UNIVERSITY *of* NICOSIA

MSc in Digital Currency

DFIN-511: Introduction to Digital Currencies

Session 9
Cryptocurrencies and Financial Institutions

Introduction to Digital Currencies

UNIVERSITY of NICOSIA

Session Objectives

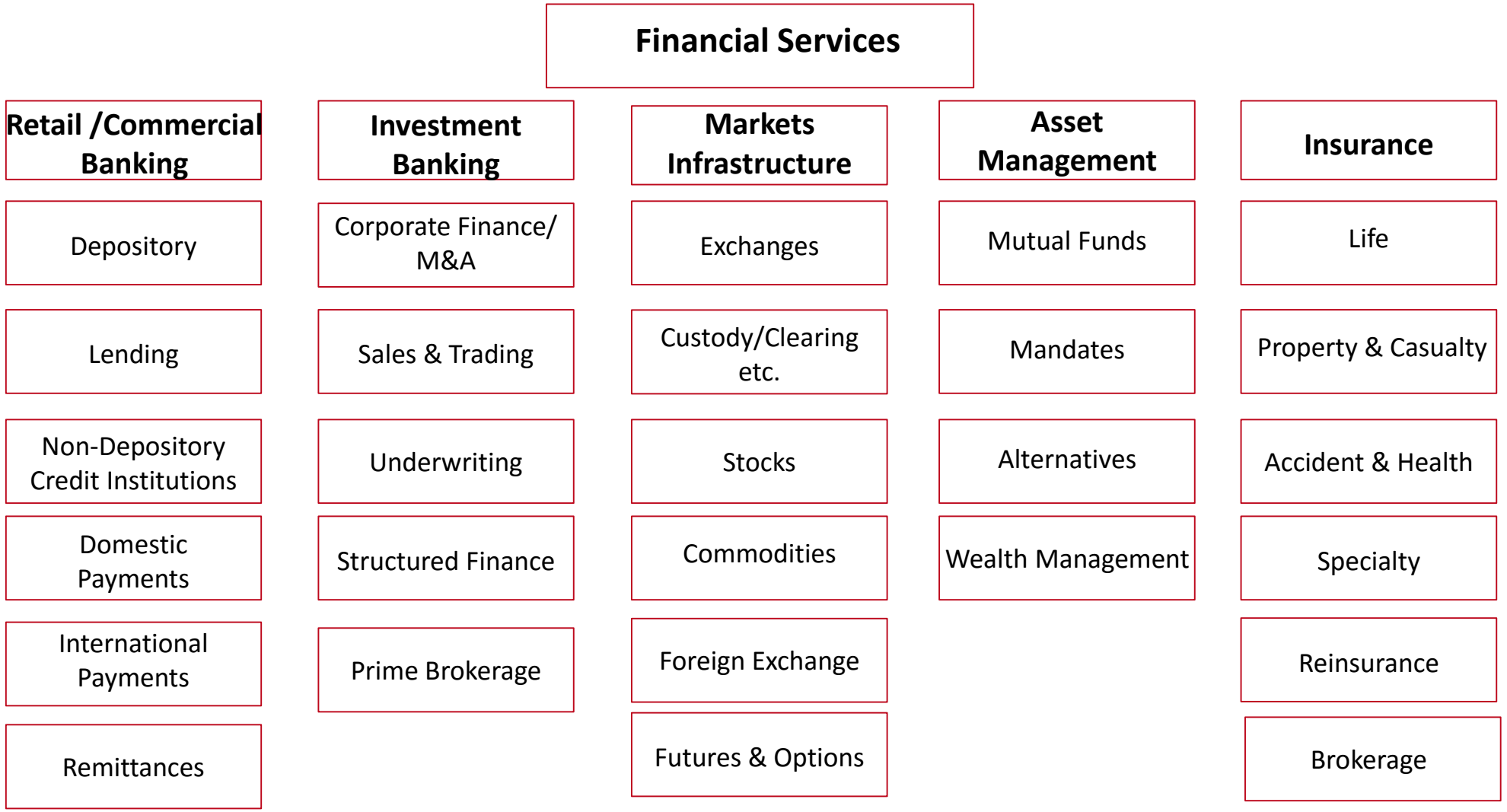
- Briefly summarize existing financial services as an introduction
- Explore cryptocurrency financial services as they are at the moment, i.e. exchange centers, merchants and wallets for cryptocurrencies
- Understand the opportunities behind payment as a process with the use of cryptocurrencies

Agenda

1. Existing Financial Services: Some Brief Notes
2. Early areas of cryptocurrency-based financial services
   - Exchanges
   - Wallets
   - Merchant Processing
   - Asset Management
3. Payment Opportunities?
4. The lower levels of Financial Systems and the future
5. Conclusions
6. Further Reading

Existing Financial Services: Some Brief Notes

What is Financial Services?



Financial Services are well developed…

Financial services: Strengths

- Hundreds of years of financial systems development has lead to a very developed and sophisticated field, serving many different needs
- Most consumers in developed countries have a friendly consumer environment:
  - Generally, taxpayer protection for deposits <$100K or so
  - Generally, consumer protection for misuse or fraudulent use of payment systems
  - Makes use of financial system low-risk for an individual user
- Regulation and taxation is quite clear
- Significant trust in financial institutions
- Costs well hidden from consumer and mutualized. Fraud detection and customer reward costs (aka airline points) are embedded in merchant processing fees and not directly seen by consumer (instead they enter the cost of products)

..but have significant gaps

Financial Services: Areas for Improvement

- Large number of people still unbanked, even though the proportion of people with bank accounts worldwide grew from 62% to 69% between 2014 and 2017 according to World Bank Data.
- Unbanked: 1.7 billion people worldwide
- Bangladesh, China, India, Indonesia, Mexico, Nigeria, and Pakistan are home to nearly half of the world's unbanked
- Mixed performance of payment systems. Certain countries have near real-time payment systems (aka Faster Payments in UK) but the United States lags substantially (ACH payments take 1-3 days)
- Major security and fraud costs: Credit card security model not well suited for the electronic age (equivalent of "private key" on card in basic model). Tens of billions of losses annually mutualized and ultimately paid by the consumer
- Mixed performance on remittances. Some country pairs are very competitive and low cost. Others cost 10-12% of transaction. No viable method for small international remittances
- Cyprus "bail-in" in 2013 was the first bail-in of national systemic banks. A one-time occurrence or an ongoing risk?
- The financial sector in US, Europe since 2008 has required massive taxpayer support to avoid collapse

Areas for Improvement

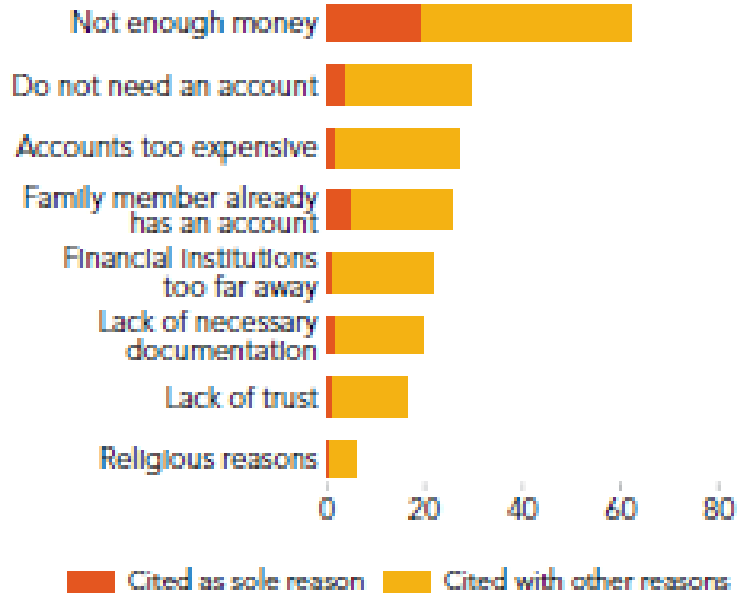
Globally, 1.7 billion adults lack an account
Adults without an account, 2017

Source: Global Findex database.
Note: Data are not displayed for economies where the share of adults without an account is 5 percent or less.

FIGURE 2.11

Lack of enough money is the most commonly cited barrier to account ownership

Adults without a financial institution account reporting barrier as a reason for not having one (%), 2017



Source: Global Findex database.
Note: Respondents could choose more than one reason.

Early areas of cryptocurrency financial services

Financial Services: Representative Figures

- Financial Services is the most profitable industry in the United States (US Department of Commerce):
  - In 2017, finance and insurance represented 7.5 percent (or $1.45 trillion) of U.S. gross domestic product. This makes the U.S finance market the largest and most liquid in the world.
  - https://www.selectusa.gov/financial-services-industry-united-states
  - 6.3 million people were employed in the financial services and insurance sectors in 2017
  - It generates between 30-40% of all US industry profits. This likely reflects some level of barriers to entry in the system
  - Total Global Assets Under Management: $63T rising to $102T by 2020 (PwC 2020 Asset Management Report)
  - Currency Trading: $5.3T per day, $220 billion per hour (Bank for International Settlements)

This is why some investors are excited about cryptocurrencies – even a small penetration of financial services is a huge opportunity

Cryptocurrency financial services

Crypto Industry: Representative Figures

- Significant industry revenue in mining, exchanges and nowadays majority derived from Initial Coin Offerings
- Total value of all cryptocurrencies: ~ this period in the range of $120B-$150B
- Total Daily Trading Volume in cryptocurrencies usually is around $30B per day
- Source: www.coinmarketcap.com

Tiny in traditional terms, but still rather remarkable given that Bitcoin was just a white paper about 9 years ago. These figures vary substantially over periods

This is due to the open nature of cryptocurrency – in traditional financial services access to "payment rails" is strictly controlled

Cryptocurrency financial services

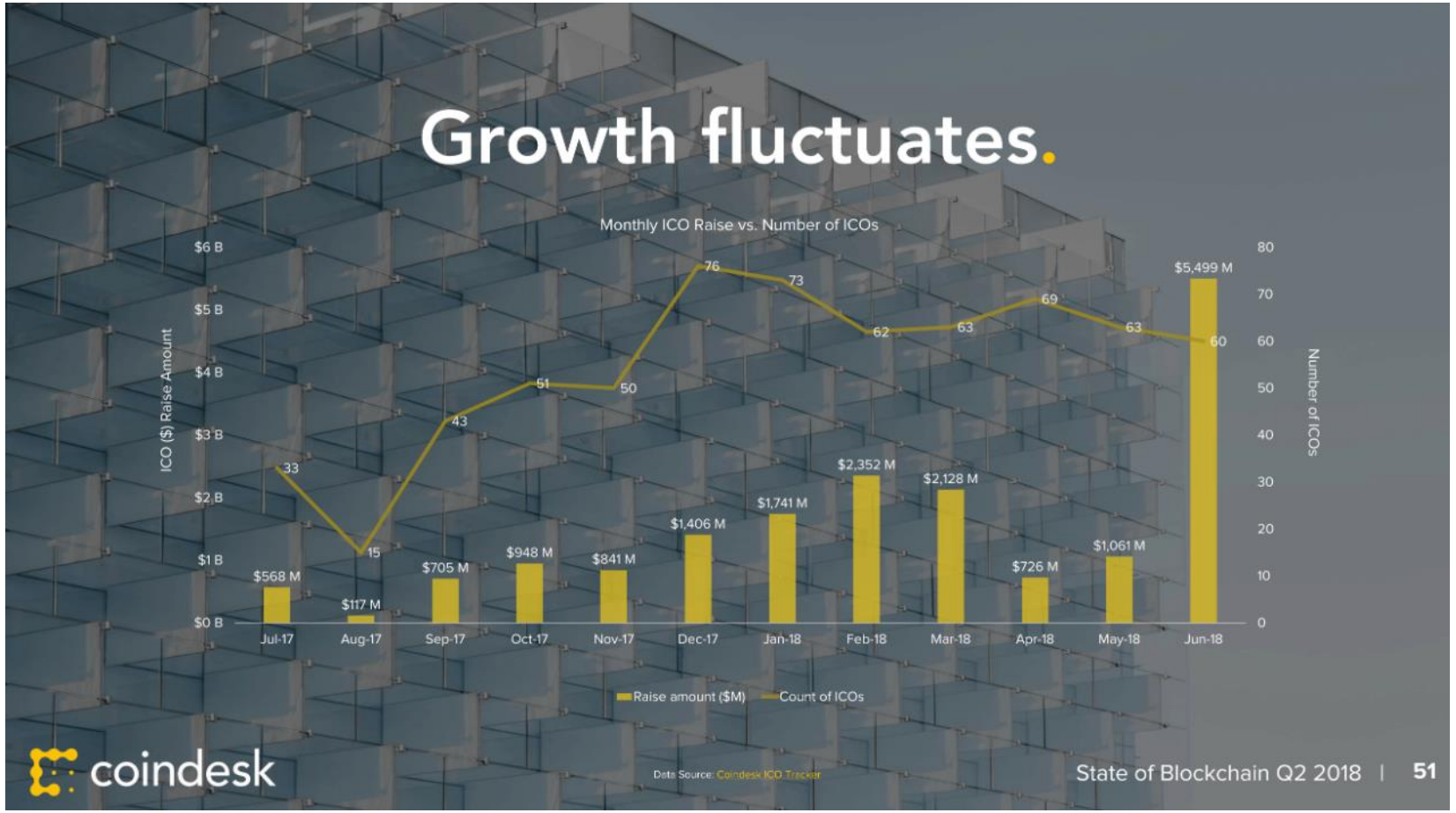
First wave of cryptocurrency financial services startups focused on four areas:

Cryptocurrency Institutions		Existing Equivalent
Cryptocurrency Exchanges	→	Global FX Market
Wallets	→	Depository Accounts (storage and payments functions)
		Money Transmitters
Merchant Processing Services	→	Merchant Processing Services
Cryptocurrency Funds	→	Investment Funds

Investments - State of Blockchain Q2 2018, CoinDesk

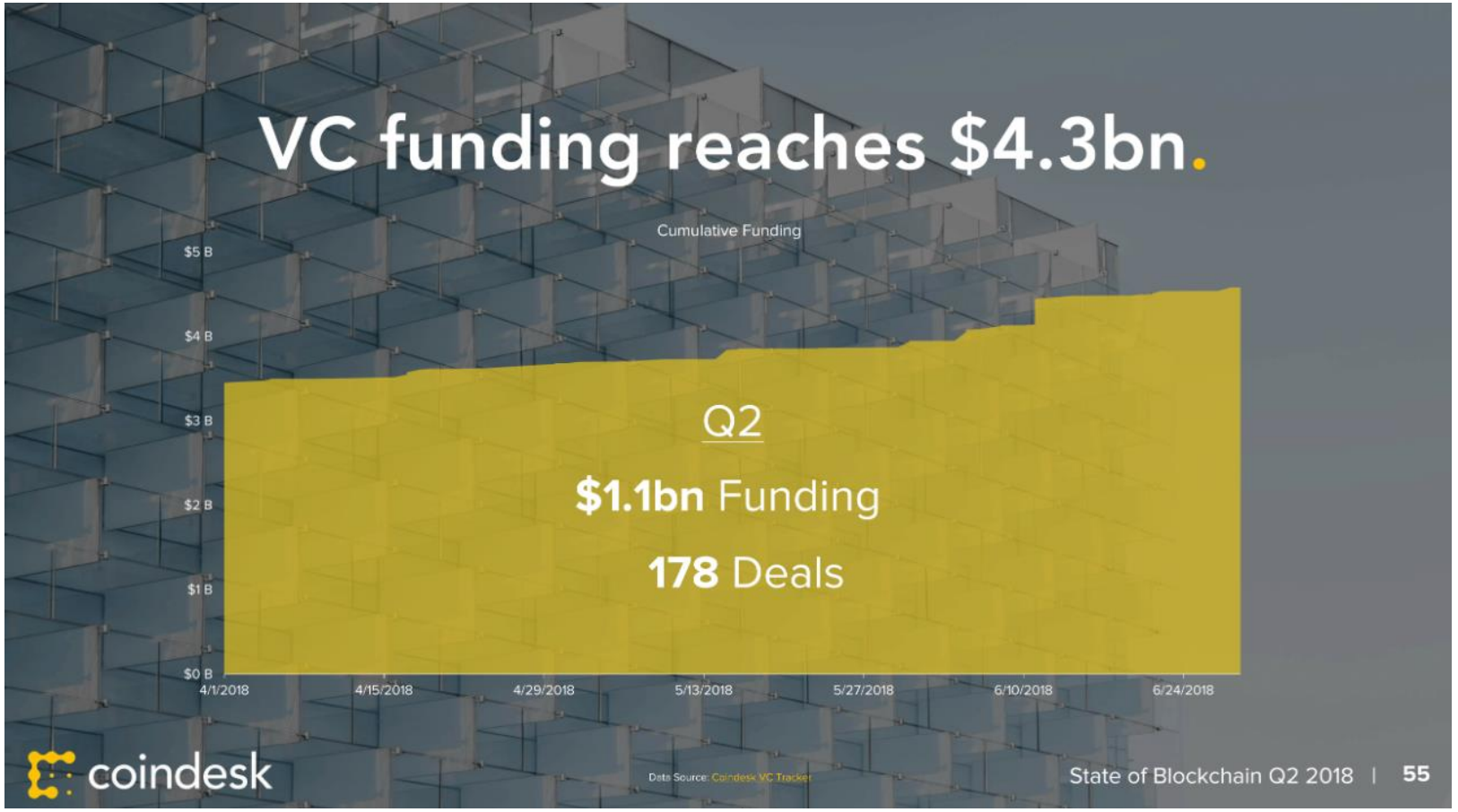
Source: https://www.coindesk.com/research/state-of-blockchain-q2-2018/?slide=50

Investments - State of Blockchain Q2 2018, CoinDesk



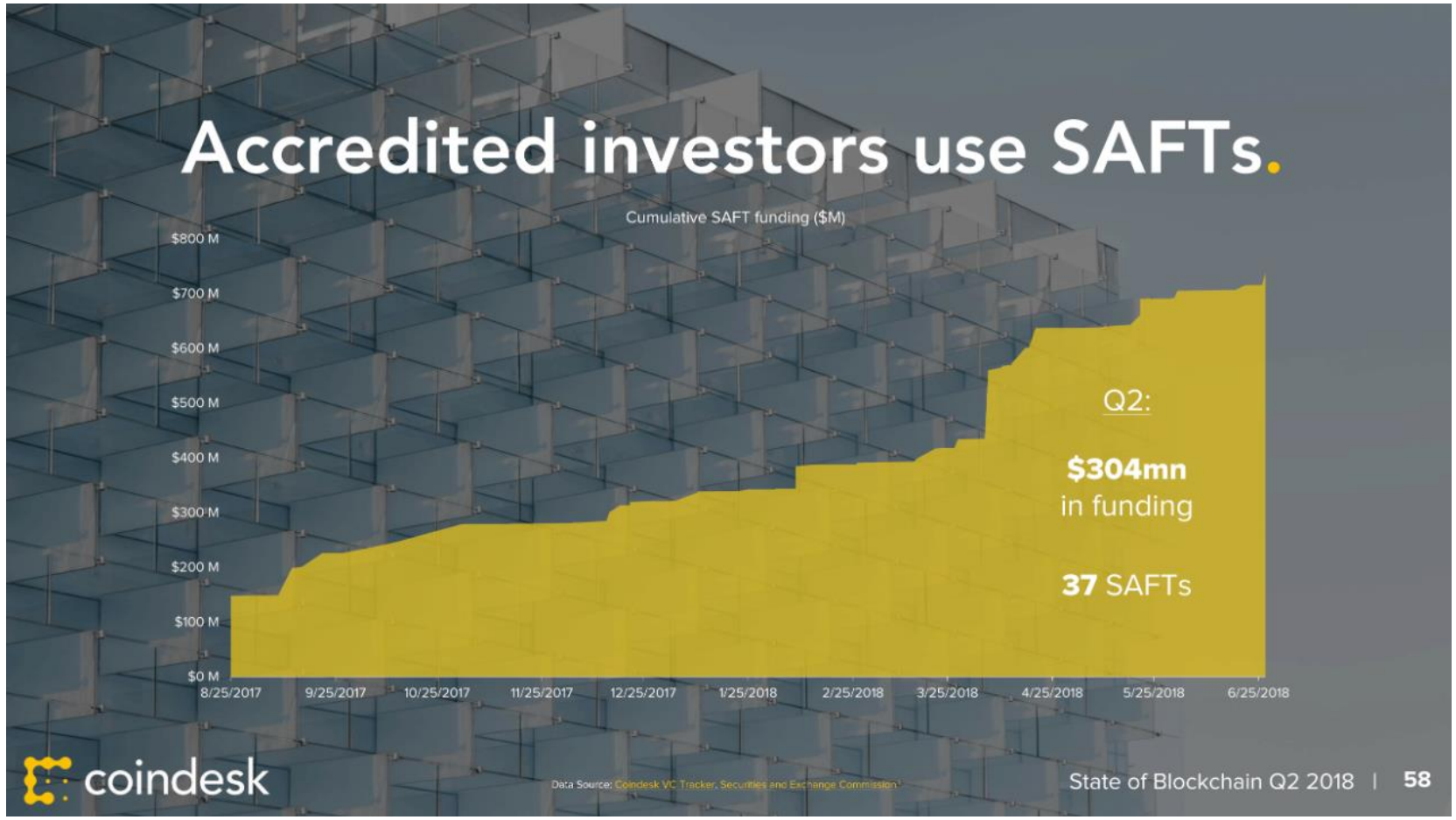
Source: https://www.coindesk.com/research/state-of-blockchain-q2-2018?slide=51

Investments - State of Blockchain Q2 2018, CoinDesk



Source: https://www.coindesk.com/research/state-of-blockchain-q2-2018?slide=55

Investments - State of Blockchain Q2 2018, CoinDesk



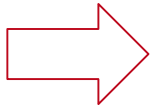
Source: https://www.coindesk.com/research/state-of-blockchain-q2-2018?slide=58

Foundational services in Bitcoin

Wallets

Exchanges

Merchant Tools
(for processing payments)



- These three technologies are the fundamental building blocks of cryptocurrency financial services.
- Once they exist in a mature format, they will be the backbone of the payments system and will allow higher order applications. All more advanced financial products will benefit from greater underlying liquidity, superior security and better user experiences.
- As such and in aggregate, they will serve as the payments infrastructure for cryptocurrency, taking on the role of the following areas in the traditional sector:

Cash | Checks | Debit Cards | Payment/Clearing House Networks | Wire Transfers | International remittances Merchant Processors | Foreign Exchange

Foundational metrics in Cryptocurrencies

Wallets

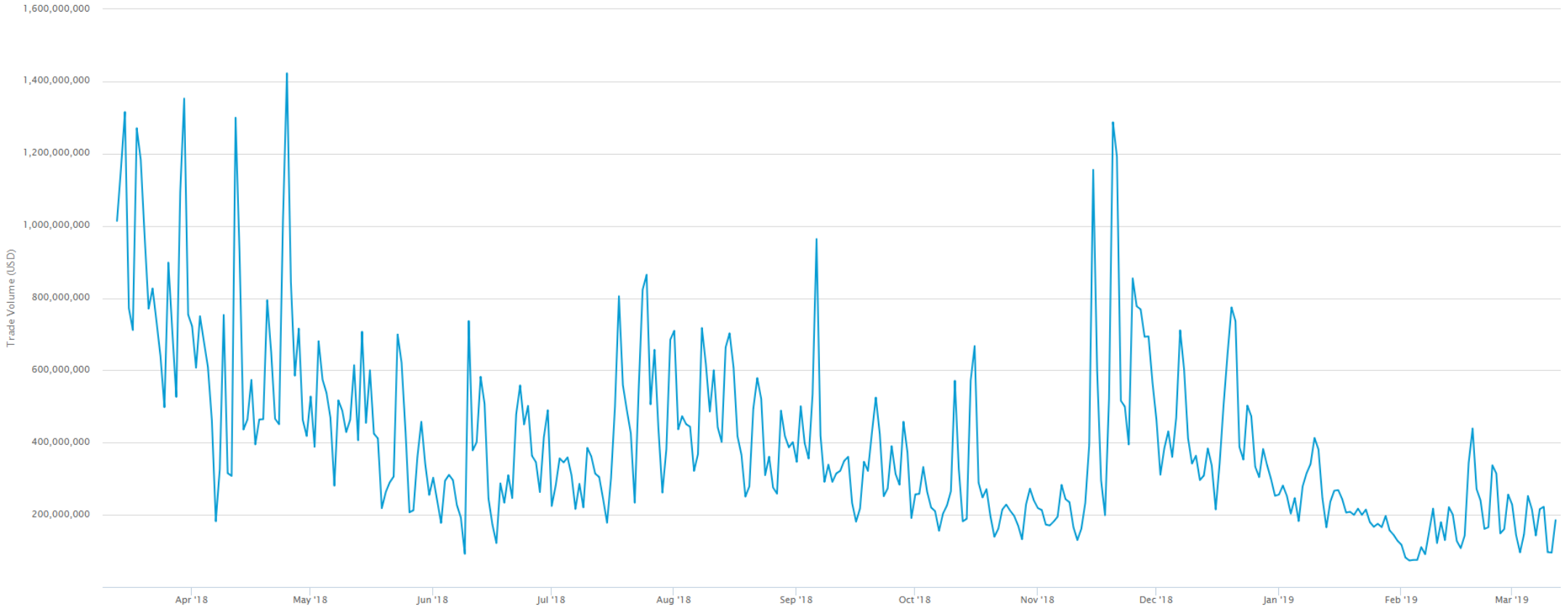
Exchanges

Merchant Tools
(for processing payments)

	March 13, 2019
BITCOIN	
- Market Capitalization	$68,702,162,406
- Price	$3907.96
- Supply	17,585,837 BTC
TRANSACTION METRICS	
- Confirmed BTC Transactions the past 24 hours	285,615
- Traded Volume for the day	$9,467,121,383
- Average Transaction Fee	$0.425
- Average Number of Transactions Per Block for the day	1998
NETWORK GROWTH METRICS	
- Blockchain Size (GB)	207,516
- Mempool Size (Bytes)	734,170
- Unique Address Count for the day	488,929
- Blockchain.info Wallet Users	34,132,002
MINING METRICS	
- Network Hash Rate (TH/sec)	43,141,337
- Difficulty	6,068,891,541,676
- Average Mempool Transaction Count	2,058
- Average Mempool Size Growth (Bytes/sec)	1,181

Foundational services in Cryptocurrencies

- EXCHANGES - The total USD value of trading volume on major bitcoin exchanges.



Source: https://blockchain.info/charts/trade-volume?timespan=1year

Merchants – BitPay Use Case

- In June 2018, BitPay's merchants have received approximately $70,000,000 in bitcoin payments with a 0.27% error rate. BitPay merchants can also receive settlement in BCH while the organization claims a 250% increase on their business to business payments' volume in 2018.
- BitPay has introduced stable coin settlements in GUSD, USDC, and PAX in October 2018 and gift card purchases via the BitPay Wallet.
- When BitPay merchants announce that they are accepting bitcoin payments, they often see an increase in new customers from the bitcoin world. BitPay is charging 1% compared to 2-3% fees charged for credit card transactions.

- ***BitPay Merchants***

Cryptocurrency Exchanges

Representative Firms

Overview

- Cryptocurrency exchanges allow users to buy or sell cryptocurrencies in exchange for one or more sovereign currencies. They are essentially the gateways in/out of the cryptocurrency world from the existing financial system.
- To date, they have had a checkered history, as many of the early exchanges, have suffered attacks and bankruptcy, including the well known case of Mt. Gox, resulting in several millions in lost customer funds.
- Many of the large remittances markets are just beginning to develop exchange services (India, Philippines, Indonesia, etc. More on this on session 12). In most other cases, users often use LocalBitcoins, another ad hoc exchange service that connects local demand to local supply.

Cryptocurrency Exchanges

Over 200 cryptocurrency exchanges exist, but there are some certain things to look out before joining one.

- Fees: Deposit, transaction and withdraw fees vary from exchange to exchange. Some of them favor mainly larger transactions. All these details are available in each exchange's website
- Cryptocurrencies supported: You may want to choose an exchange which allows you to buy/sell a variety of cryptocurrencies other than Bitcoin (e.g. Ether, Monero, Zerocoin, Bitcoin Cash etc.)
- Reputation: User reviews from people within Bitcoin communities is the best way to find out all you need to know as this group of people is very active and willing to help. Reddit is considered a good source
- Verification Requirements: ID and address verification is required by most exchanges in order to deposit and withdraw. Experienced users tend to stay away from exchanges which allow them to remain anonymous, as they are the most vulnerable to money laundering and scams
- Payment Methods: Choose an exchange which allows you to deposit/withdraw by a variety of ways (e.g. credit card, debit card, wire transfer, cryptos, PayPal, AstroPay etc.)
- Exchange Rate: The exchange rate varies among different exchanges. It is recommended that a user has access to 2-3 exchanges for his/her convenience
- Geographical Restrictions: Make sure you join an exchange which allows you to gain full access and use all the functions available

Cryptocurrency Exchanges: Issues/Areas for Development

- **Liquidity**: There is low liquidity in cryptocurrency markets relative to the traditional foreign exchange markets. This means it is hard to transact institutionally significant amounts of bitcoins. It also makes the markets more subject to manipulation.

- **Security**: Exchanges have been plagued with security breaches / loss of customer funds, a notable of them being Bitfinex and recently Cryptopia. Future developments will either model themselves on existing custodial models in traditional exchanges, multi signature private key management and/or cryptographic proof of funds (like Bisq is doing).

- **Futures**: There is an increased interest in futures market in cryptocurrency, and some exchanges offer pairs in this direction. Futures provide the ability to lock in currency rates for future transactions and play an important role in reducing volatility in any asset class.
  - https://www.bitmex.com/
  - https://www.cmegroup.com/trading/bitcoin-futures.html

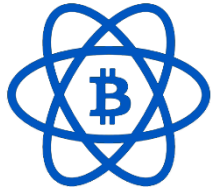
Cryptocurrency Exchanges: Issues/Areas for Development

- **More currency pairs**: For cryptocurrencies, there are very few currency pairs that are even marginally liquid – each currency area will need at least 1 liquid exchange for cryptocurrency to reach its potential.

- **Regulatory Environment**: There is still significant lack of clarity (globally and regionally) on exactly what requirements cryptocurrency exchanges need to comply with. New York State has produced a "Bit License" which we will discuss in the next session.
  - Legality of Bitcoin by country/region: https://en.wikipedia.org/wiki/Legality_of_bitcoin_by_country_or_territory

Wallets

Representative Firms



Overview

- Wallets (discussed on an earlier session) provide users with a system to hold their cryptocurrency and to make / receive payments with their wallet. These wallets provide features or ease of access that the standard Bitcoin client wallet does not. Wallets are divided into three types, broadly speaking (revision from previous session):
  - **User Hosted**: These are solutions (like Electrum and Mycelium) where the users exclusively hold the private keys (with or without a full copy of the blockchain). That means that the wallet developer cannot access or lose the users' coins or provide information to authorities about account activity. On the other hand, if the user loses his/her password or their wallet is otherwise compromised, there is no recourse and the coins are lost.
  - **Web Hosted**: Services like Blockchain.info and GreenAddress provide encrypted wallet hosting on the web. The user takes advantage of their infrastructure to host locally encrypted private keys which the service cannot access. The user still runs a risk of a compromised computer or forgotten password.
  - **Fully Hosted**: These are solutions where the wallet provider holds the private key to a wallet. That means they can recover from password losses, but also means the user must trust the wallet provider not to lose the coins or share data with authorities. It is not clear in this situation if a user owns coins or just a claim against the company, but as a rule of thumb, coins you don't control the private keys of, are not yours! Multi-signature wallets (like Bitpay's Copay) are an attempt to mitigate the former problem by creating multiple points of failure.

Wallets: Issues/Areas for Development

- **Exchange w/Sovereign Currencies**: Some online wallets offer a linkage back and forth to sovereign currencies without being full-blown exchanges themselves. The user experience of the current implementations of this concept is still not the best.

- **Security/Insurance**: Consumers in traditional banking system have earned, over time, significant consumer protections, from FDIC insurance to the ability to not pay for fraudulent charges on credit cards. Certain wallet providers have started offering private insurance to start to replicate this protection, at least partially.

- **AML/KYC**: Many exchange/wallet services are implementing homegrown AML/KYC approaches. In time, one should expect practices in this regard to standardize.

- **Merchant Acceptance**: To date, while merchant acceptance is increasing in percentage terms, it is still small in absolute numbers. The two largest payment processors (Coinbase and Bitpay) are probably serving under 500,000 merchants, compared to approximately 30M merchants that accept Visa.

- **Tax Reporting**: Wallets should perhaps support the latest tax reporting requirements. Payment processors like Bitpay offer a level of accounting system integration to businesses accepting Bitcoin.

Merchant Processors

Representative Firms

Overview

- Merchant processors provide tools to merchants to accept payments in cryptocurrencies.
- They are almost directly analogous to the current merchant processors (First Pay, WorldPay, Elavon, Authorize.net, Square, etc) for current payment networks (Visa, Mastercard, American Express, Discover).
- These tools typically include integration with the merchant's website and shopping cart and then the option to convert the digital currency back to sovereign currency (with no exchange rate risk to the merchant).
- Current market prices are about 1% in processing fees (as opposed to 2-3% for credit card processing) or a monthly subscription model. These lower costs plus the publicity boost that accepting digital currency may entail have been driving merchant adoption.

Merchant Processors: Likely Initial Areas For Adoption

- **Online Products**: The major value proposition of digital currency merchant processing to date is lower costs. Online firms, particularly in categories like electronics, have notoriously low margins (< 5%). In that context, saving even 1% in merchant processing fees would have a significant impact on profitability.
  - A well known example to date has been Overstock.com. It was estimated that in 2014 (the first year it accepted Bitcoin), that $20-$30M of its $1B in annual sales would be in Bitcoin. Projections were missed by a wide margin, and Overstock reported about $3M in Bitcoin sales in 2014.
  - In 2018, Jonathan Johnson, a member of the board of directors of Overstock, claims that Overstock is gaining up to $120,000 per week in cryptocurrency revenue.
  - The fact that online products need to be shipped also means that transaction confirmation times are sometimes not relevant.
- **Sensitive Products**: Sensitive areas like medical spending (HIV tests, pregnancy tests), pornography, or political speech might be areas where consumers feel more comfortable transacting in cryptocurrency. Consumers might not want these transactions recorded along with the rest of their payment records and banking history.

Merchant Processors: Likely Initial Areas For Adoption

- **High-Risk Vendors**: Consumers concerned about giving access to their credit card/credit line to "risky" vendors can use cryptocurrency that uses a "push" model rather than a "pull" model. In other words, the customers exposure is limited to the amount the customer proactively sends.

- **International Customers**: Many websites turn away customers from higher risk locations due to fear of chargebacks due to fraudulent card use. Given that cryptocurrency is irreversible, merchants can accept customers from any location without fear of fraud chargebacks.

- **Open Bazaar** : Should OB gain traction and adoption, we can expect several merchants will open stores on it.

Merchant Processors: Likely Initial Areas For Adoption

- Sberbank, a state-owned Russian banking and financial services company has indicated that it sees potential in Bitcoin's blockchain technology, with regards to replacing the existing funds transfer technology e.g. between banks. It has also launched a blockchain lab in January 2018 and conducted Russia's first commercial bond deal on the blockchain in May 2018

- They are big believers in the blockchain concept as they noted that, "The current system where 10,000 banks are used to transfer funds can be replaced by the blockchain" although chairman Herman Gref believes that the implementation horizon of the technology could take "8 to 10 years"

- In a similar light, the Estonian Bank LHV has also made further links in the digital currency space, by partnering with Coinfloor, a UK-based Bitcoin Exchange, to handle customers' deposits. LHV have said that, *"For fiat deposits, Coinfloor undertakes a number of measures, including proper due diligence (KYC) on each customer. The company goes to great lengths to make sure all client funds are kept with European banks that understand Bitcoin and Coinfloor's business model"*

- *Several more banks have jumped in either their own ventures or as part of R3, Hyperledger, Ethereum Enterprise Alliance, or a multitude of other initiatives which have sprung up*

Asset Managers

Representative Firms

BITCOIN INVESTMENT TRUST™

Fidelity INVESTMENTS

If you are not familiar, check what ETFs are

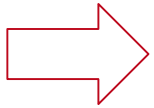
Overview

The cryptocurrency investment trusts or ETFs are vehicles to buy cryptocurrency. Crypto ETFs can be physical-backed or futures-backed. Given that anyone can invest in cryptocurrency by buying it directly, these vehicles are more geared towards:

- The convenience of customers who might not want to have to learn how to manage cryptocurrency directly and the ease of distribution into traditional investment channels (brokerages, IRA managers and so on)
- Grayscale hosts both Bitcoin Investment Trust and Ethereum Classic Investment Trust. Speculations it owns 1% of the Bitcoin supply
- Other cryptocurrency "hedge funds" claim that they can earn returns by trading cryptocurrencies (buying and selling them). This would be a direct equivalent to funds that trade in foreign currency and would be something only open to institutional investors.
- This area is only now starting to develop because institutional investors will require larger, more regulated, more secure exchanges in order to be able to trade on them. Fidelity, the 5th largest asset manager in the world, has announced the launch of an institutional platform for Bitcoin and Ethereum. On Mar. 7th, the division announced that their services are live with some of their clients.
- These asset managers are the most straightforward cryptocurrency financial services firms. They are not trying to displace or disrupt any part of the existing system and will fit in naturally among the wide range of other existing investment options
- The Winklevoss ETF was rejected for the second time in July 2018, citing among other things, lack of surveillance sharing agreements with significant markets and investor protection
- London-based ETF to be launched in March 2019

More Financial services powered by blockchain technology

- Forex
- Equities
- Lending
- Stocks
- Contracts
- Futures / Options
- Insurance



- Nasdaq's OMX Group Inc has been testing a new use of Bitcoin's blockchain technology, to transform the trading of shares in private companies. According to Nasdaq Chief Executive Robert Greifeld, "Utilizing the blockchain is a natural digital evolution for managing physical securities".
- Nasdaq's Private Market platform has more than 75 private companies signed up, and it aims to revolutionize the systems that have facilitated the trading of financial assets for decades.
- Nasdaq futures to be launched first half of 2019
- CME Group launched Bitcoin futures in late 2017
- Allianz has recently unveiled a blockchain prototype for self-insurance products

Indonesia regulatory landscape on futures:

- https://www.coindesk.com/indonesia-passes-rules-for-trading-of-cryptocurrency-futures

Payment Opportunities

Payments: The Opportunity?

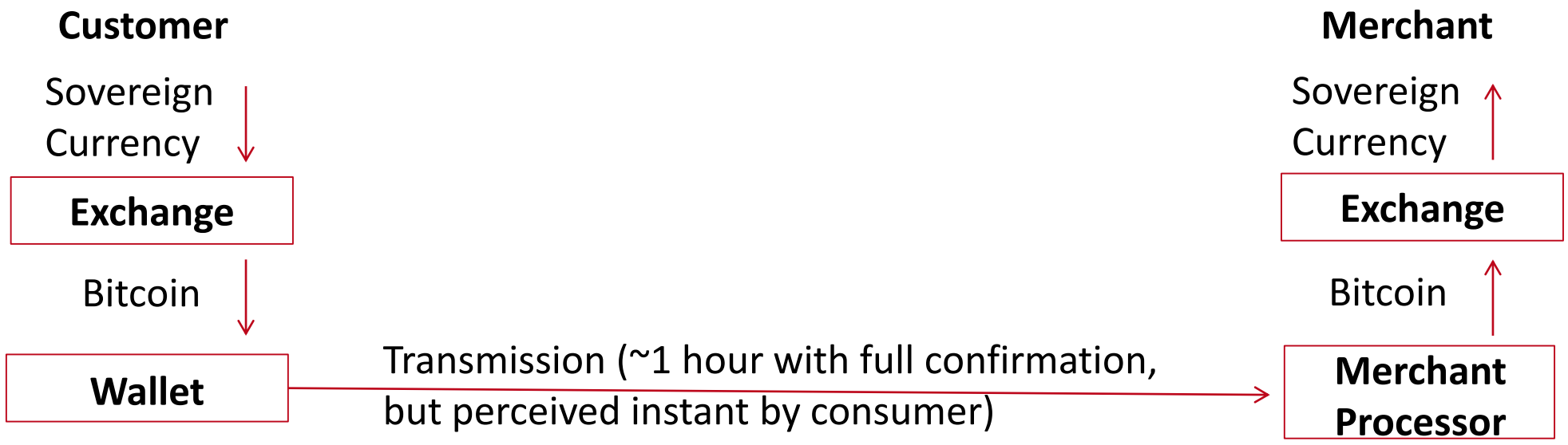
- Estimates of the cost of processing global payments are in the range of $500 billion per year.
- The market capitalization of firms or operating divisions in payments is probably close to $1T.
- There is a gigantic opportunity for cryptocurrency based payment systems. However, for them to succeed at scale, they need to solve several distinct items(that would work together in a virtuous cycle if solved):
  - Reduce Bitcoin/cryptocurrency volatility.
  - Build institutional grade exchanges, wallets and payments processors.
  - Provide clear value to consumers, a task made more difficult given that the key costs of the current system are cleverly mutualized and hidden from consumers.
  - Build trust with consumers and merchants.
  - Provide user-friendly services

Payments: The Opportunity?

- It is important to also keep in mind that consumer behavior changes very slowly even in the developed world and basic non-cash transactions (credit cards, cheques, credit transfers, direct debit) have barely penetrated large parts of the world. That might change though with increasing access to the Internet and more options to connect the global market faster.
  - In 2010, the number of cashless transactions of all types per year, per inhabitant was only 5% in China and 6% in India (BIS).
  - In 2012, nearly twenty years after launch of consumer internet, only 5.7% of retail transactions in the US were transacted online (US Department of Commerce). This figure has now increased to almost 10%.
  - Even a superb success story for cryptocurrencies would only see them gaining a very small percentage of payments transactions over the next few years. Taking a meaningful share of global transactions will be a shift with a 10 to 20 year timeframe

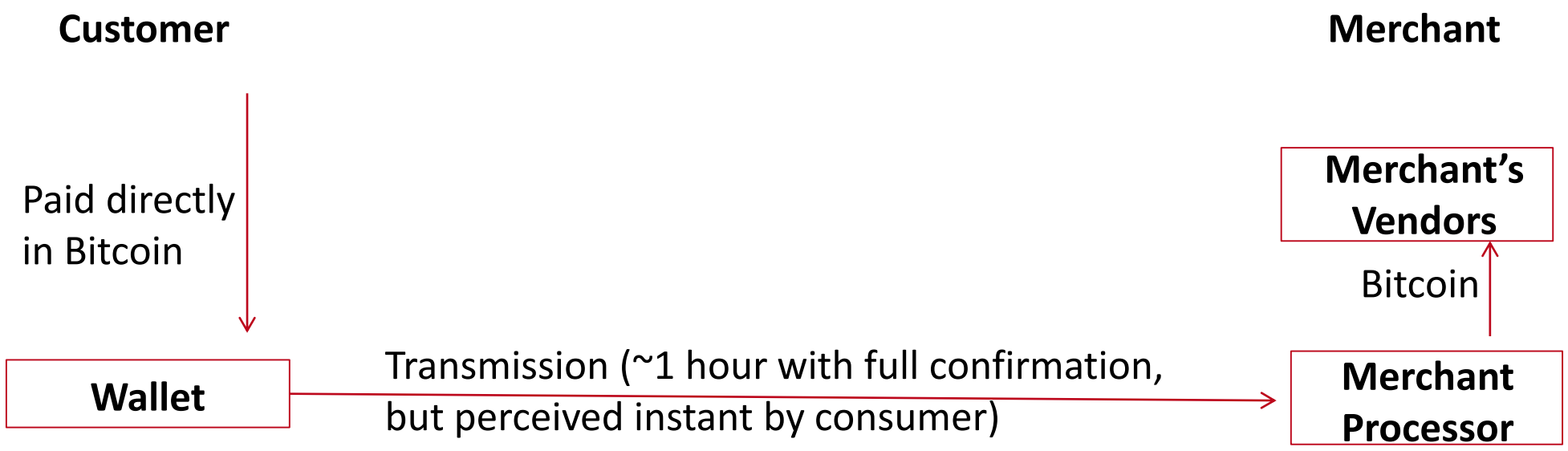
Payments – Consumer Transactions : The Medium Term Outcome?

- Today, some, if not all, of the cost savings of cryptocurrency merchant processing are being taken up by the spreads/fees to translate back and forth from sovereign currency. Merchants are receiving most of the savings and might consider rewarding the consumer directly (via lower prices, loyalty points, rewards, etc.) to encourage use.



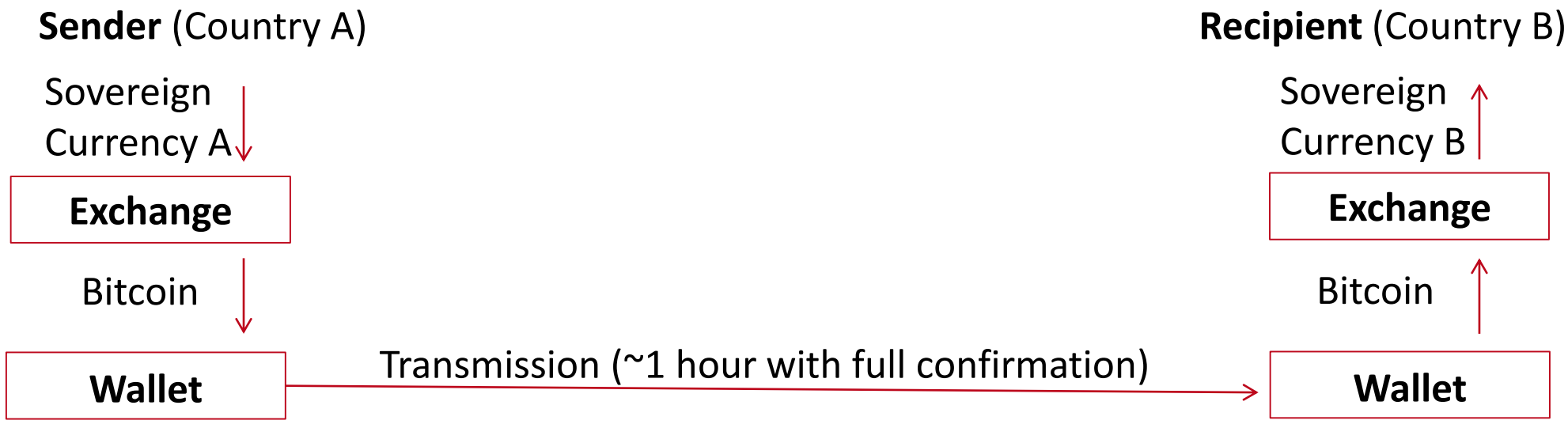
Payments – Consumer Transactions: The Long-Term Outcome?

- In a future world where there would be broad merchant acceptance of, say Bitcoin, and sufficient price stability for people to be comfortable holding Bitcoins, payments could then operate in a closed-loop within Bitcoin. This would represent the desired outcome for Bitcoin enthusiasts.



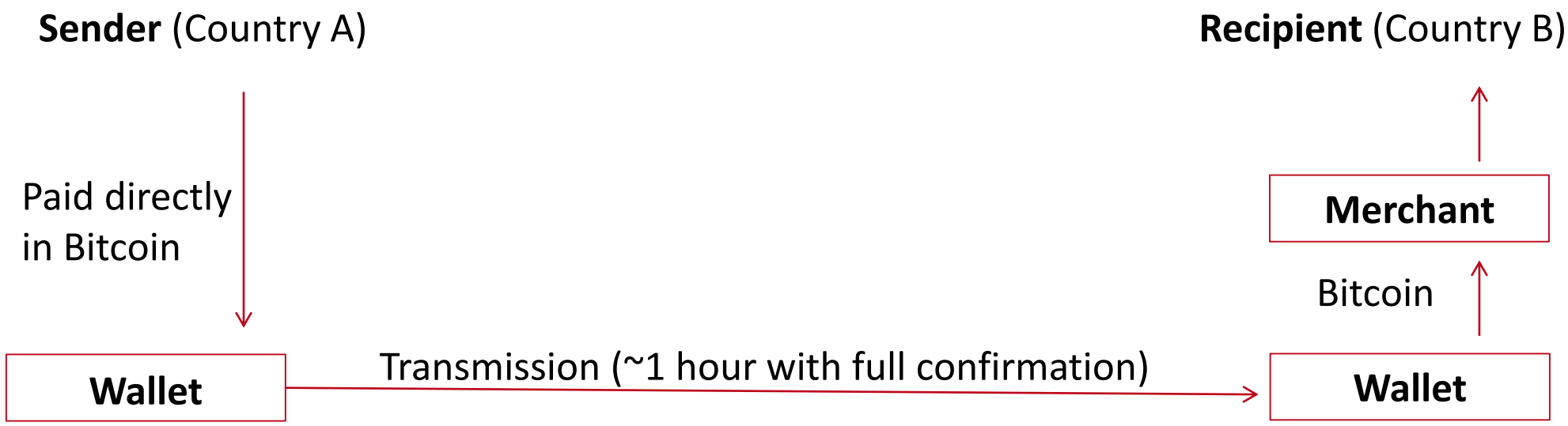
Payments - Remittances: The Medium Term Outcome?

- With a fully developed global network of exchanges and easy-to-use wallets, remittances could be done without dedicated remittance providers. Hurdles to overcome will include: (1) Exchange spreads on both sides (the "fees"), (2) other KYC/AML costs, and (3) technological savvy of sender/recipient.



Payments - Remittances: The Long Term Outcome?

- In a future world where there would be a broad merchant acceptance of, say Bitcoin, and sufficient price stability for people to be comfortable holding bitcoins, the remittances could happen without exchanges at all. This would represent the desired outcome for Bitcoin enthusiasts.



The lower levels of Financial Systems and the future

But wait… there's (far) more …

- We've only scratched the surface of financial systems and the functions they perform in the global economy. Bitcoin and blockchain technology, has perhaps, the profound potential to transform several of the functions that take place in the lower levels of our financial systems' operation. These are the, so called, "plumbing" of how financial systems interconnect, and how they operate.

  - These involve how **Settlement** and **Clearing** takes place (How banks and other organizations convey financial information and transfer funds between each other and account holders)
  - **Cards and Payment systems**, that operate in quite a different manner than we see in Bitcoin.
  - **Asset Issuance, Trading, Clearing and Settlement** through which all shares, bonds and stocks are traded
  - **Insurance, Financial Derivatives and Prediction markets** which act to stabilize risk in financial activities
  - **Auditing, Accounting and Financial Controls**, which act as the planning and security mechanisms of financial activity worldwide

Settlement and Clearing

Unless the two accounts are under the same bank, the settlement is inefficient and credit/counterparty risk is introduced even when the accounts are under two banks with a correspondent relationship i.e. maintain accounts with each other

Three basic Systems :

- Gross Settlement Systems(GSS) and Real-time Gross Settlement Systems (RTGS)
  - Each transaction is processed as it happens (not bundled or netted or batched with others) with reduced intraday credit risk. However it increases liquidity needs (you need to fund each transaction at a time) and, subsequently, cost of liquidity (more reserves or interest charges)
- Net Settlement Systems
  - Transactions are netted out at the end of the day, so only the 'net' amount is settled but with an increase in intra-day credit risk. Reduces liquidity needs as only the net amount has to be available from a liquidity perspective
- Hybrid Systems
  - Systems that are effectively near real-time systems but look for opportunities to reduce liquidity needs, such as netting of queued orders, or the prioritization of orders, or delaying orders above certain liquidity limits.

There's far more similarities to how Bitcoin already operates in this regard, but also stark differences. We examine these in depth in the DFIN 513 course of the Msc, Open Financial Systems.

Payment Systems

Payment systems like VISA, Mastercard, Paypal (and cash) have been the backbone of consumer and merchant payments for decades. They use **"pull"** systems to draw funds from an account and channel these instructions through a wide and complex network, in which costs are largely hidden from end consumers, and costs and risks are mutualized through to them.

- While an accepted and normal part of everyday life, it is rather staggering if one thinks about it too carefully. A large array of parties may potentially have access to this information including the merchant, the acquirer, the payment processor, the gateway, the network and all of its employees, contractors and vendors.

- **Push** payments like Bitcoin and MPesa, theoretically are more secure in that:
  - only two parties have access to the payment information, the payment provider and the consumer device
  - only the transaction at hand is at risk (not the whole account)

Push payments open up a new set of challenges in that they make consumer end-points (browsers, phones, etc) the most important point to protect, and they make the user ultimately responsible. This in itself presents complexity but significant opportunity as well, as we examine in depth, in the DFIN 513 course of the Msc, Open Financial Systems.

Assets

The basic function of how Real Assets and Financial Assets are traded is split into three functions and this is inevitable, given the much faster cycles required by trading (now down to the milliseconds) vs. settlement (still measured in multiple days).

- Trading: Matching bid/ask orders among traders
- Clearing: Everything that has to be done between trade and settlement
  - Order reconciliation
  - Risk/credit management
  - Handling failure states
- Settlement: Actual transfer of the securities, cash to execute the trading promise

While development of platforms to provide for the decentralized issuance, trading and settlement of assets on the blockchain, has progressed significantly in the last years, the linkage to the physical world, actual delivery or underlying assets is still far from perfected. What role could new constructs like sidechains or the lightning network, on top of the blockhain, play in transforming this important market function?

Financial Derivatives, Insurance and others

- Insurance is chiefly, a practice of “pooling” or aggregating risks, while financial derivatives aim to anticipate or foresee the outcome of one event. The nuances between Insurance, Derivatives and Gambling are subtle and often not too hard to confuse.
- Whether to hedge the risk of a potential future event or generate a gain from it, these industries are important pieces of the global financial system, highly regulated and hugely impactful in the global business environment.
- Several challenges still exist, for the insurance industry to harvest the potential advantages that blockchain solutions might provide :
  - Underwriting
  - Claims management
  - Solvency reporting
  - Regulatory oversight
  - Regulation is often inflexible in terms of capital reserves, investment allocations of the insurance premiums and pricing guidelines

In DFIN 513, we examine how close and how far an application for these markets is, and what elements it would need to exist.

Auditing, Accounting and Fin. Controls

- Accounting has been an integral part of how businesses and countries operate globally, how tax systems operate and function, and how financial planning and budgets takes place. Moreover, it additionally provides a system of authority and accountability in financial decision making and corporate governance globally.
- How could an immutable ledger with global, or local, transparency and specific transaction rights help us improve existing systems, accounting standards, taxation and financial planning and controls ? Probably, more ways than one.
- For a company, it could algorithmically provide transparency and internal corporate governance controls and accountability by using multi-signature transactions to ensure everyone involved is participating, specifically structured HD wallets for intra-department spending, etc.
- Could such systems scale to work on a government level ? Could tax authorities use such systems to easily account for customer purchases and directly correlate them with business earnings ? Would such a structure allow citizens to audit their governments and how would that impact political processes?

We examine these (and more) further in the Msc in Digital Currency Courses.

Conclusions

Conclusions

- Financial services is an extremely complex, extremely large and extremely profitable industry, protected by significant barriers to entry. It serves the needs of developed world consumers reasonably well, but leaves a large percentage of the population unbanked and imposes significant mutualized losses on customers and taxpayers

- Early investment to date in cryptocurrency-based financial services has focused on “building block” technologies like exchanges, wallets and merchant processors.

- This is a logical starting point as this infrastructure is needed for higher-order financial services to emerge. Asset management (aka Bitcoin funds) are also under development but they fit in more comfortably into the existing financial system

Conclusions

- Cryptocurrencies have to trigger a virtuous cycle of market liquidity, consumer acceptance and merchant acceptance in order to reach their full potential as a payments system. Theoretically and at scale, they should represent a more cost-effective and more integrated system. They only reach their full promise however if they can start serving in a closed-loop capacity without constant exchanges with the existing financial system and sovereign currencies.

- Many businesses will need to be rebuilt and duplicated across national borders or currency zones. This means that the overall globalization of financial infrastructure will require significant time and investment.

- More firms are starting to see potential in Bitcoin's blockchain technology e.g. in terms of interbank funds transfer or settlements, including r3cev as explained by our guest interviewee during the last session.

Further Reading

Further Reading 1/3

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- NASDAQ looking into Bitcoin futures and Blockchain strategy

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- Microsoft helps launch world's first blockchain-based investment product

https://news.microsoft.com/en-gb/2018/03/21/microsoft-azure-helps-nivaura-launch-worlds-first-blockchain-based-investment-product/

- Wall Street rethinks blockchain projects as euphoria meets reality

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