number of transactions

- Volume of transactions= 200-400 '000 transactions/day;
- Market Value= 05-4 bio USD

(2) Limited supply

- Pre-Determined growth rate (currently 3.9%; 2020+ = 2%)
- Maximum Stock = 21 Million in 2140

Bitcoin Advantages:

- i. Status as Means of Payment: Easy & low cost transactions
- ii. Anonymity: allows users to not be supervised
- iii. Fast Growing Market due to (i) and (ii);
- iv. Status as Store of Value due to limited supply (and (i) - (iii))

Benefits and Costs as Means of Payment & as Store of Value

Type of Cost	Gold - Precious Metals	Fiat Currencies	Bitcoin (Virtual currencies)
Storage costs (annual)	0.1% - up to - 1%*	Subsidized by CB	Free, 100 % reserve money
Transportation	Very Costly	Inconvenient, legal obstacles	Free & Easy
Security	Physical	Institutional	Cryptographic
Record Keeping	Manuale (Labour cost)	Manuale (Labour cost)	Automatic
Counterfeiting	Impossible	Inevitable	Impossible
Issuance	Mining	Political	Algorithm (predictable & fixed)
Payment Clearing	Expensive	Centralized	Cheap & Decentralized
Scarcity	High	Arbitrary	Fixed: 21 million BTC
Authentication	Expensive assay	Trust counterparty	Built-in (inherent)

Source: Rochard (2013), World Gold Council, blockchain.info;

(Hypothetical) Adopting Bitcoin 100% as Means of Payment & Store of Value

Hypothetical substitution of Money in an economy make it impossible to implement MP.

	Supply of Bitcoin (y-o-y)	Economic Growth	Inflation [b]	[a]- Real Interest rate (fixed) R^R	Nominal Rate R^N (implied)
	[a]	[b]	[c]	[d]	[e]
2020	1.79%	4%	-2.21%	3%	0.79%
2024	0.83%	4%	-3.17%	3%	-0.17%
2030	0.40%	4%	-3.60%	3%	-0.60%
2040	0.05%	4%	-3.95%	3%	-0.95%

Source: blockchain.info & Ilogaritje.

Assumes Bitcoin substitutes 100 % of domestic currency.

Impact on Broad Money of 1 Lek Migrating to Virtual Currency.

For 1 Lek (hypothetical) migrating from Deposits to Bitcoin,
Broad money would be 3.4 Lek smaller after 10 periods.

Currency Outside Banks/Broad Money [1-k]	Required Reserve Ratio [rd]	Nr. of Periods	Money Multiplier
[b]	[c]	[e]	[f]
20%	10 %	4	2.6
		10	3.4
		20	3.6
20%	5 %	4	2.8
		10	3.9
		20	4.1

Market Value of Bitcoin as % of Monetary Base

Bitcoin Market Value is a tiny fraction (%) of Monetary Base of World Economy

Bitcoin Market Value as (%) of Monetary Base of World Economy					<u>Relative size</u>
	2014	2015	2016	2017	GDP / World GDP Ratio (2017)
Group of G7 & Euro area (%)	0.05	0.07	0.15	1.88	52
Group of G7, Euro area, BRIC (%)	0.03	0.05	0.1	1.29	74
World Economy (as %)	0.02	0.03	0.07	0.96	100