Lukka

Making Crypto Assets Accountable

Pricing in Highly Fragmented Markets

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Presentation Outline

- How the crypto market works today
- Accounting challenges for crypto assets
  - Technical: Tracking and consolidation of crypto assets
  - Conceptual: Characterization of crypto as an asset class
- Lukka methodology for pricing crypto assets
  - Fair value
  - Dynamic determination of the principal market

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How Equity Markets Work

All transactions and **real time** positions

Net transactions and **end of day positions**

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How Equity Markets Work

NYSE

DTCC

All transactions and **real time** positions

accounting

Net transactions and **end of day positions**

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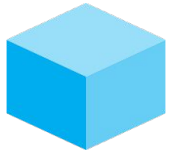
Transactions and Transfers



Blockchain Ledger

Investor crypto wallet

Exchange crypto wallet

Transfers in and out of wallet, **position at time of transfer**

Crypto Exchange

All transactions and **real time positions**

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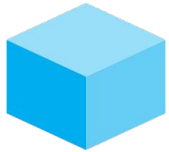
Transactions and Transfers



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Crypto Exchange

All transactions and **real time positions**

accounting

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Global Exchanges

- Crypto exchanges are spread across the globe
- Most venues trade crypto to crypto
- Few venues trade crypto to local fiat
- Many crypto assets trade on only a few venues

Implication for Accounting: $ value of intermediate transfers

USD-->BTC *BTC-->EOS* *EOS-->BTC* *BTC-->USD*

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Tax Reporting

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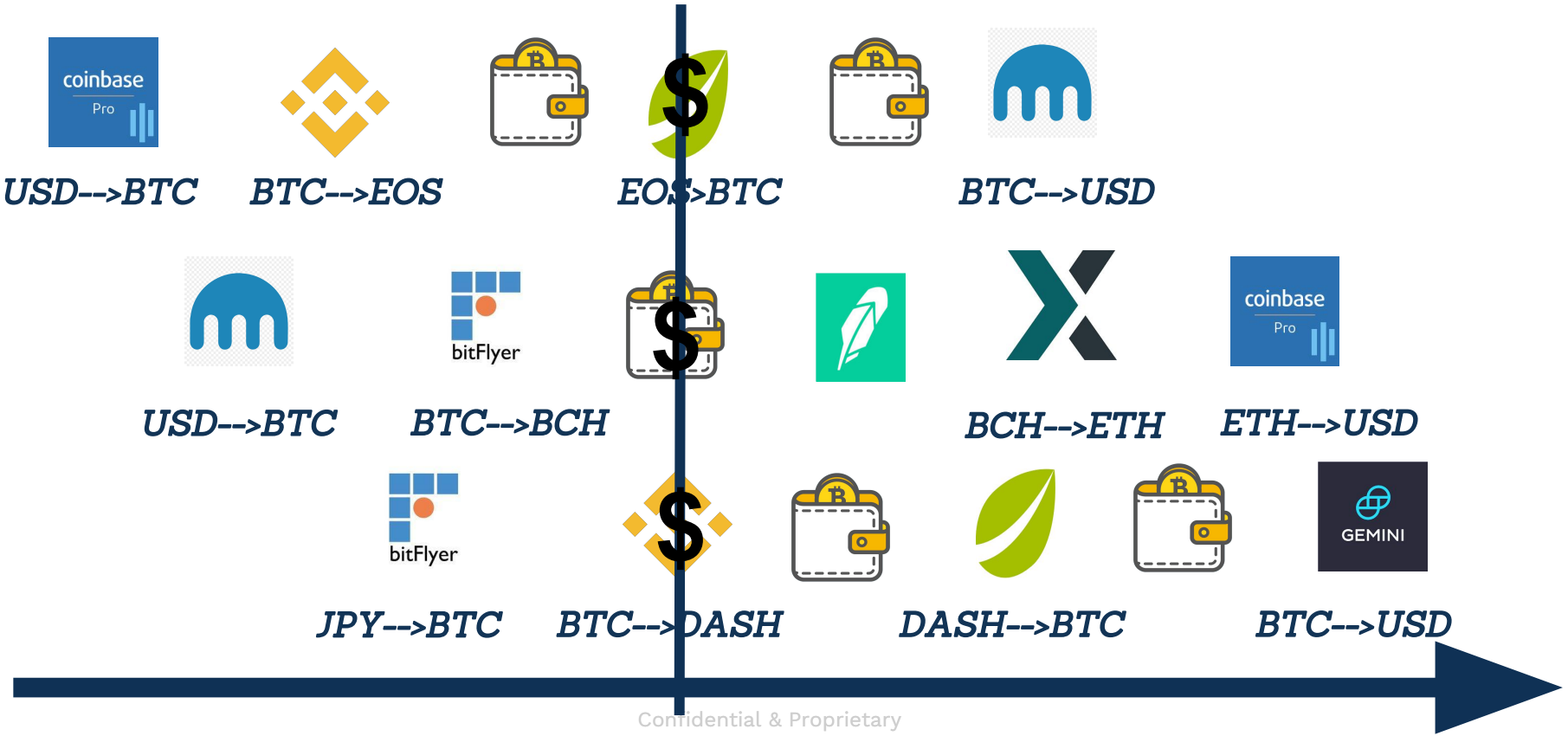
Implication for Accounting: $ value at a given point of time



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Implication

- Using only information available on the ledger would not meet the GAAP and IFRS standards
- For financial and tax reporting purposes information must be collected and consolidated from exchanges, wallets, custodians, OTC etc.
- Reports must be augmented with additional information, in particular conversion price reference

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Lukka - who we are

- Named after Luca Pacioli, the father of double entry accounting, Lukka is the leading crypto native middle and back office software and data service provider for institutions

- Lukka built the world's first crypto tax calculator in 2014 - LibraTax

- Customers include - Funds & Fund Administrators, OTC & Proprietary Trading Firms, Crypto Exchanges, Miners and Accounting Firms

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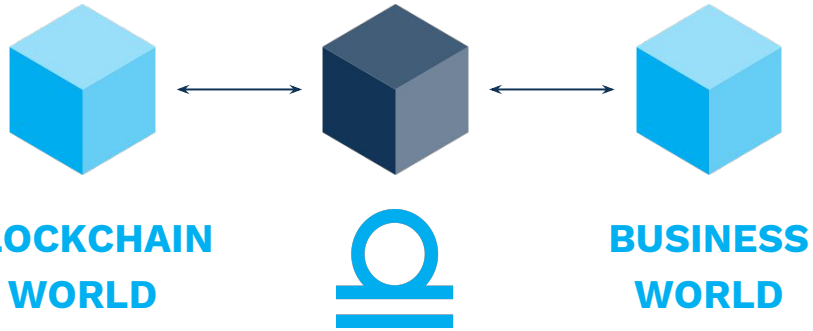
Lukka's Mission



Transform distributed and decentralized crypto asset data into auditable financial information to improve operations, create financial statements and provide regulatory reporting and transparency.

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IRS Note for Tax Reporting

Q-5: How is the ***fair market value*** of virtual currency determined?

A-5: For U.S. tax purposes, transactions using virtual currency must be **reported in U.S. dollars**. Therefore, taxpayers will be **required to determine the fair market value** of virtual currency in U.S. dollars as of the date of payment or receipt. If a virtual currency is listed on an exchange and the exchange rate is established by market supply and demand, **the fair market value of the virtual currency is determined by converting the virtual currency into U.S. dollars** (or into another real currency which in turn can be converted into U.S. dollars) at the exchange rate, in a reasonable manner that is consistently applied. An individual or entity subject to US tax laws must be able to evaluate his holding portfolio for financial reporting

(IRS Notice 2014-21)

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GAAP and IFRS Standards

- Presently, no formal accounting standards exist for cryptocurrencies under either US GAAP or IFRS
- Current practices vary but are moving towards accepting the fair value model
- A detailed discussion can be found in pricing white paper available on Lukka website: https://lukka.tech

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Fair Value ---- what and where?

Excerpt from Accounting Standards Codification
Fair Value Measurement—Overall Definition of Fair Value The Transaction 820-10-35-3 A fair value measurement assumes that the asset or liability is exchanged in an orderly ***transaction*** between market participants to sell the asset or transfer the liability at the measurement date under current market conditions. 820-10-35-5 A fair value measurement assumes that the transaction to sell the asset or transfer the liability takes place either: a. In the ***principal market*** for the asset or liability b. In the absence of a principal market, in the ***most advantageous*** market for the asset or liability

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Market Fragmentation

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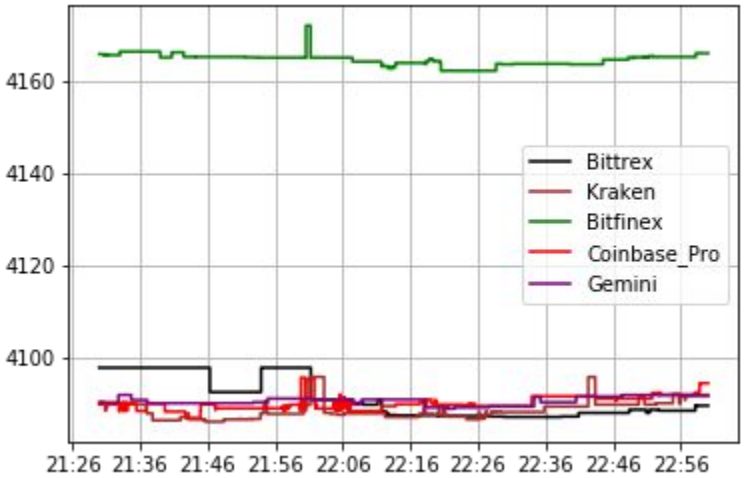
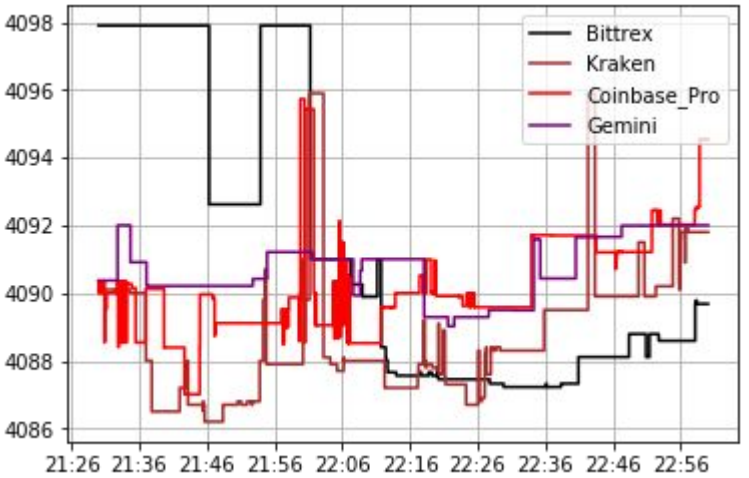
Market Fragmentation – Price Discrepancies

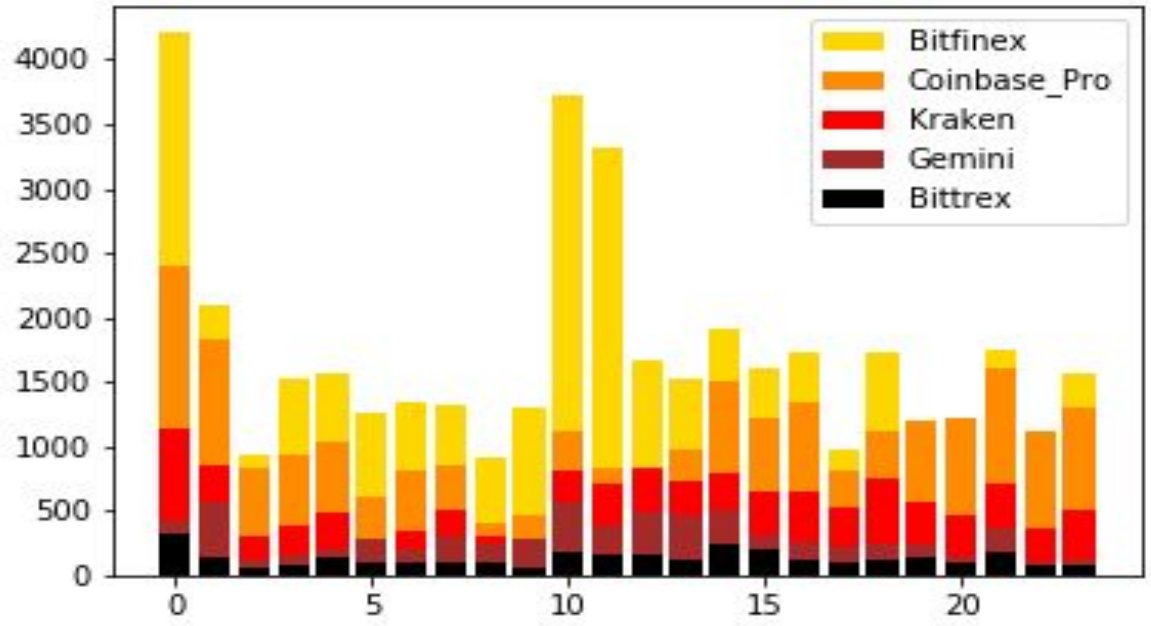




BTC-USD prices on March 31st

*data source Lukka

Market Fragmentation – Substantial Intraday Dynamic



10 am – Bitfinex
10 pm – Coinbase Pro

*data source Lukka

Lukka Pricing

- **Lukka Prime Price** is the price of the *last transaction* on a *dynamically designated principal exchange*

- **Principal exchange** is designated by a publicly known ***algorithm*** abiding by GAAP and IFRS requirements using publicly available data
  - **Algorithm** scores exchanges based on fixed and dynamic factors
  - **Scoring** is responsive to information on three separate time scales

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Base Credit Score (BCS)

- Regulated
- Know Your Client

- Mechanism
  - Implementation
  - Platform
  - Microstructure noise
- Fee structure

- Data quality
  - Latency
  - Transparency

Exchange Monitored by Lukka	Base Credibility Score (BCS)
Exchange 1	70
Exchange 2	100
Exchange 3	55
Exchange 4	0
Exchange 5	40
Exchange 6	50
Exchange 7	100
Exchange 8	60
Exchange 9	50

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Volume Adjusted Credibility Score (VACS)

- Score re-adjusted per currency based on the relative share of reported volume of exchange
- Monthly re-adjustments based on the previous month volume
- Under unusual circumstances (exchange collapse) re-adjustment may be done earlier

Exchange Monitored by Lukka	Base Credibility Score (BCS)	Volume Adjusted Credibility Score (VACS)
Exchange 1	70	20.10
Exchange 2	100	43.95
Exchange 3	55	2.71
Exchange 4	0	0
Exchange 5	40	0
Exchange 6	50	0
Exchange 7	100	11.18
Exchange 8	60	22.05
Exchange 9	50	0

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Decayed Volume Adjusted Credibility Score (DVACS)

At a given point of time the score of each exchange will be decayed proportional to the length of time since the last trade on the exchange

Exchange Monitored by Lukka	Base Credibility Score (BCS)	Volume Adjusted Credibility Score (VACS)	Decayed Volume Adjusted Credibility Score (DVACS) 2019.03.02 23:28:25.382	Decayed Volume Adjusted Credibility Score (DVACS) 2019.03.02 23:28:28.455	Decayed Volume Adjusted Credibility Score (DVACS) 2019.03.08 16:34:15.409
Exchange 1	70	20.10	17.44344	17.43847	17.99402
Exchange 2	100	43.95	12.29275	42.08395	9.97693
Exchange 3	55	2.71	0.7558662	0.7556512	2.742311
Exchange 4	0	0	0	0	0
Exchange 5	40	0	0	0	0
Exchange 6	50	0	0	0	0
Exchange 7	100	11.18	11.0908	11.08771	11.38387
Exchange 8	60	22.05	21.80368	21.79747	4.979898
Exchange 9	50	0	0	0	0
Principal Exchange			Exchange 8	Exchange 2	Exchange 7

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Challenges Moving Forward

Exchanges

- Volume misreporting
- Quality of data
  - Data structure
  - Reference data
  - Monitoring
  - Warehousing
- Mechanism
  - Continuous order book
  - Frequent auctions
- Fees

Measurement

- Snapshots
- Benchmarks
  - Length of window
  - Aggregation method
- Liquidity
- Volatility
- Microstructure noise

Trending

- Stablecoins
- Futures and Derivatives
- Real estate tokens
- Smart contracts

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