

FinTech: Shaping the Financial World

April 15, 2020

Class 6: Overview

- Payment Systems
- Payment Trends
- Payment System 'Pain Points'
- Real Time Gross Settlements
- Payment Companies Landscape
- Stable Coins, Crypto Projects & Tokenization
- Facebook Libra & China DCEP

Class 6: Readings

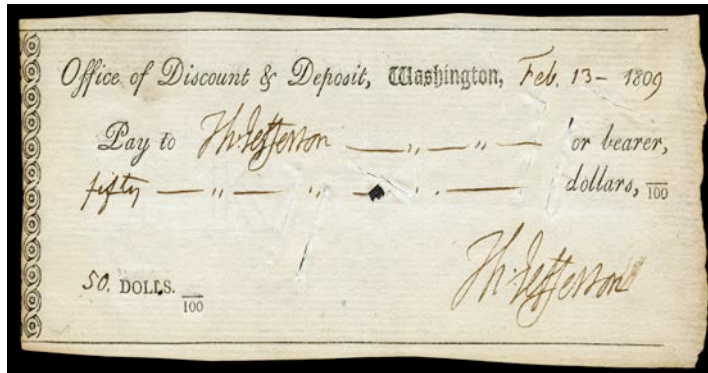
- *'The Digitalization of Payments and Currency: Some Issues for Consideration'* Lael Brainard, Federal Reserve Board
- *'The Payment Systems Space'* MIT Cryptocurrency Online Course
- *'7 Key Payments Innovations in Fintech for 2020'* Codete
- *'9 Payment Trends That Will Shape 2020'* Estelle Mense, BlueSnap

Class 6: Study Questions

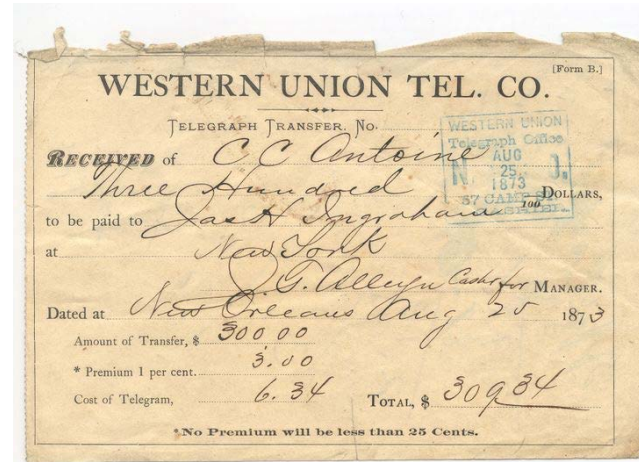
- What are the challenges and opportunities in the current payment system architecture?
- What lessons can be drawn from Big Tech payment innovations such as Alipay, WeChat Pay, M-Pesa, Paytm, Kakao Pay, Amazon Pay, Apple Pay, & Google Wallet? What lessons from fintech disrupters such as Plaid, Square, Stripe, Toast, TransferWise, Venmo, etc.? What are incumbents such as the major banks as well as Visa, Mastercard and PayPal responding to the changing landscape?
- Do stable value coins and tokenized assets fill real gaps in payments and the financial markets? If so, will stable coins or tokenization take off or just be a passing fad?

Payment Systems

A Method to Amend and Record Entries on Ledgers for Money
Authorizing, Clearing and Recording Final Settlement



Personal Check
Thomas Jefferson
1809

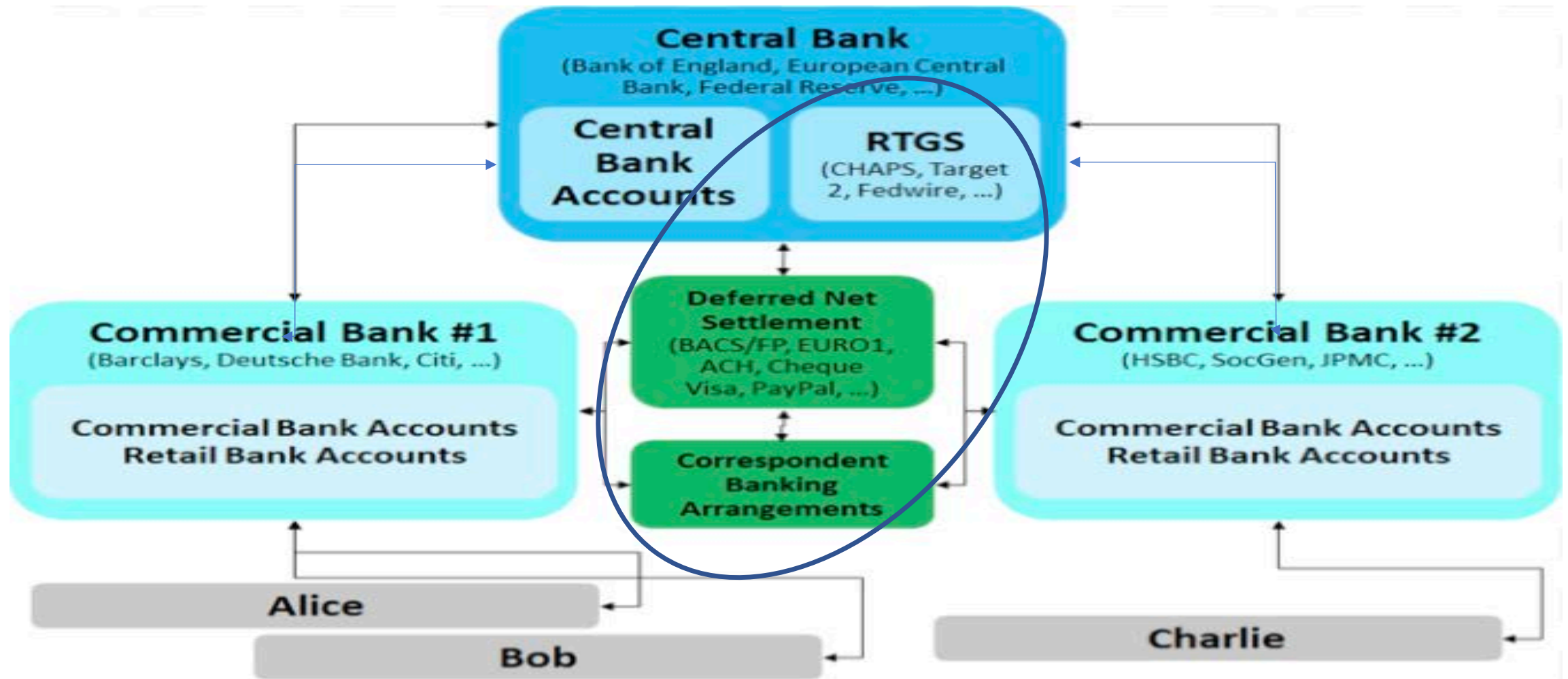


Western Union
Telegram
1873

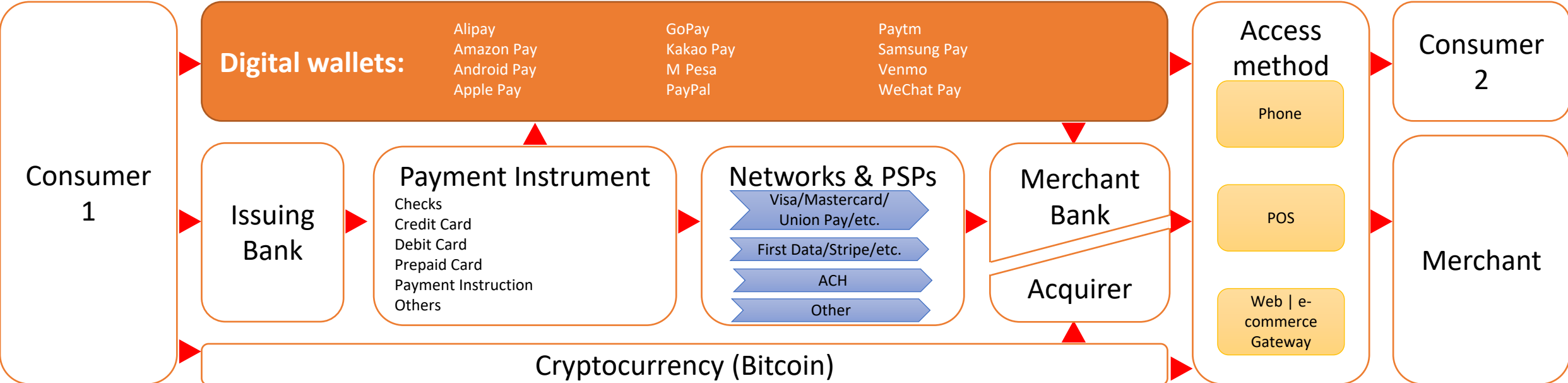


Telex
1950s – 1970s

Payment Systems




















Modern Payment Systems



Global Payment Trends

Global eCom payment methods

Global POS payment methods


















	2019	2023*		2019	2023*
 Digital/Mobile Wallet	41.8%	52.2%	 Cash	30.2%	18.7%
 Credit Card	24.2%	18.8%	 Debit Card	24.3%	26.3%
 Debit Card	10.6%	8.8%	 Digital/Mobile Wallet	21.5%	29.6%
 Bank Transfer	9.0%	9.3%	 Credit Card	20.9%	22.3%
 Charge & Deferred Debit Card	5.0%	3.0%	 Charge Card	2.1%	2.1%
 Cash on Delivery	4.5%	2.7%	 Pre-Paid Card	1.0%	1.2%
 Buy Now Pay Later	1.6%	2.8%			
 PostPay	1.3%	0.9%			
 Pre-Paid Card	1.0%	0.5%			
 PrePay	0.6%	0.3%			
 Other	0.6%	0.3%			

*Forecasted

North America Payment Trends

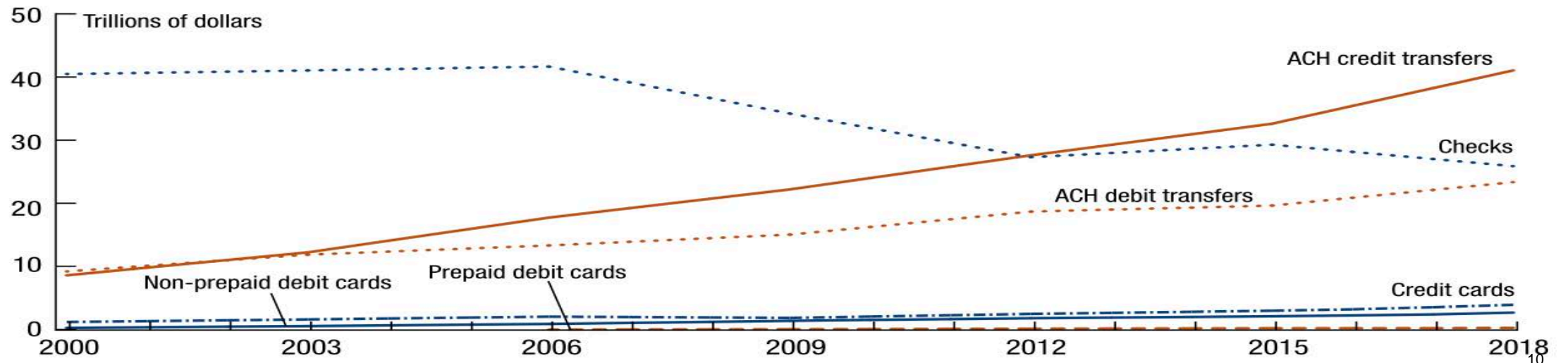
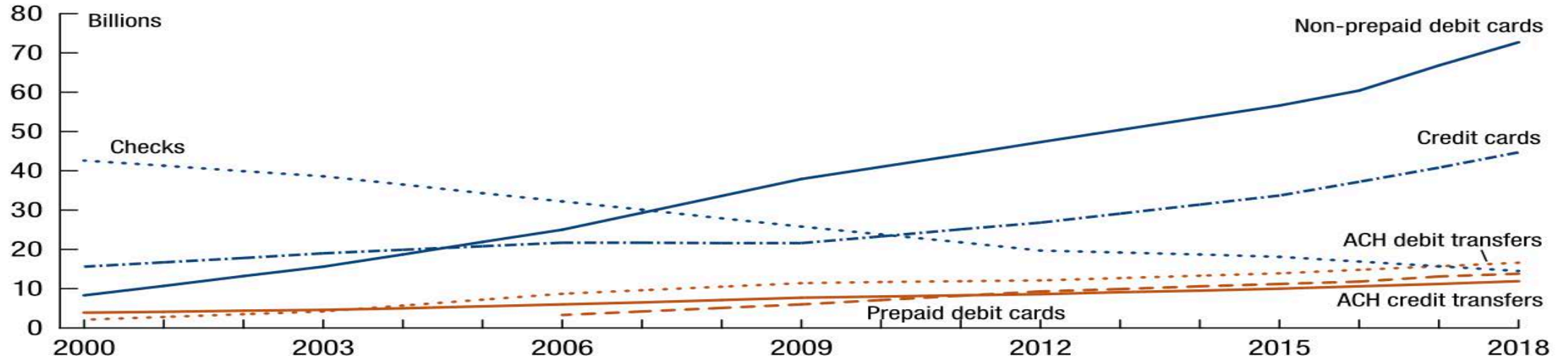
North America eCom payment methods

North America POS payment methods

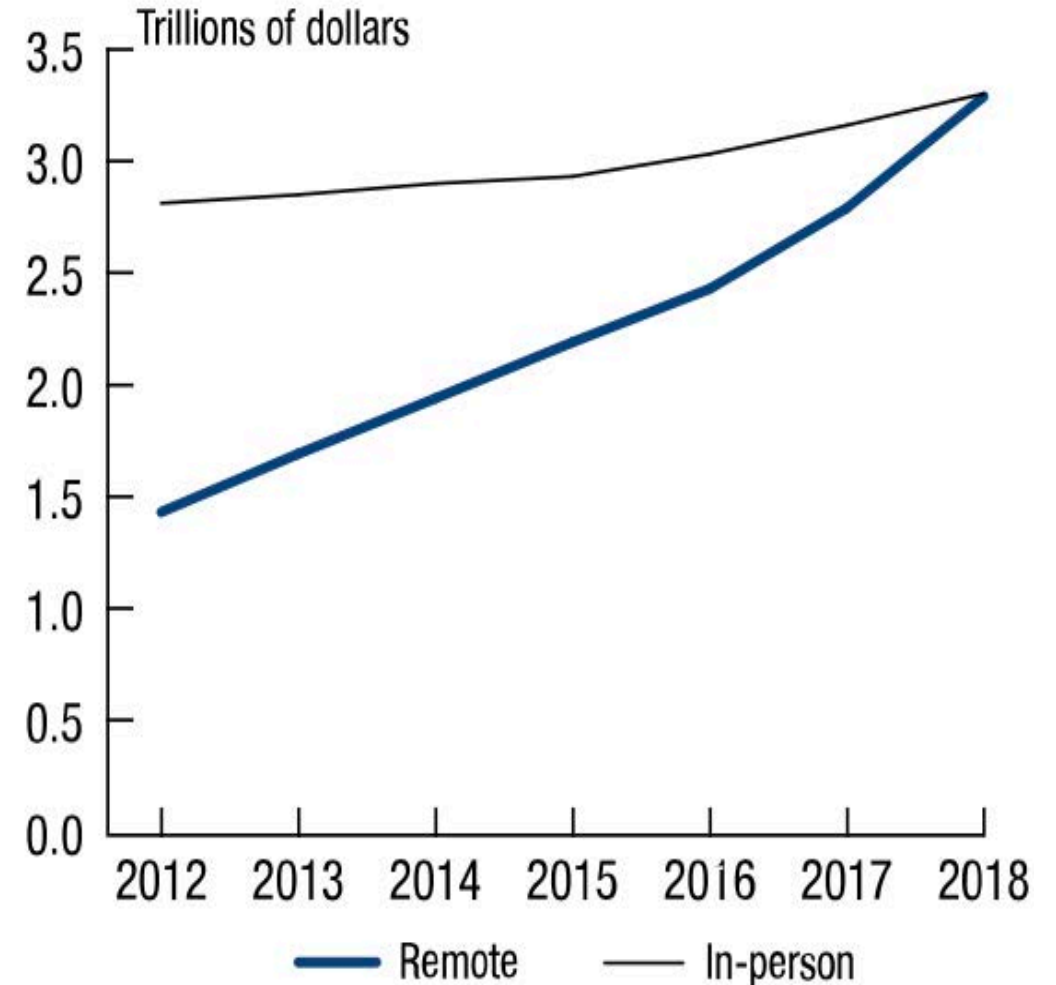
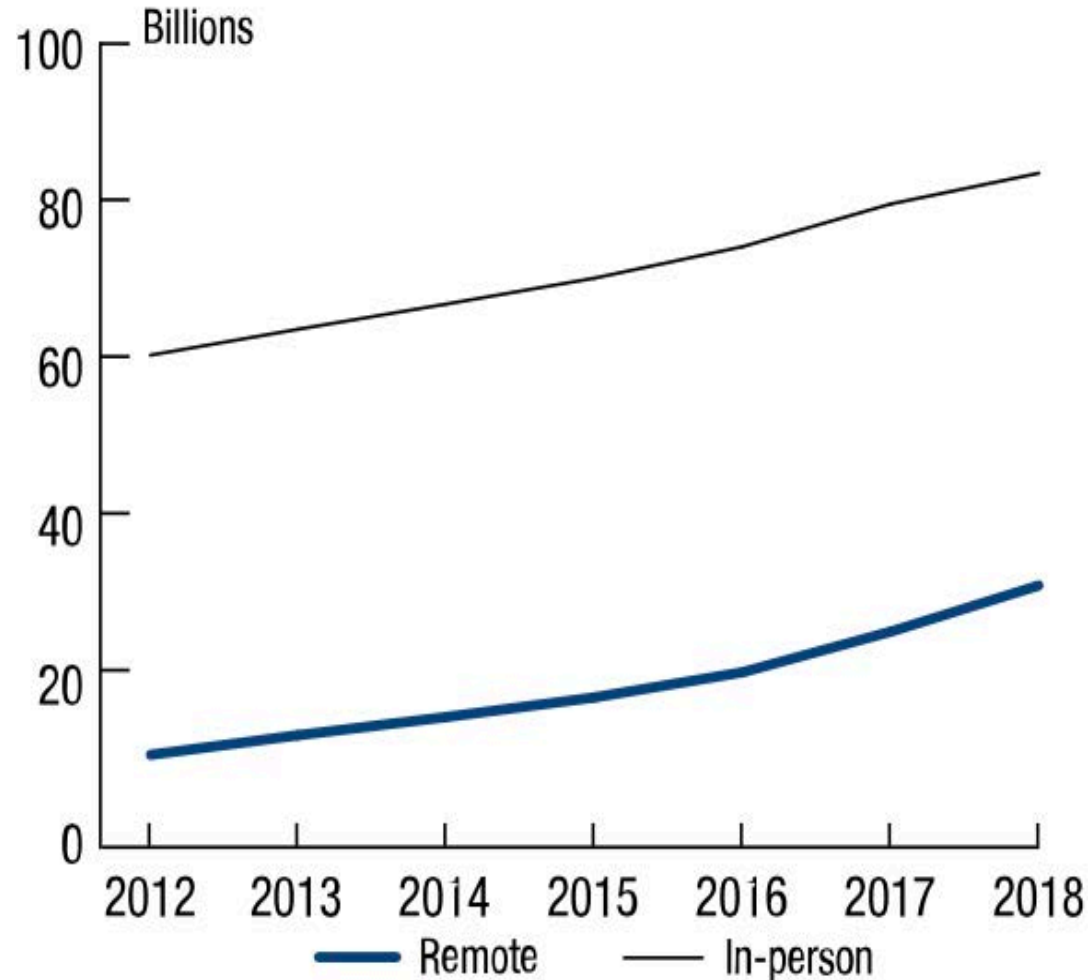
	2019	2023*		2019	2023*
 Credit Card	34.4%	26.8%	 Credit Card	40.1%	41.6%
 Digital/Mobile Wallet	23.7%	36.6%	 Debit Card	33.5%	31.5%
 Debit Card	17.6%	15.2%	 Cash	14.6%	10.8%
 Charge & Deferred Debit Card	10.5%	9.1%	 Digital/Mobile Wallet	6.0%	10.1%
 Bank Transfer	5.9%	6.3%	 Charge Card	3.9%	4.0%
 Cash on Delivery	3.2%	1.7%	 Pre-Paid Card	1.9%	2.0%
 PostPay	1.0%	0.2%			
 Other	1.0%	0.3%			
 Buy Now Pay Later	0.9%	3.0%			
 Pre-Paid Card	0.9%	0.3%			
 PrePay	0.9%	0.4%			

*Forecasted

U.S. Payment Trends



U.S. Card Payment Trends



Courtesy of the Federal Reserve and is in the public domain.

Note: Includes General Purposes Credit & Debit Cards

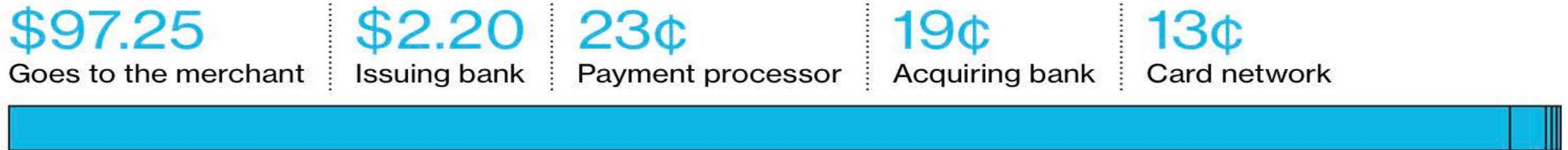
Source: 'The 2019 Federal Reserve Payments Study' (December 2019)

Payment System 'Pain Points'

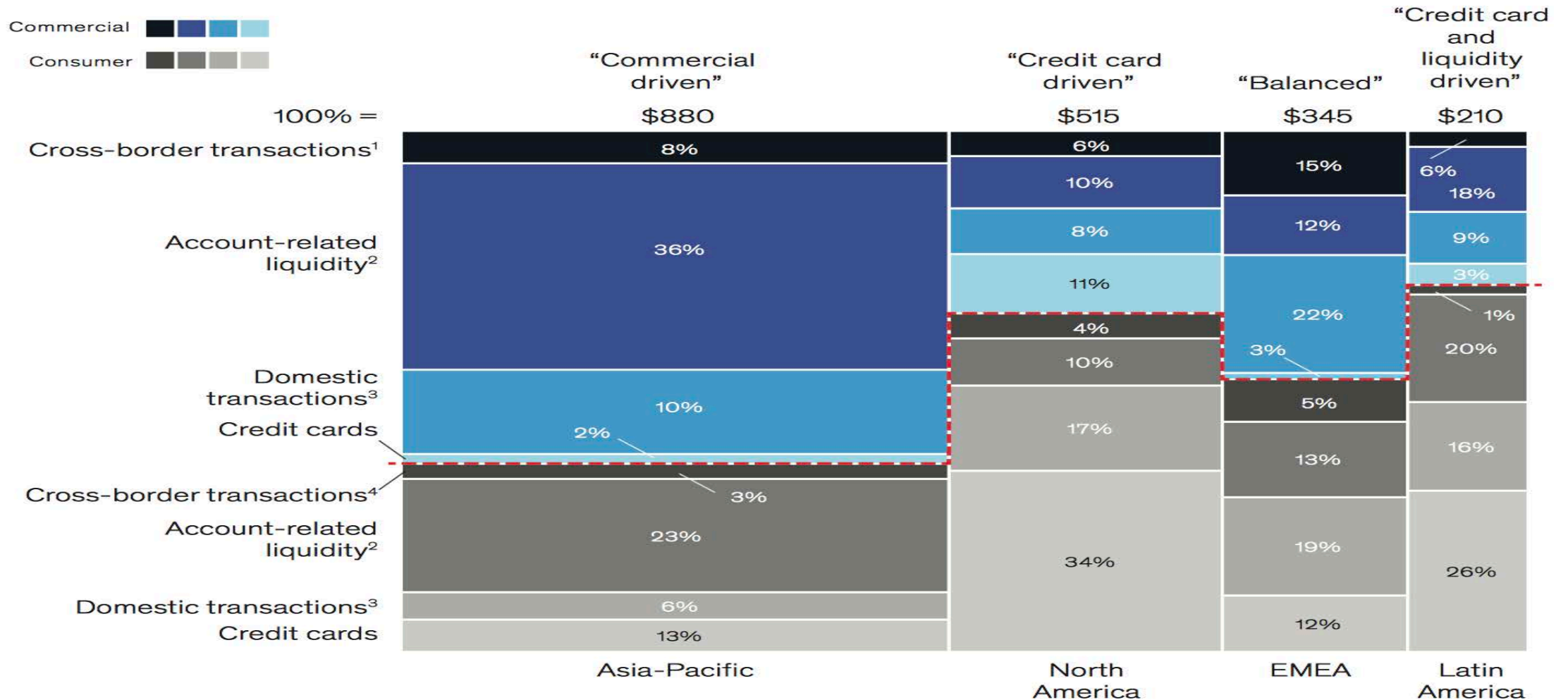
- Chargebacks
- Complexity
- Costs
- Cross Border Payments
- Data Privacy
- Delayed Settlement
- Financial Inclusion
- Fraud
- Public Policy Compliance

Credit Card Transaction Breakdown

In Typical \$100 Purchase



Payments Global Revenues - 2018



¹ Trade finance and cross-border payments services (B2B, B2C).

² Net interest income on current accounts and overdrafts.

³ Fee revenue on domestic payments transactions and account maintenance (excluding credit cards).

⁴ Remittance services and C2B cross-border payments services.

Real Time Gross Settlements (RTGS)

- Early Large Value Models: Fed Wire (1970); UK CHAPS (1984); Eurozone TARGET (2002); China CNAPS HVPS
 - Operational Hours Limited
- SWIFT (Society for Worldwide Interbank Financial Telecommunications, founded 1973) Facilitates Interbank Payment Messaging
- Real Time Retail 'Instant' Payment Systems (24x7x365)
 - Australia NPP (2018); China IBPS (2010); Eurozone TIPS (2018); India NEFT (2019); Japan Zengin (2018); Mexico SPEI (2015); UK FPS (2011)
- U.S. Projects
 - The Clearing House: Real-Time Payment Network (2017)
 - Federal Reserve: FedNow Service (announced 2019, expected 2024)

FinTech – Payments

Big Tech



2003



2007



2007



2011



2013



2014

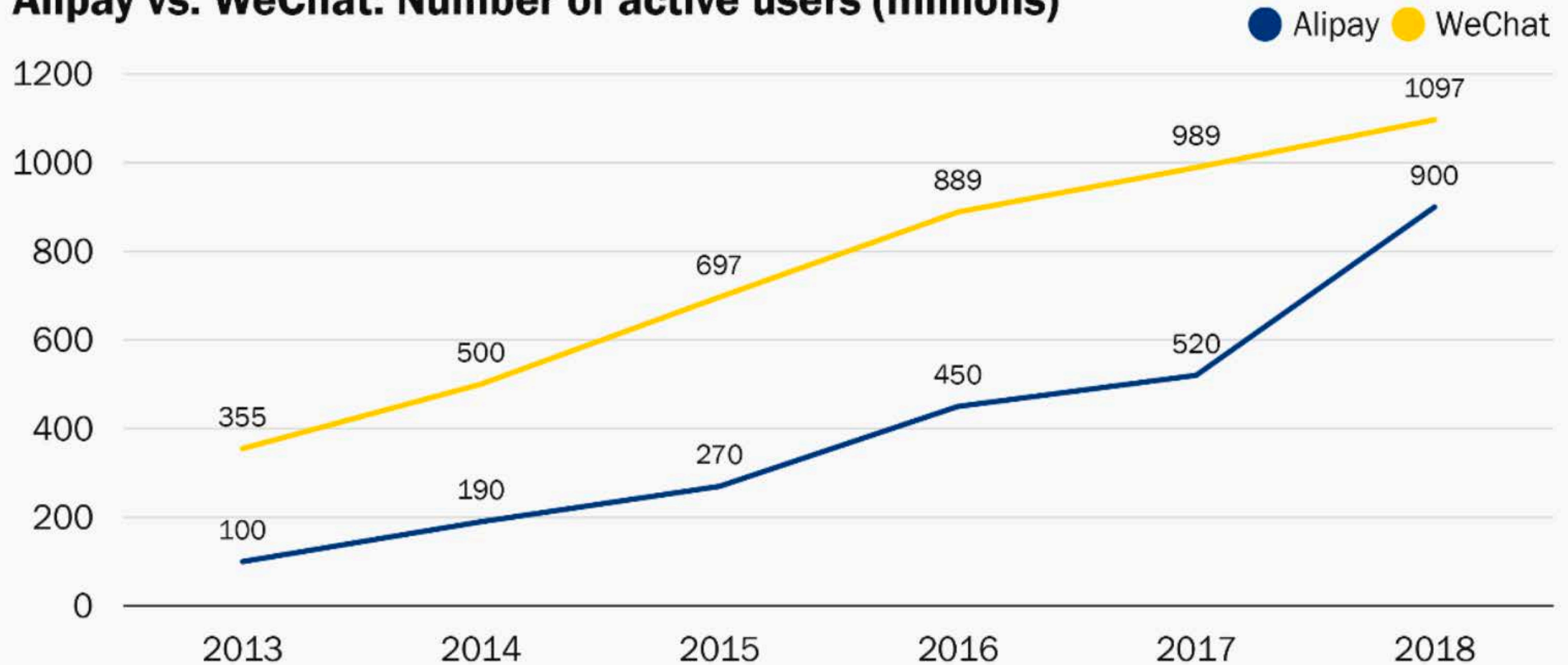


2014

Startup Unicorns



Alipay vs. WeChat: Number of active users (millions)



Source: Statista, China.org.cn, XinhuaNet, Technisia

B | Economic Studies
at BROOKINGS

Facebook - Payments

- Facebook Credit (2009):
 - Virtual Currency in 15 currencies,
 - Terminated 2013
- Facebook Messenger payments (2015):
 - P2P & Charitable Payments offered in US, UK, & France
 - Terminated P2P in UK & France 2019
- WhatsApp Pay (2018)
 - Pilot in India, to be Rolled Out Conditional on Data Standards
 - 1 Million Accounts Pending further Approvals
- Facebook Pay (2019)
 - Consolidated Ap for Facebook, Messenger, Instagram & WhatsApp
 - Announced 11/12/19

Payment Companies Landscape

- Commercial Banks & Bank Owned Payment Networks: 1,000s of Banks (1784 – now), The Clearing House (1853) 24 Large Banks; China UnionPay (2002) 85 founding Banks
- Card Companies: Visa (1958) \$373B; Mastercard (1966) \$268B; AmEx (1850) \$76B; Discover (1985) \$12B
- Payment Services Providers: Fidelity National Information Services (2001) \$77B; Fiserv (1984) \$67B; Global Payments (2000) \$45B
- Online, Merchant & Cross Border focused: PayPal (1998) \$124B; Square (2009) \$26B; Adyen (2006) \$26B; FleetCor Technologies (2000) \$19B; Wirecard (1999) \$15B; Western Union (1851) \$8B; StoneCo (2000) \$7B; Euronet (1994) \$4.7B; ACI (1975) \$3.2B
- Private Companies: Stripe (2009) \$35B; Paytm (2010) \$10B; Klarna (2005) \$5.5B; Plaid (2013) \$5.3B; Toast (2013) \$4.9B; TransferWise (2010) \$3.5B; Payoneer (2005) \$1+B

Payment Company Recent Mergers

'Incumbent' Payment Service Provider 2019 / 2020 Megadeals:

- Fidelity National Information Services - Worldpay: \$34B (+ \$9B Debt)
- Fiserv - First Data: \$22B (+ \$17B Debt)
- Global Payments – Total Systems Services: \$21.5B
- Worldline – Ingenico: \$8.6B

API / Data Aggregator 2020 Deals:

- Visa – Plaid: \$5.3B
- Sofi – Galileo: \$1.2B

Stablecoins & Messaging App Crypto Projects

- Retail Stable Value Tokens:
 - Tether, USD Coin, Paxos Standard, TrueUSD, DAI, Binance USD
- Wholesale Stable Value Token Projects:*
 - Fnality (aka Utility Settlement Coin), JPM Coin (JP Morgan), Wells Fargo (Wells Fargo Digital Cash), IBM Blockchain World Wire
- Messaging App Token Projects:
 - Facebook Libra, Telegram GRAM, LINE (Japan) Link

* Mizuho Financial Group's J-Coin digital money offering has similarities but does not use token technology

Payment Cryptocurrency Tokens

- Bitcoin (2009) - \$128B market value
- XRP (2013) - \$8.5B - for Ripple's xRapid cross-border application
- Bitcoin Cash (2017) - \$4.4B - hard fork off Bitcoin, 32MB block size
- Bitcoin SV (2018) - \$3.5B – hard fork off Bitcoin Cash, 128MB block size
- Litecoin (2013) - \$2.8B – Bitcoin fork, 2.5 minute block times, ASIC resistance
- Stellar (2014) - \$1B - Stellar Consensus Protocol with ledger chains
- IOTA (2017) - \$455M – designed for micropayments on IoT
- Privacy Coins - \$2.3B total - Monero (2014), Dash (2014), Zcash (2016), etc.

Tokenization Goals

Broadened Access, Enhanced Liquidity & Efficiency through:

- Extending Settlement to 24 hours by 7 days per week
- Real time Instant Settlement with Finality of Transfer
- Borderless Permissionless Censorship Resistant Exchange
- Peer to Peer and possible related Disintermediation
- Broader Investor Base
- Smart Contracts and Automation
- Fractionalization

For:

- Payments
- Payments vs. Payments (PvP)
- Payment +/- Security side of Delivery vs. Payment (DvP)
- Atomic Swaps of Value

Facebook Libra Design Decisions



- Promote Libra as Global Digital Currency & Payment Solution
 - “The goal of the Libra Blockchain is to serve as a solid foundation for financial services, including a new global currency, which could meet the daily financial needs of billions of people.”
- Create Multicurrency Libra Reserve to back Libra
 - Government Securities & Bank Deposits - US, Euro, UK, & Japan
- Pay No interest on Libra
- Use ETF mechanisms for Libra Issuance and Redemptions
- Issue Libra Investment Token (LIT) earning Interest on Libra Reserve & to Promote Customer Adoption

Facebook Libra Design Decisions



- Use Libra Blockchain for a permissioned distributed ledger
- Develop Move language so apps can run on top of network
- Set up Libra Association as Swiss non-profit to Manage Libra Reserve and Libra Network
- Recruit 100 Large Organizations as Libra Association members
- Set up subsidiary Calibra offering services & custody tokens
- Offer digital custodial Calibra Wallet for Libra tokens

Libra vs. China DCEP



	Libra	Digital Currency Electronic Payment (DCEP)
Name of currency	Libra	Digital Currency Electronic Payment (DCEP)
Issuer	Libra Association led by Facebook	People's Bank of China (PBoC)
Blockchain Type	Permissioned blockchain (accessible to association members only)	Centralized private network controlled by PBoC
Peg	Basket of currencies including USD, EUR, JPY, GBP and SGD	Renminbi (RMB)
Status	Release Date TBC	Release Date TBC

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