



MIT SLOAN SCHOOL OF MANAGEMENT
15.483 CONSUMER FINANCE:
MARKETS, PRODUCTS, AND FINTECH

SPRING 2018

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Lecture Notes 11

**Bitcoin and Payments
Technologies**

Which is worth more? Why?



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Stone Money

Exchange is an important part of life in Yap as it is in all cultures. Yapese have used intriguing stone money for centuries. It is found nowhere else in the world. The first stone money quarrying in the Palau Islands may have begun as far back as 125 A.D. The sparkling rock is a form of crystalline calcite that is found primarily in the colorful glistening walls of limestone caverns.

Hundreds of voyages followed the initial trip to Palau. Many men attempted the Stone Money hazardous passage and more than a few perished in the process. The 250 mile canoe journey took about five days one way if the weather was good and required skillful sailing. The larger pieces of stone money that are now a familiar fixture in most Yapese villages was an arduous task to make and return to Yap, increasing its value greatly.

Gold in many countries = stone wheels in Yap



US \$100 1922 gold certificate; Currency from 1822 to 1928

Images of gold and silver certificates are in the public domain. Source: Wikimedia Commons.



US \$1 1928 Silver Certificate

What is a cryptocurrency? Is Bitcoin a currency?

- Exists only in electronic form, stored as zero's and one's.
- Fine: Like bank reserves or U.S. Treasury debt.



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Means of exchange

- Means of exchange: bitcoin is for some transactions only

Unit of account

- Unit of account: not much, back to local currency

Store of value

- Store of value: not very good: volatile

What are the advantages of Bitcoins?

The lowest fees out there

Bitcoin's high cryptographic security allows it to process transactions in a very efficient and inexpensive way. You can make and receive payments using the Bitcoin network with almost no fees. In most cases, fees are not strictly required but they are recommended for faster confirmation of your transaction.

Protection against fraud

Any business that accepts credit cards or PayPal knows the problem of payments that are later reversed. Chargeback frauds result in limited market reach and increased prices, which in turn penalizes customers. Bitcoin payments are irreversible and secure, meaning that the cost of fraud is no longer pushed onto the shoulders of the merchants.

Fast international payments

Bitcoins can be transferred from Africa to Canada in 10 minutes. In fact, bitcoins never have any real physical location, so it is possible to transfer any amount anywhere with no limits, delays, or excessive fees. There are no intermediate banks to make you wait three business days.

No PCI compliance required

Accepting credit cards online typically requires extensive security checks in order to comply with the PCI standard. Bitcoin still requires you to [secure your wallet](#) and your payment requests. However, you do not carry the costs and responsibilities that come with processing sensitive information from your customers like credit card numbers.

Get some free visibility

Bitcoin is an emerging market of new customers who are searching for ways to spend their bitcoins. Accepting them is a good way to get new customers and give your business some new visibility. Accepting a new payment method has often shown to be a clever practice for online businesses.

Multi-signature

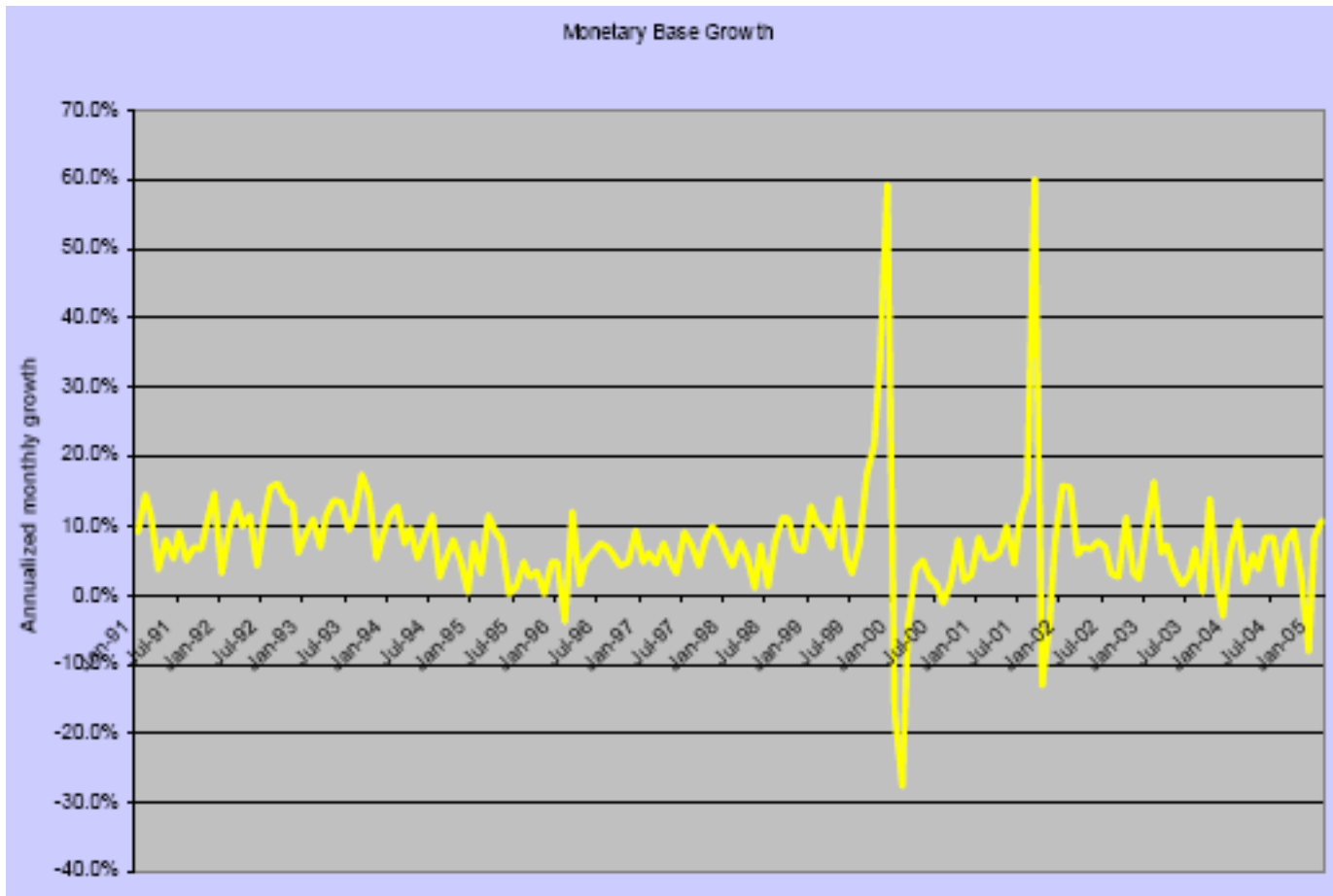
Bitcoin also includes a multi-signature feature which allows bitcoins to be spent only if a subset of a group of people authorize the transaction. This can be used by a board of directors to prevent any member to make expenditures without enough consent from other members, as well as to track which members allowed each payment.

Accounting transparency



















The two sides of the (Bit)coin

- ✓ Low-fee peer-to-peer transactions across countries and currencies
- ✓ Anonymous (or completely not)
- ✓ Safe – fraud protection
- ✓ Supply not controlled by government: no way budget gap leads to hyperinflation
- ✓ **Supply limited by algorithm/mining (see costs of no limit: Venezuela)**
- ✓ Free of lots of government regulations
- ✓ No commercial banking system and no risk of collapse of money multiplier

- ✗ Slow – algorithmic delay for transactions
- ✗ Anonymous (or completely not)
- ✗ Risk of theft (e.g. Mt Gox lost Bitcoins)
- ✗ Controlled by majority of miners
- ✗ **Supply not controlled by government: prices not stable (next slide)**
- ✗ No associated banking system (Yet. Big incentive to create.)
- ✗ Vulnerable to government regulation
- ✗ No necessary use (e.g US taxes paid in dollars)
 - **Value comes purely from the expectation that others value it in the future**
 - **Vulnerable to better national currency or virtual currency**



Which cryptocurrency wins?

#	Name	Market Cap	Price	Volume (24h)	Circulating Supply	Change (24h)	Price Graph (7d)
1	 Bitcoin	\$250,130,520,788	\$14,897.70	\$17,768,100,000	16,789,875 BTC	-9.90%	
2	 Ethereum	\$107,158,688,754	\$1,106.42	\$7,919,020,000	96,851,728 ETH	-2.11%	
3	 Ripple	\$94,934,923,145	\$2.45	\$2,965,700,000	38,739,144,847 XRP *	-27.21%	
4	 Bitcoin Cash	\$39,730,408,261	\$2,350.87	\$1,353,230,000	16,900,300 BCH	-19.17%	
5	 Cardano	\$23,111,598,094	\$0.891408	\$267,642,000	25,927,070,538 ADA *	-12.97%	
6	 NEM	\$14,463,899,998	\$1.61	\$82,676,900	8,999,999,999 XEM *	-10.66%	
7	 Litecoin	\$13,736,980,151	\$251.28	\$1,140,050,000	54,669,108 LTC	-13.78%	
99	 ZClassic	\$338,642,537	\$187.12	\$52,532,300	1,809,800 ZCL	-14.22%	
100	 Bancor	\$334,552,412	\$8.21	\$19,534,400	40,772,871 BNT *	-0.21%	

Here's the winner!



Available after class from Prof. Parker at \$10,000 per  **bitcoin 2.0**



Image of Miracle of Science
café in Cambridge removed
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Should my business accept a crypto currency?

- The strategy seems sound: People are using the currency.
- But the move is **not costless**. There is the technological outlay, the workforce training, the issue of posting multiple prices and how to adjust and respond to market movements.
- Finally, there is the **risk** that is posed by holding a significant liquidity in cryptocurrency. What if it becomes worthless?

*These questions only highlight the risks of getting involved in different currencies when there are **already so many simple traditional means of payment***

- *From debit cards to credit cards*
 - *So many new and evolving means of payment such as Paypal, Alipay, and Apple pay.*
- Where will the future be?*

Wait, this is a deja vu!

This sounds like the history of money in the US prior to the founding of the Federal Reserve and a national currency 100 years ago:

- *Privately issued money*
- *Banking panics*
- *Financial collapses every decade...*

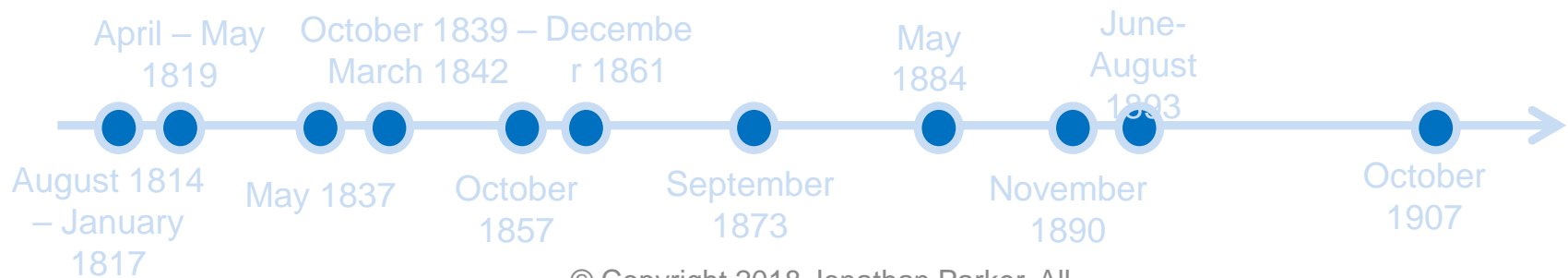


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1857 Bank Run

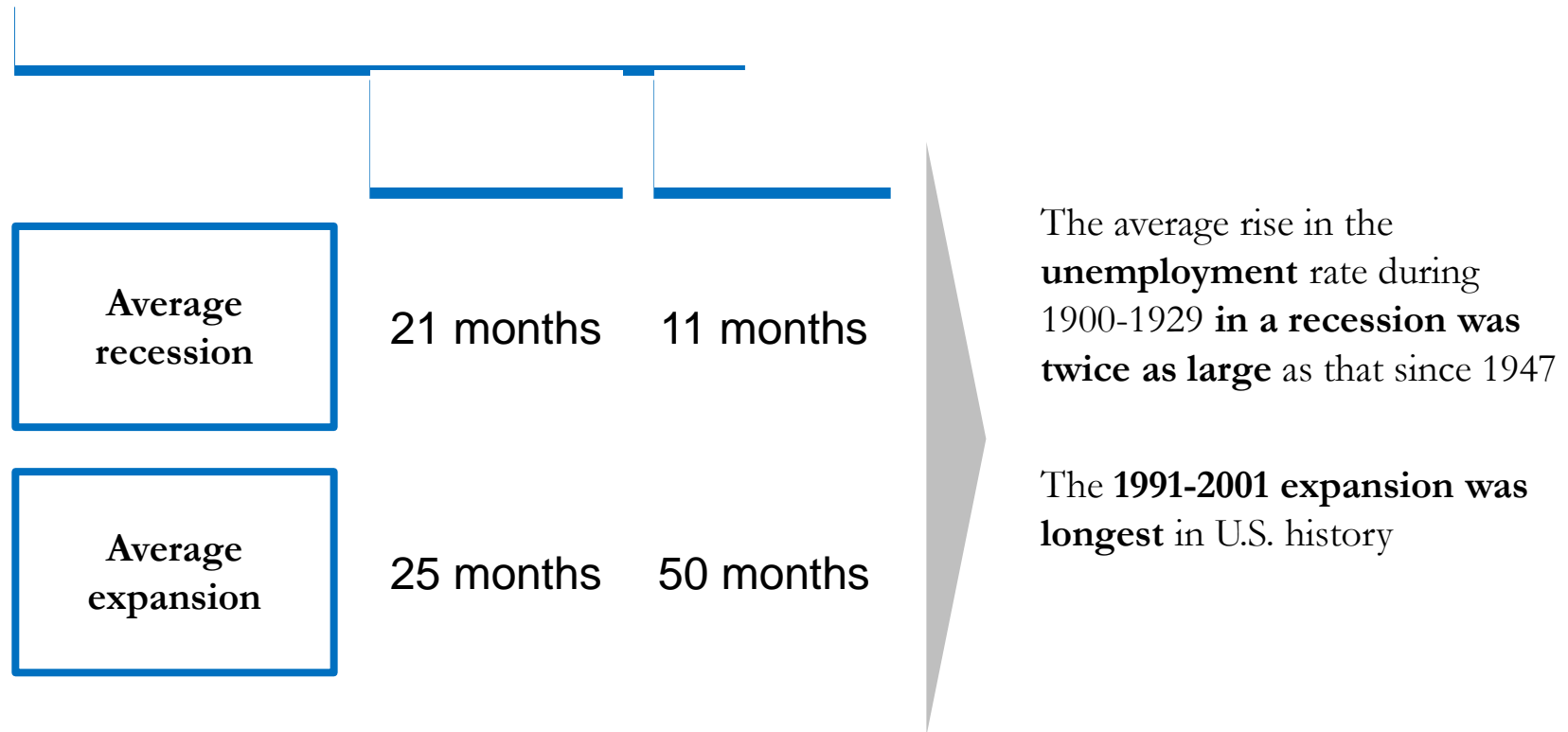


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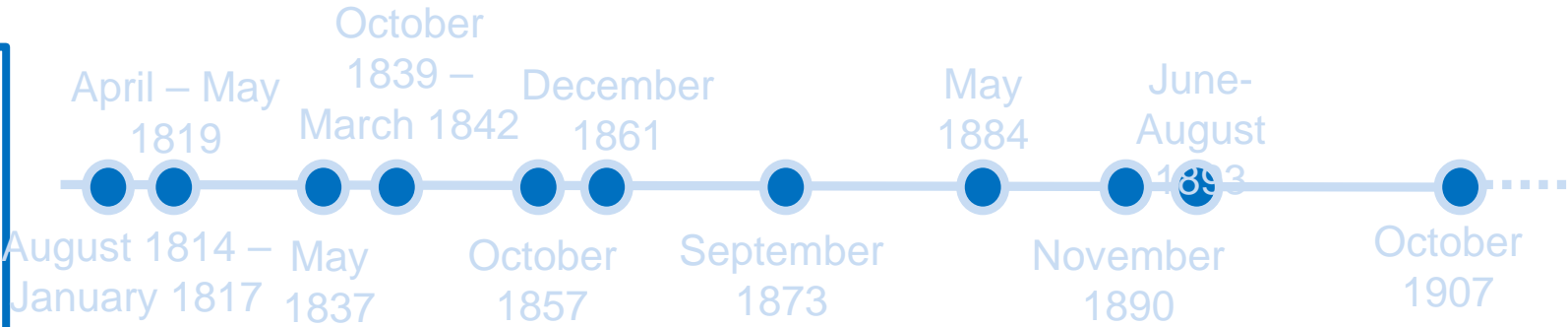


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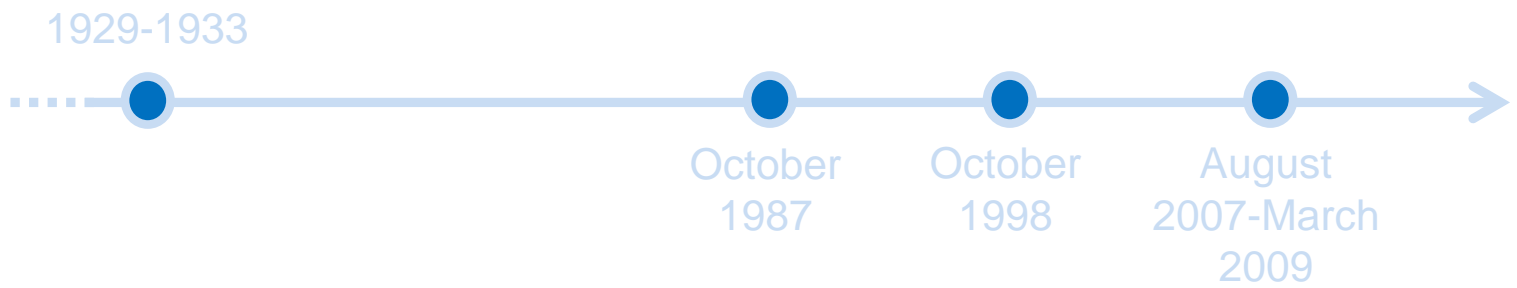
Before the Great Depression, Recessions Comparatively Deep and Long



“Free banking” period



Federal Reserve Act of 1913



Is the future government crypto currency?

- Cash used to satisfy the need to make payments, then checks, then credit cards over long distances
- Now more transactions done from afar
 - Credit cards include fraud protection
 - Cryptocurrency is cheap and does not

ECONOMICS



Jan 12, 2017 | Wendy McElroy | 👁 157943 | 💬 129

Fedcoin: The U.S. Will Issue E-Currency That You Will Use

LEGAL TENDER PUBLIC AND PRIVATE

Bitcoin.com

Will this happen?

The Riksbank's e-krona project

Report 1

September 2017

Conclusion: Crypto currencies

- Money is a social construct
 - It has no value to one person alone
 - Network externalities
- Destined to have volatile value if private, can be stable if public and well-managed
- Most Bitcoin is not being used
 - Current demand not for transactions, but for speculation
- Private e-coin is **not** in limited supply
 - Profit motive may drive out decentralized currencies

Final thoughts on consumer finance & fintech

1. Dimensions

- Better analysis and advice (Roboadvising)
- Behavioral biases: exploitation and correction
- New platforms to “unbundle” products (P2P securitization)
- New data analysis to better price (e.g. credit cards)
- New technology to reduce costs (blockchain, index ETF)

2. Future

- Innovations partly a race between consumers and lenders
- Changes revenue sources and profit models
- Existing big players innovating, adapting, and purchasing
 - Examples: JPMC and Blockchain, Mint, & On Deck
- Existing success stories not yet stress tested by recessions

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