



M.A. Thesis Presentation

# Blockchain Technology as A Mean to International Integration:

A comparative study of Permissionless Blockchains (Bitcoin & Ethereum) from 2009 to  
2018

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Chapter 2: Literature review on Blockchain and cryptocurrency

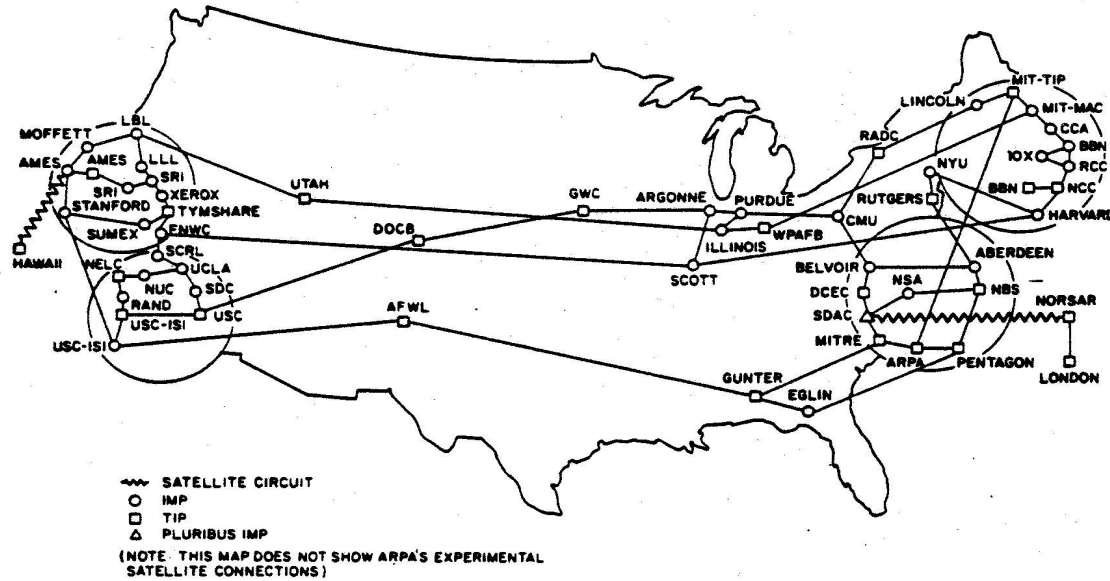
Chapter 3: Analysis of emerging technology

Chapter 4: Analysis of blockchain technology

Chapter 5: Analysis of the results

Chapter 6: Conclusion

# The Map of Internet in the 80s



Source: <https://www.are.na/block/343510>

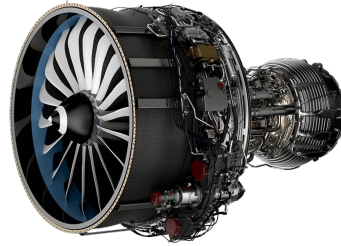
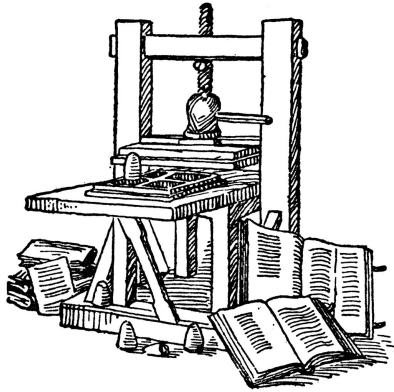
- \* “Paradigm”

- \* 1994: "Today Show": "What is the Internet, Anyway?"

- \* Question is: Do we have a paradigm which is the next big thing, in front of us that we do not clearly understand?

- \* What are the gaps a paradigm filled in the past?

**Filled the knowledge gap**  
**> transferred knowledge**  
**> changed perception**  
**Printing Press (1400)**



**Engine/ Industrial  
Revolution (1800)**  
**> abolished slavery**  
**> revolution**  
**Filled the power gap**

**Filled the distance gap**  
**> made world smaller**  
**> communication**  
**Internet (1900)**



Let's Imagine We want to Buy a House



In Traditional Ledger Transaction (Tx) history will look like this

007	50K Investment	1993
006	Sold to Owner 3	1992
005	Failed Inspection	1992
004	Sold to Owner 2	1989
003	Approved Extension	1980
002	20K Improvement	1980
001	Sold to Owner 1	1976

Ledger

## Traditional Ledger is Highly Temperable

008	Electrical Fire	2001
007	50K Investment	1993
006	Sold to Owner 3	1992

004	Sold to Owner 2	1989
003	Approved Extension	1980
002	20K Improvement	1980
001	Sold to Owner 1	1976

Ledger

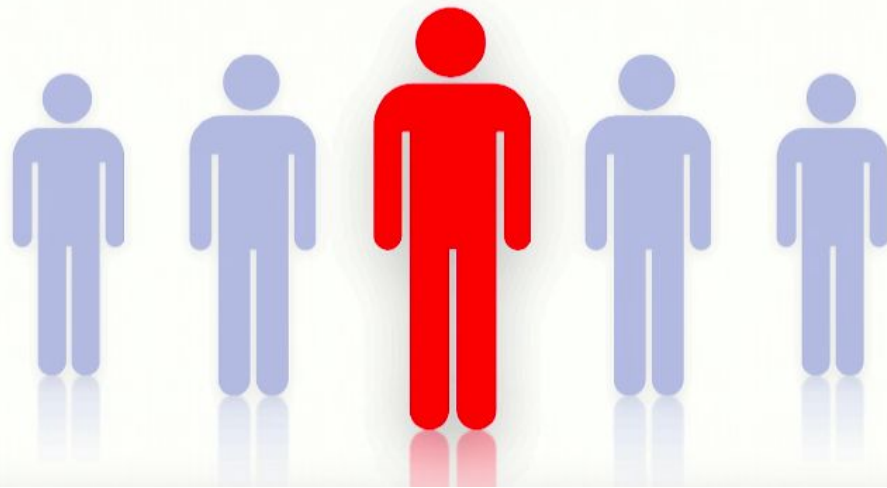


## Traditional Ledger is Highly Temperable

008	Electrical Fire	2001
007	50K Investment	1993
006	Sold to Owner 3	1992
005	New Chimney	1992
004	Sold to Owner 2	1989
003	Approved Extension	1980
002	20K Improvement	1980
001	Sold to Owner 1	1976

Ledger

## THE MIDDLEMAN



- \* In the current world we have intermediaries that generate this trust.
  - \* Banks, Credit Agencies, Title Companies
  - \* Banks are vulnerable to attack, hack and many other threats
- \* There is more than 2.5 billion people in the world who do not have access to any financial services.
- \* Blockchain is Trustless , distributed, decentralised, immutable
  - \* Blockchain --> verification

## This How Blockchain Records Transactions (Tx)

Builder	001	Sold to Owner 1	1976	
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Blockchain Ledger









## This How Blockchain Records Transactions (Tx)

Owner	002	20K Improvement	1980	
Builder	001	Sold to Owner 1	1976	

Blockchain Ledger

## This How Blockchain Records Transactions (Tx)








Insurance	008	Electrical Fire	2001	
Contractor	007	50K Investment	1993	
Real Estate	006	Sold to Owner 4	1992	
Real Estate	005	Sold to Owner 3	1992	
Real Estate	004	Sold to Owner 2	1989	
Architect	003	Approved Extension	1980	
Owner	002	20K Improvement	1980	
Builder	001	Sold to Owner 1	1976	

Blockchain Ledger

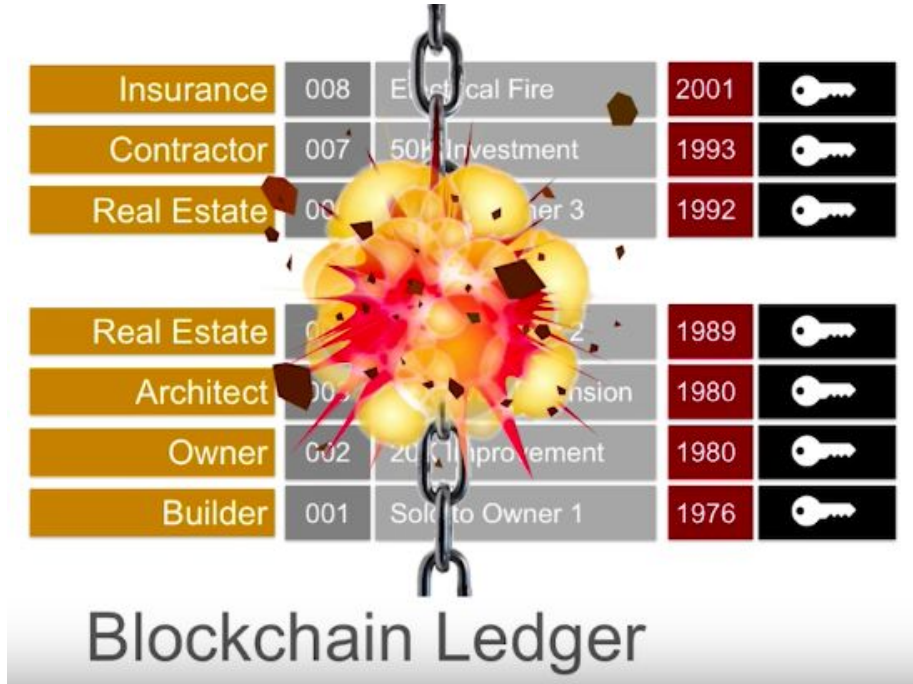
## Blockchain is Immutable and Tamper Proof



Insurance	008	Electrical Fire	2001	
Contractor	007	50k Investment	1993	
Real Estate	006	Sold to Owner 3	1992	
Real Estate	004	Sold to Owner 2	1989	
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Owner	002	20k Improvement	1980	
Builder	001	Sold to Owner 1	1976	

Blockchain Ledger

## Blockchain is Immutable and Tamper Proof



**Immutable**



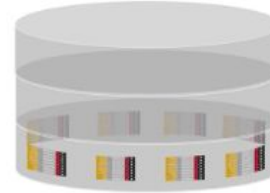
## Traditional Ledger vs Blockchain



Tamper-able + Centralized

Trust but verify,  
requiring slow  
intermediaries

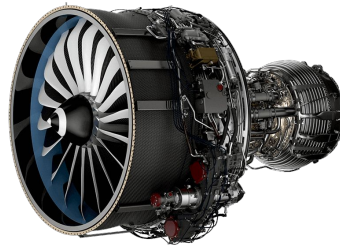
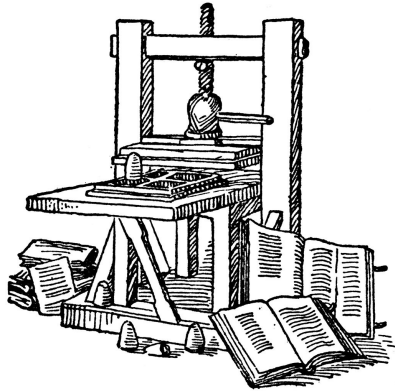
VS



Immutable + Distributed

Trusted, immediately  
recorded and easily  
available

**Filled the knowledge gap**  
**> transferred knowledge**  
**> changed perception**  
**Printing Press (1400)**



**Engine/ Industrial  
Revolution (1800)**  
**> abolished slavery**  
**> revolution**  
**Filled the power gap**

**Filled the distance gap**  
**> made world smaller**  
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**Internet (1900)**



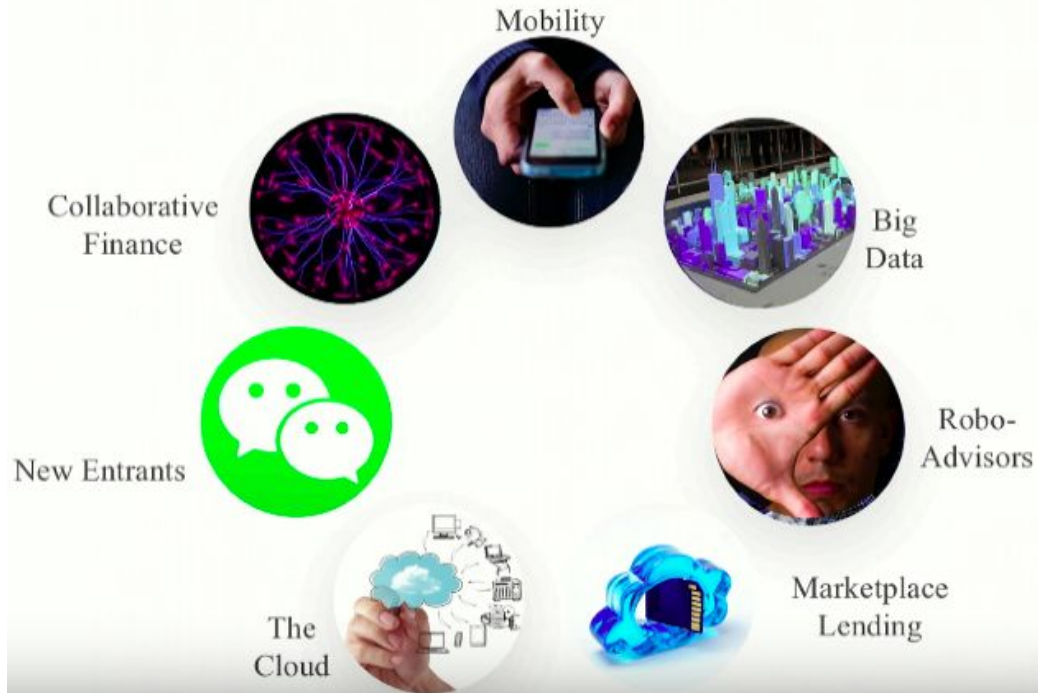
**Fills the trust gap**  
**Changes the way of  
Trusting each other**  
**Revolutionises finance**

Summary of this part:

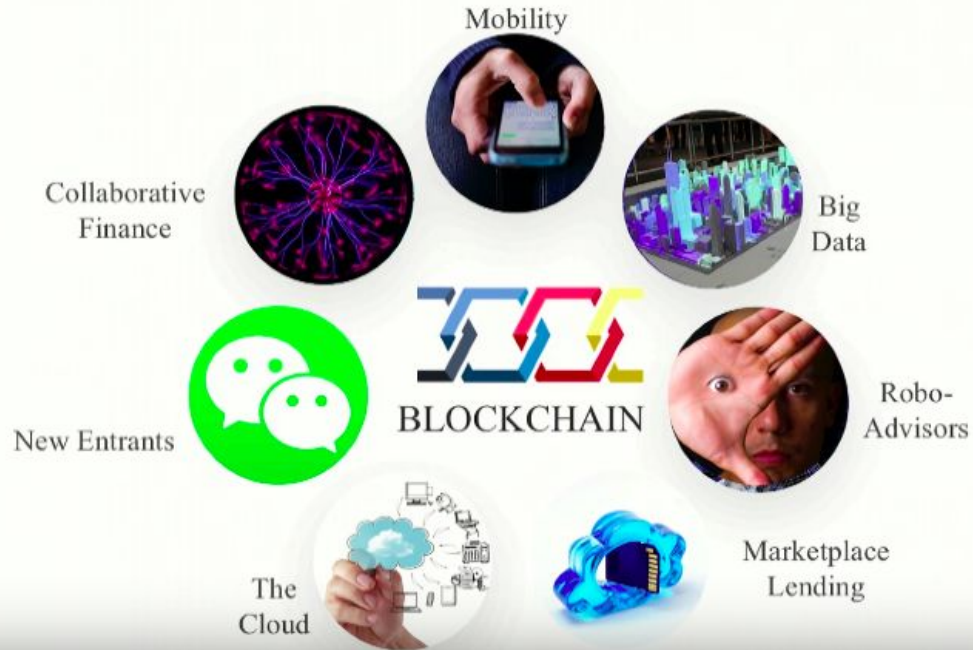
- \* Blockchain - “Distributed (Decentralised) Ledger” carrying information of value: who owns what.
- \* Blockchain - Removes the middle man with a peer to peer network
- \* Blockchain - Fills the trust gap, transparent



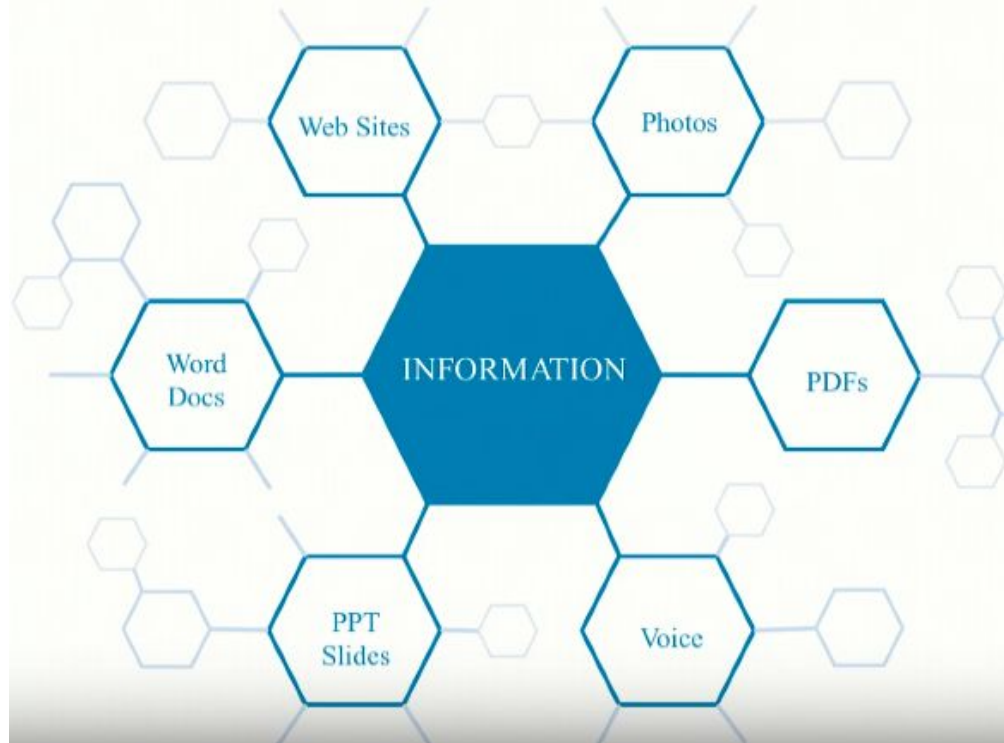
# THE FINTECH REVOLUTION



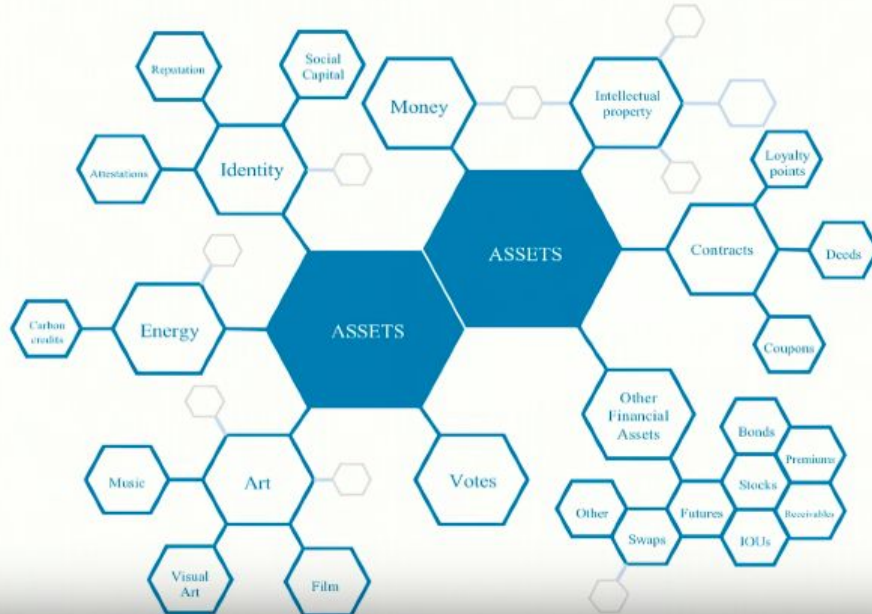
# THE FINTECH REVOLUTION



# THE INTERNET OF INFORMATION



## THE INTERNET OF INFORMATION ► THE INTERNET OF VALUE





Use case scenarios: Literally any third party based industry

### Finance

- \* Real Estate
- \* Financial Services (Bank)
- \* Decentralised Internet (Golem, Substratum)

### Retail banking

- \* Cross border remittances (Bitcoin, Ripple, Litecoin, etc)
- \* Mortgage verification, Mortgage contracts (smart contract) (Ethereum, EOS, Cardano, NEO, Lisk, Stratis, etc)

### Public record (Factom)

- \* Vehicle registration
- \* Certificates ie. marriage, birth, degree etc
- \* Business license and ownership records

## Blockchain

- Blockchain is a form of immutable borderless, censorship resistant ledger with continuous updating record of transactions, smart contracts, code, laws etc. mainly used by cryptocurrencies. (World Trade Organisation)
- Some of the most famous open blockchains that are well knowns are Bitcoin(2009), Ethereum, Litecoin etc.
- Blockchain is also known widely as the web 3.0

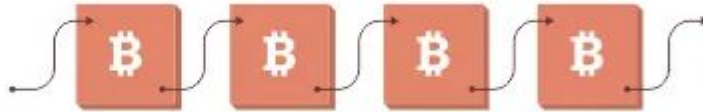
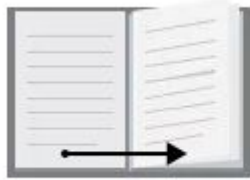
## Blockchain Web 3.0

- Blockchain is an emerging technology <sup>1</sup> that revolutionises how everyone trades and interacts with each other.
- It provides unique properties of allowing mutually mistrusting entities to exchange economic values without depending on trusted third party by utilising law of mathematics and cryptographic game theory <sup>2</sup>.

- 
1. According to world economic forum, the blockchain, Internet of things and artificial intelligence are one of the few new disruptive emerging technologies.  
“Meyerson, B. and DiChristina, M. (2016). *Top 10 Emerging Technologies of 2016*. [online] Available at: [http://www3.weforum.org/docs/GAC16\\_Top10\\_Emerging\\_Technologies\\_2016\\_report.pdf](http://www3.weforum.org/docs/GAC16_Top10_Emerging_Technologies_2016_report.pdf) [Accessed 28 Nov. 2018]”
  2. See Appendix of “Hileman, Dr. G. and Rauchs, M. (2017). *GLOBAL CRYPTOCURRENCY BENCHMARKING STUDY 2017*. [online] Cambridge Centre for Alternative Finance, University of Cambridge. Available at: <https://bit.ly/2o3zHcW> [Accessed 28 Nov. 2018]”

# Blockchain Web 3.0

- In simplest analogy Blockchain is like book and its pages are the blocks and each pages are chained together to form a blockchain.



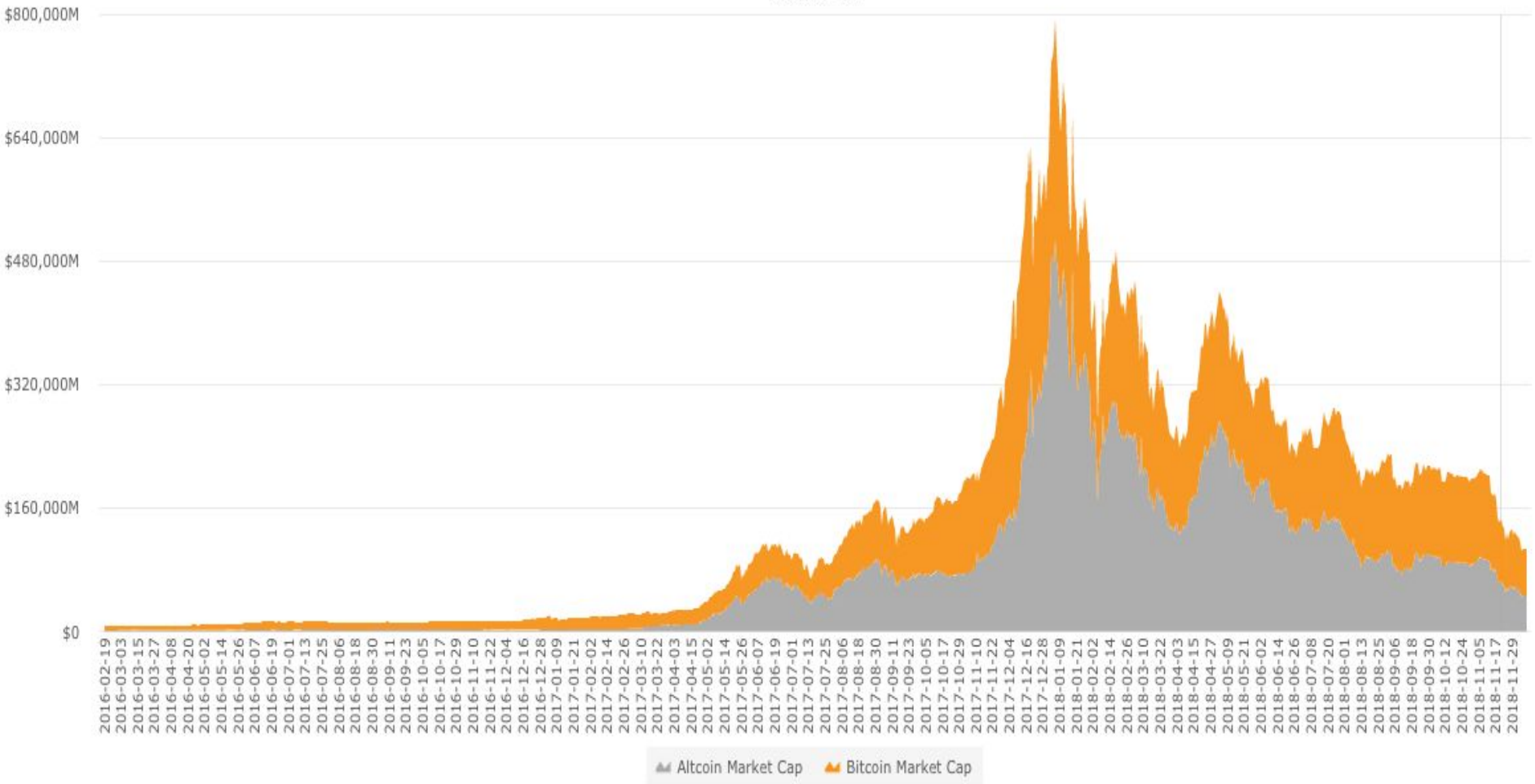
- Source: antonylewis2015, V. (2015). *A Gentle Introduction to Blockchain Technology – Bits on Blocks*. [online] Bits on Blocks. Available at: <https://bitsonblocks.net/2015/09/09/gentle-introduction-blockchain-technology/> [Accessed 1 Dec. 2018].

# Where is it disrupting?

- According to this research paper conducted by ETH Zurich and Imperial College London  
Wust, K. and Gervais, A. (2017). *Do you need a Blockchain?*. [online] ETH Zurich & Imperial College London. Available at: <https://eprint.iacr.org/2017/375.pdf> [Accessed 1 Dec. 2018].
  - Blockchain is suitable for any applications where multiple parties are involved and the trust element is present.
  - The paper analysed three main use cases: 1. Supply Chain Management, 2. Interbank and International Payments, & 3. Decentralised Autonomous Organisation (DAO)

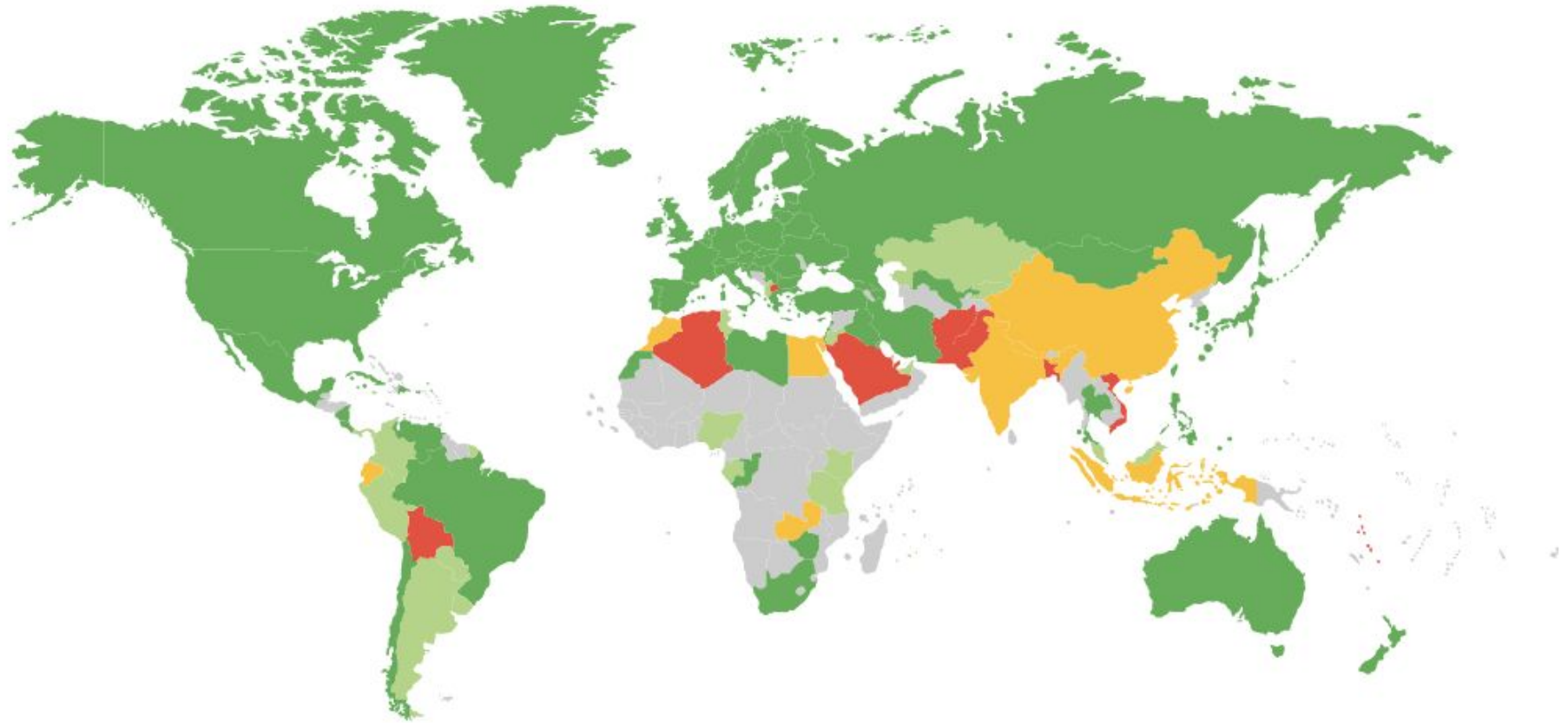
# Cryptocurrency Market Caps (historical)

coin.dance



# Bitcoin Legality by Country

coin.dance



Legal Alegal Restricted Illegal Unknown

# Countries where Bitcoin is unrestricted

- 110/251 countries Cryptocurrency is unrestricted.

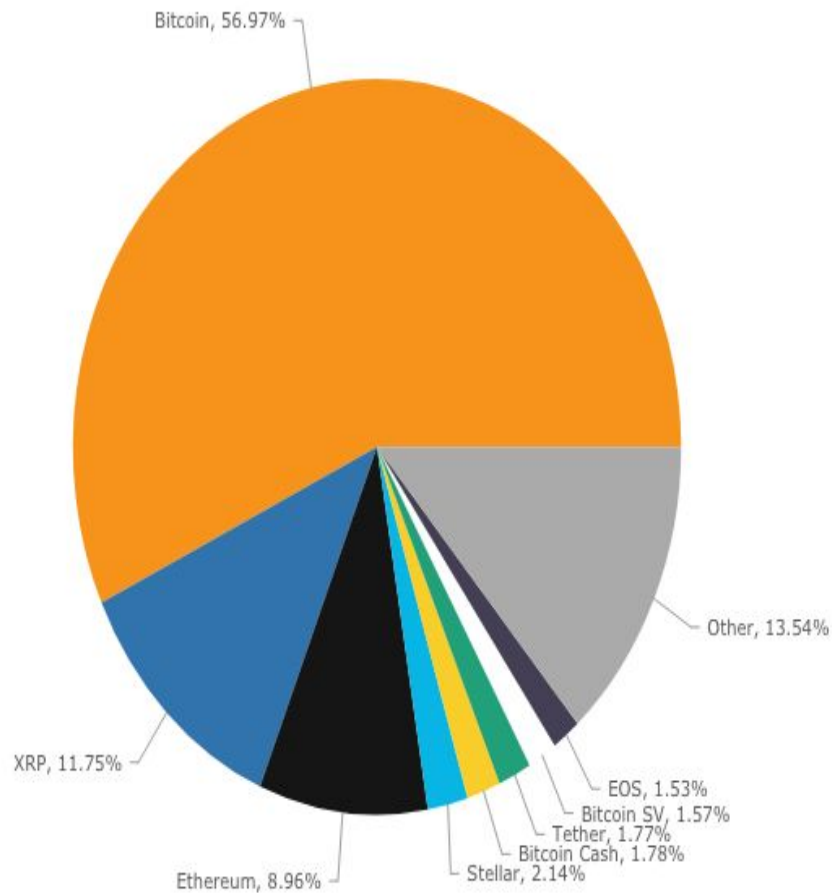
Number of countries	Classified as
52 (UK, Japan etc)	Currency
28 (France, Israel, Hong Kong, etc)	Commodity
7 (USA, Argentina, etc)	Property
23	Unclassified

- Source: coin.dance



## Cryptocurrencies by Market Cap

coin.dance



Bitcoin XRP Ethereum Stellar Bitcoin Cash Tether Bitcoin SV EOS Other

# Literature Review

- The research that had been conducted before mainly focussed on International Trades
- 1. Werbach, K. (2018). *Trust, but Verify: Why the Blockchain Needs the Law*. [online] Berkeley Law Scholarship Repository. Available at: <https://doi.org/10.15779/Z38H41JM9N> [Accessed 6 Dec. 2018].
- 2. [https://www.wto.org/english/res\\_e/booksp\\_e/blockchainrev18\\_e.pdf](https://www.wto.org/english/res_e/booksp_e/blockchainrev18_e.pdf)
- 3. [http://www.uncitral.org/pdf/english/congress/Papers\\_for\\_Programme/5-DE\\_CARIA-A\\_Digital\\_Revolution\\_in\\_International\\_Trade.pdf](http://www.uncitral.org/pdf/english/congress/Papers_for_Programme/5-DE_CARIA-A_Digital_Revolution_in_International_Trade.pdf)

# Statement of the problem

- Blockchain technology is a new technological revolution
- Blockchain can be compared to the Internet Revolution of 1990s
- By gathering data of permissionless blockchains; parallel with the data of internet revolutions can be made and can be proven that bitcoin and blockchain is here to stay

# Main Research Question

- Can blockchain be a decentralised solution to International Integration?
  - International Integration is a broad topic
  - In this study, I will primarily focus on economic integration

# Hypothesis

H1: Blockchain is receiving adoption because of **Financial Seclusion** of over 3 billion people from global market

- i. Blockchain is receiving adoption because people and non state actors **do not trust Financial Intermediaries** (i.e. banks, government etc)
- ii. Blockchain is receiving adoption because it provides non state actors opportunities to **Challenge and Compete With State** actors by forging their own tokens (currency, smart contract etc) of financial values.

H2: Blockchain is receiving adoption because of **Technological Evolution**

# Methodology

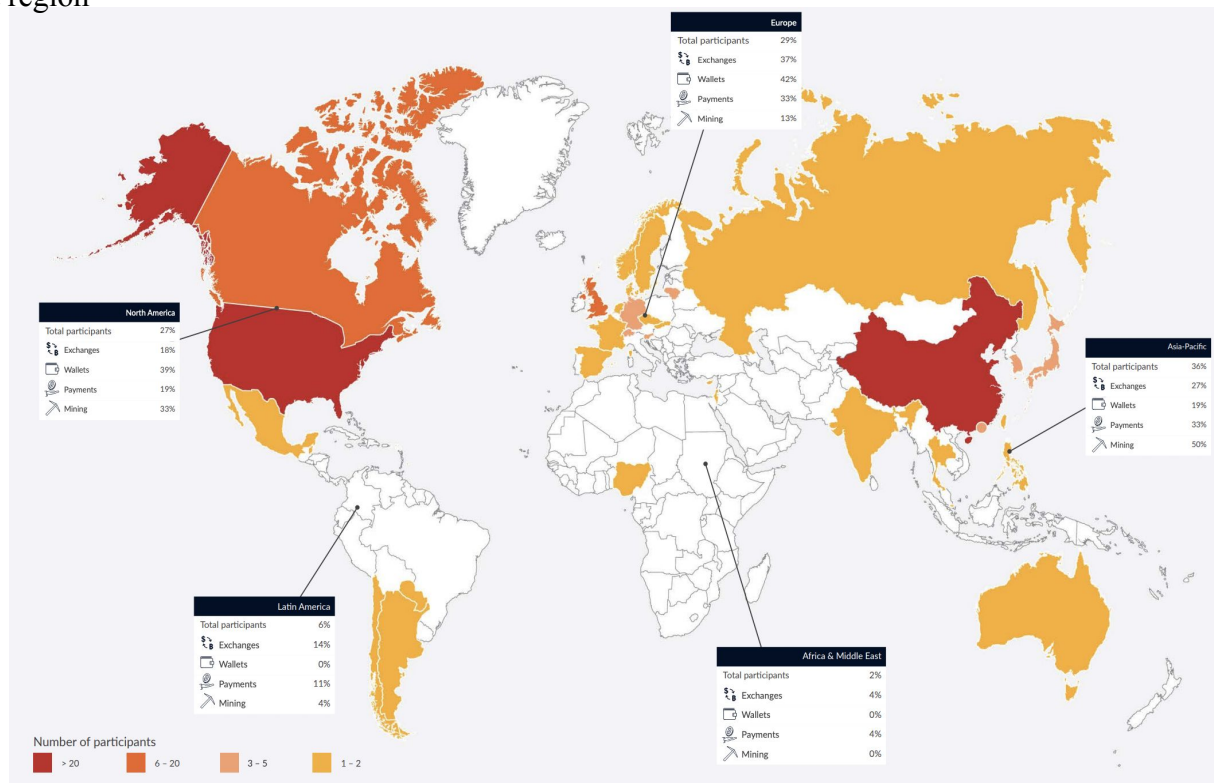
- I will implement mixed analysis
- Chapter 2:
  - Quantitative Analysis:
  - Source of data:
    - Newspapers and articles
    - Statistical data
      - Coin.dance, Bitcoinity & Governmental Bureau
      - Blockchain data (case study)
        - Bitcoin blockchain and BIP (Bitcoin Improvement Proposals)
        - Ethereum blockchain (Smart Contract Platform), EIP and ERC (Request for Comments)

# Cryptocurrency Benchmark Studies 2017 by University of Cambridge

Surveyed 38 countries in 5 different region

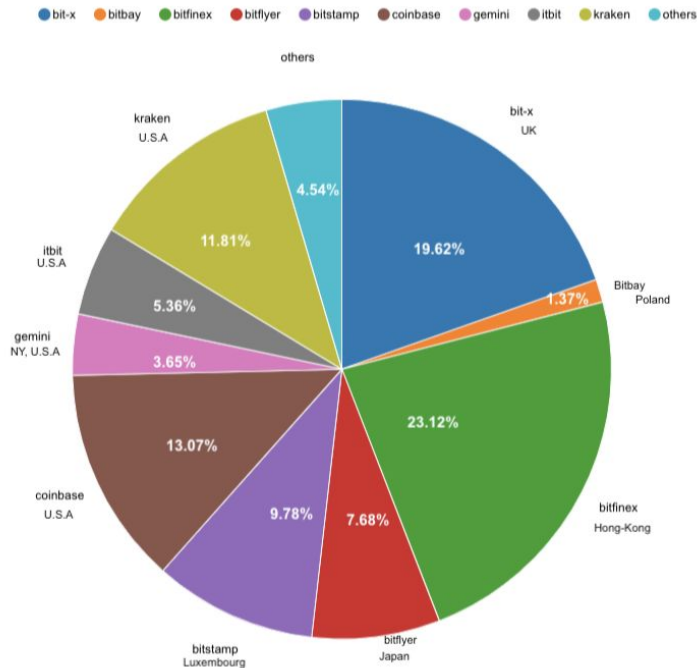
By Country	Participants
U.S.A	32%
China	27%
UK	16%
Canada	7%

By Region	Participants
Asia-pacific	36%
Europe	29%
North-America	27%
Latin America	6%
Middle East and Africa	2%

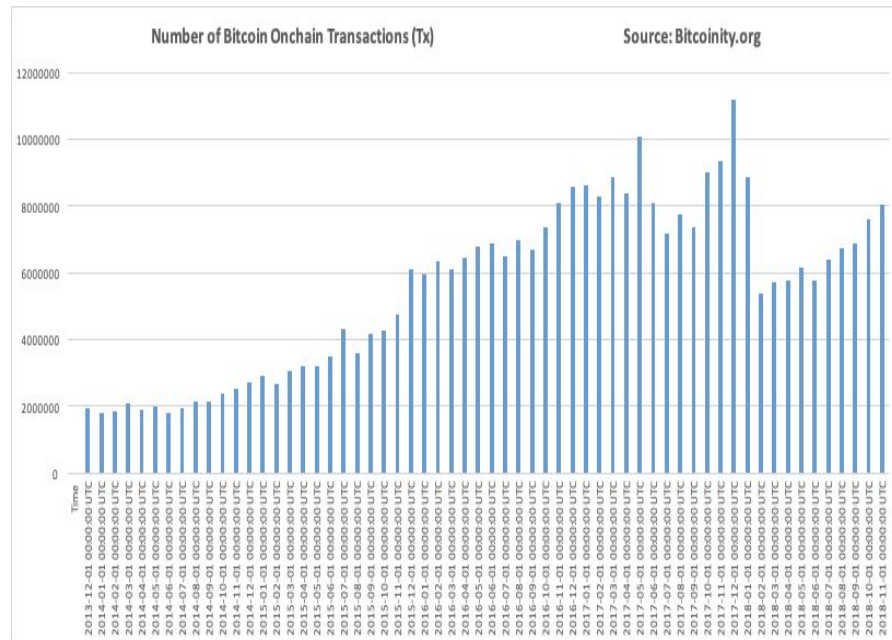


# Bitcoin statistics

Largest Bitcoin Exchange by daily volume (12th December 2018)  
(Source: Bitcoinity.org)

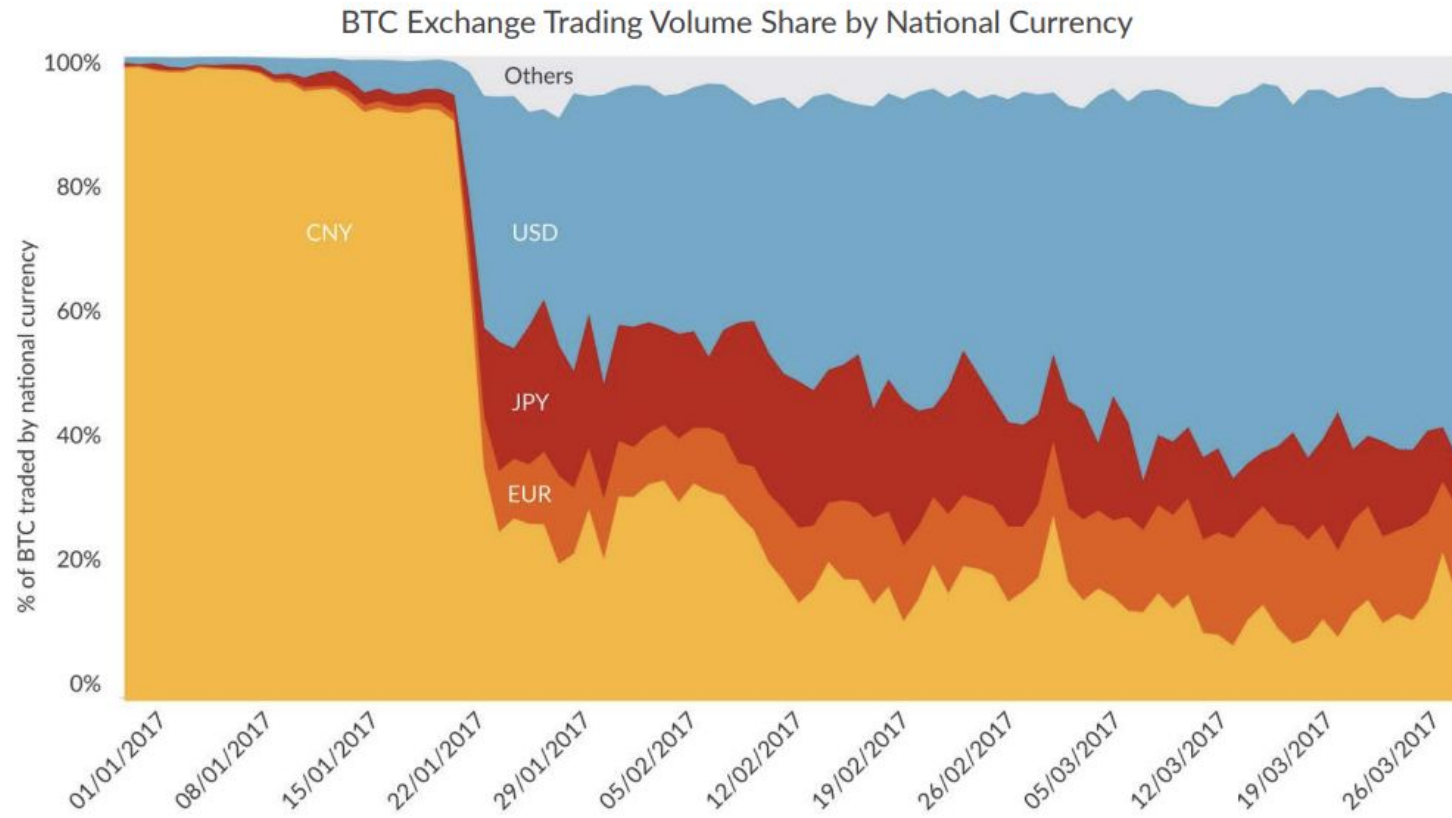


Number of Bitcoin Transactions Per Month Since 2013 to November 2018

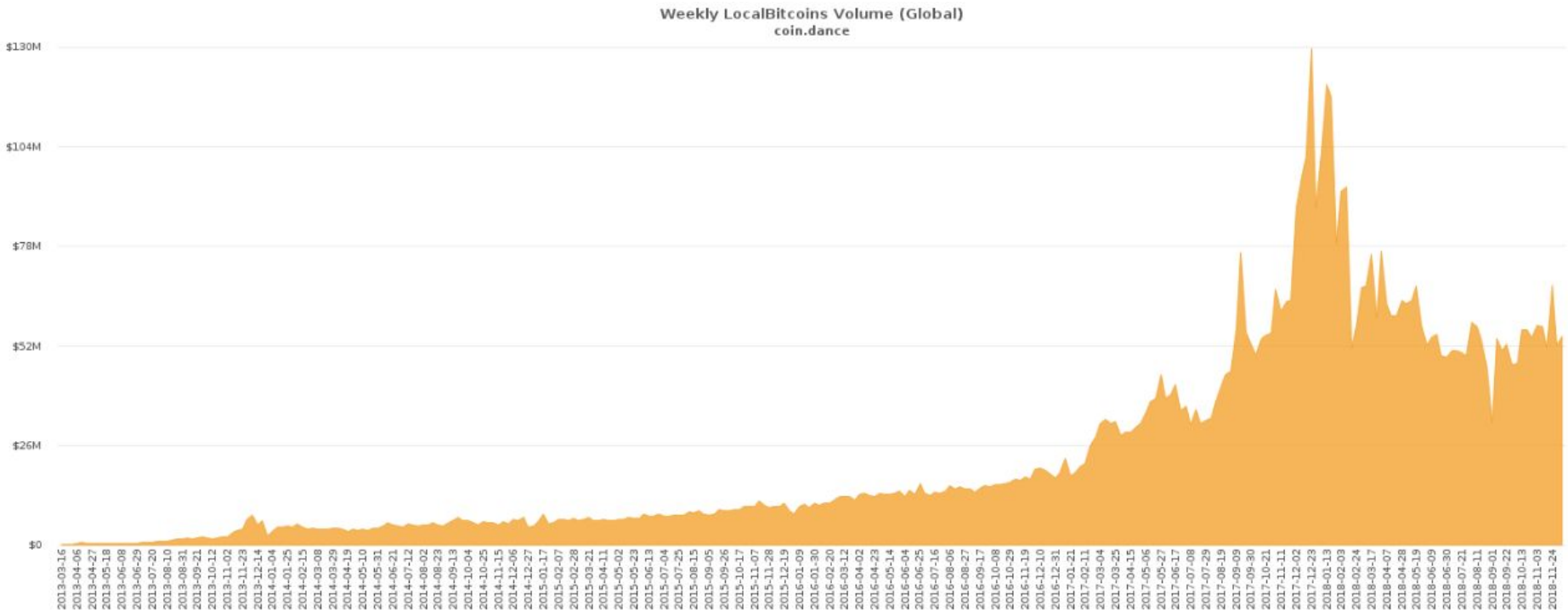




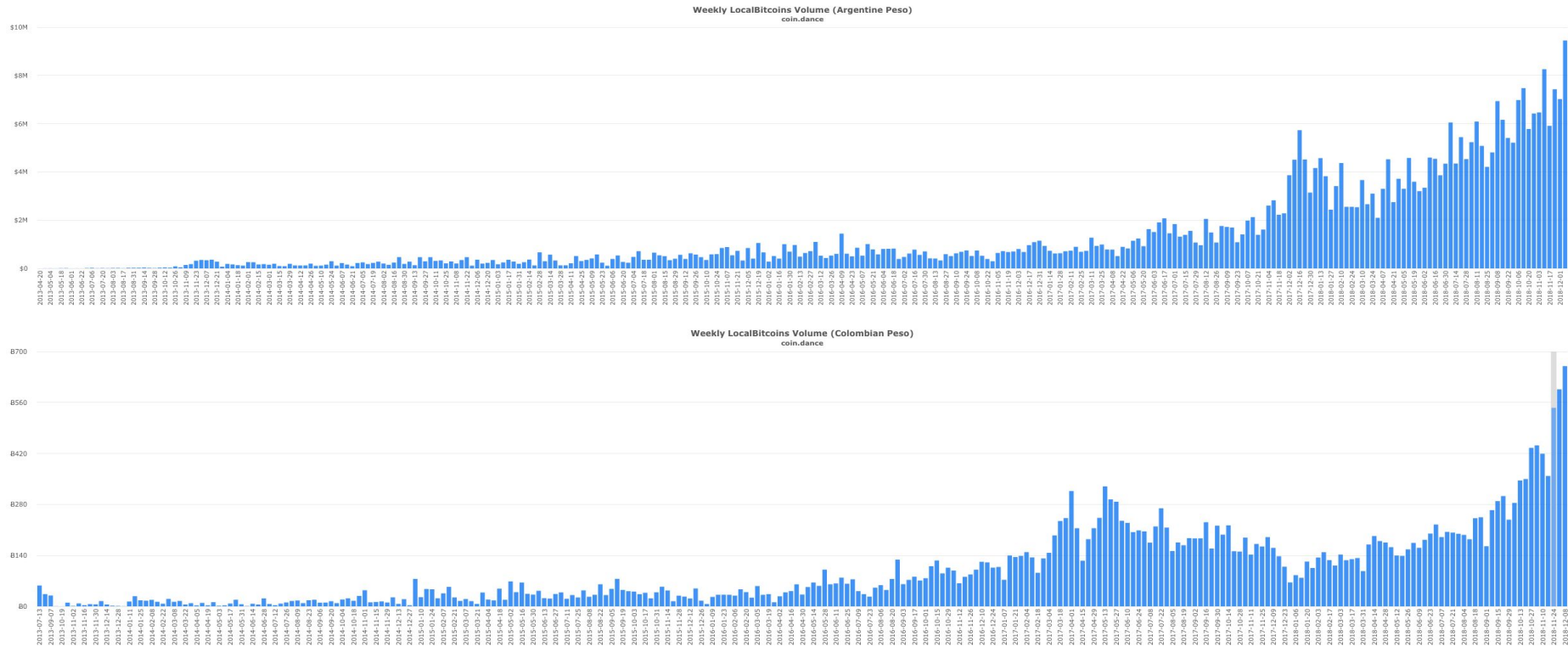
## Bitcoin statistics



# Bitcoin statistics

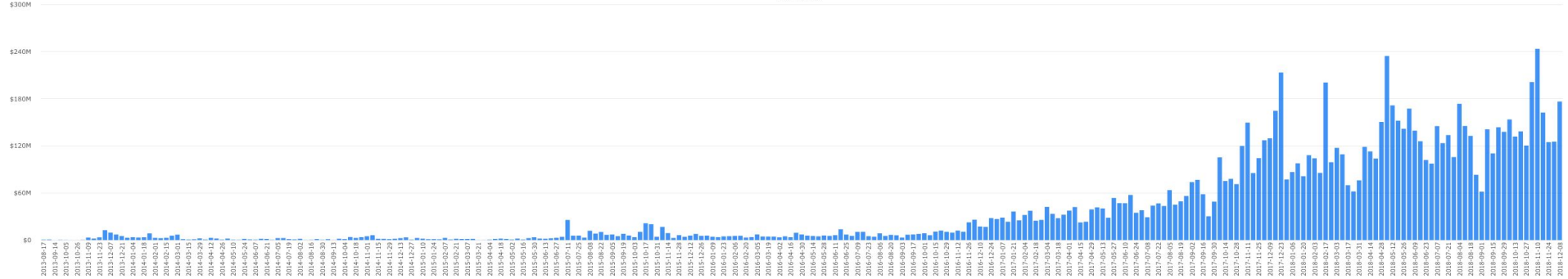


# Bitcoin statistics

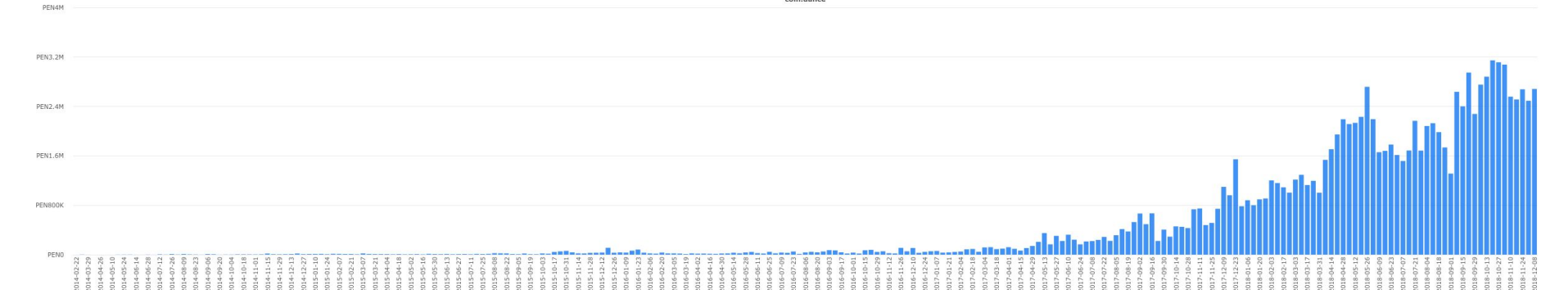


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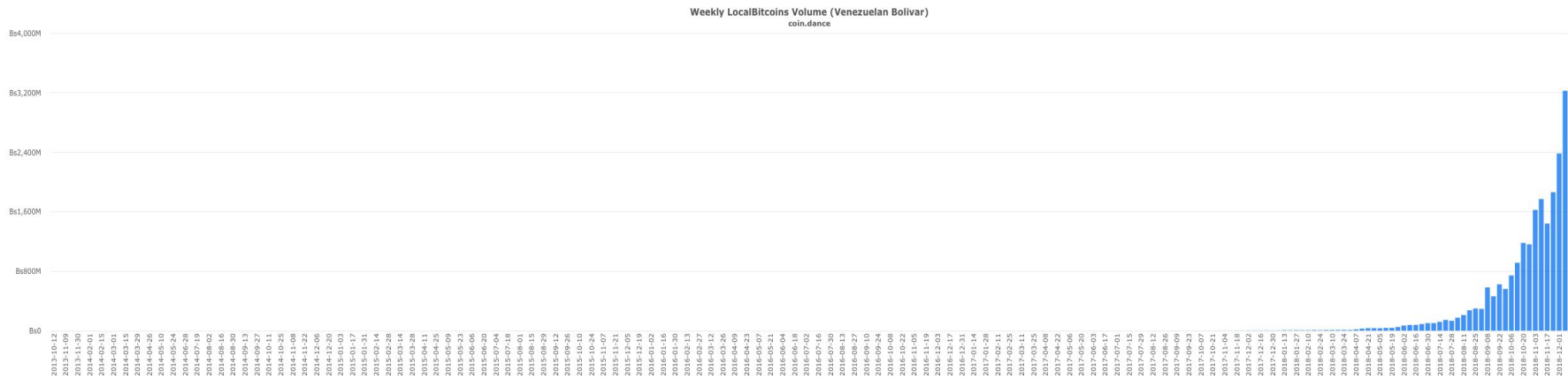
Weekly LocalBitcoins Volume (Chilean Peso)  
coin.dance



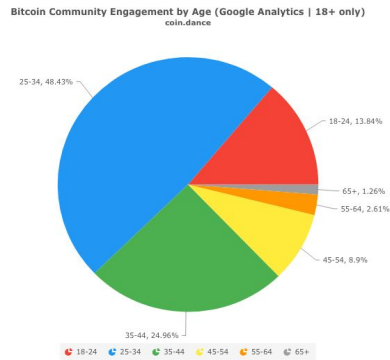
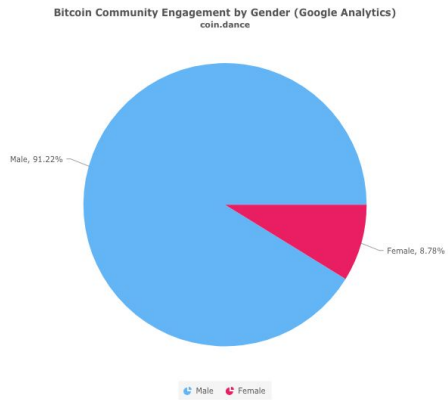
Weekly LocalBitcoins Volume (Peruvian Sol)  
coin.dance



# Bitcoin statistics



# Bitcoin statistics



# Methodology

- I will implement mixed analysis
- Chapter 3:
  - Qualitative Analysis:
    - Interviews, I will perform:
      - CEO of bitcoin.com, bitflyer, zaif and other Tokyo based blockchain facilitators
      - Blockchain startups like hardware wallets, software wallets providers
      - Successful ICOs (Initial Coin Offering) done in Tokyo

# Methodology

- According to WTO:
  - “Blockchains can be public, private or managed by a consortium of companies, and they can be accessible by everyone (permissionless) or restricted (permissioned)”
- I would mainly utilise the open permissionless blockchains (2008-2018) as source of my data
- I will also look into the growth of Ethereum Blockchain (2015-2018) to evaluate Smart Contracts, why it can be used more efficiently among governments



# Limitations of Study

- This particular field of technology is evolving rapidly
- Thus it is extremely difficult to track the data
- What is valid today, may not be valid tomorrow

# Limitations of Study

- According to World Trade Organisation (WTO), blockchain is being used by not only cryptocurrencies but also among cross government bids etc
- However, The research will mainly be highlight the
  - Economics of blockchain
- Political aspects such Anarcho-capitalism is beyond the scope of this research due to limited frame of time.

# Expected Results

- I would determine the results to be true positive:
- If,
  - The analysis trend matches with data with previous revolutions ie. Internet
  - The data correlates with financial seclusion, lack of access of banking, currency instability
  - Developing countries are using crypto. Because currency instability
  - Developed countries are using as speculation,
- Else,
  - For a type 1 error, I can decide that:
    - Nothing special is happening
    - People trust intermediaries thus private blockchains (e.g. XRP, Hyperledger etc) are receiving adoption
  - For a type 2 error, I can decide that:
    - Something special is happening
    - People do not trust intermediaries thus public blockchains are receiving adoption

## Schedule until final presentation

- January-February: Statistical Analysis of Bitcoin Blockchain and Ethereum Blockchain
- March: Surveys and Interviews of some of the Blockchain Thought Leaders
- April: Qualitative Data Analysis
- June: Conclusion and submit the final thesis

## Schedule

I am going to do hypo test on

\* Discretive stat, qualitative data, quantitative data from coin.dance etc

## Comments:

- Integrate the similar parts
- This tech. Is not
- Example of social usages, governmental usage (add as table)
- Governmental use cases\*\*

# References

Nakamoto, S. (2008). *Bitcoin: A Peer-to-Peer Electronic Cash System*. [online] Bitcoin.org. Available at: <https://bitcoin.org/bitcoin.pdf> [Accessed 1 Dec. 2018].

antonylewis2015, V. (2015). *A Gentle Introduction to Blockchain Technology – Bits on Blocks*. [online] Bits on Blocks. Available at: <https://bitsonblocks.net/2015/09/09/gentle-introduction-blockchain-technology/> [Accessed 1 Dec. 2018].

Meyerson, B. and DiChristina, M. (2016). Top 10 Emerging Technologies of 2016. [online] Available at: [http://www3.weforum.org/docs/GAC16\\_Top10\\_Emerging\\_Technologies\\_2016\\_report.pdf](http://www3.weforum.org/docs/GAC16_Top10_Emerging_Technologies_2016_report.pdf) [Accessed 28 Nov. 2018]”

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