



Private and public money and payments in the 21st century

The Hayek Group

Reno, October 14, 2021

* Views expressed are strictly the speaker's.



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- Money
- The electronification of payments
- Cash
- Reigning electronic payment systems
- Interbank payment systems
- Digital currencies
 - Cryptocurrencies
 - Stablecoins
 - Central bank digital currencies (CBDCs)
- The Fed
- King Dollar
- Outlook



Taken for granted

Money

- Money is a store of value, unit of account, and medium of exchange.
- In 2021 the world operates substantially on fiat money.
- Federal Reserve Notes (cash) and deposits at the Fed are central bank money.
- Consumers and businesses rely principally on commercial bank money.
- For much of America's history money was private, bank-issued banknotes.

Electronification of payments

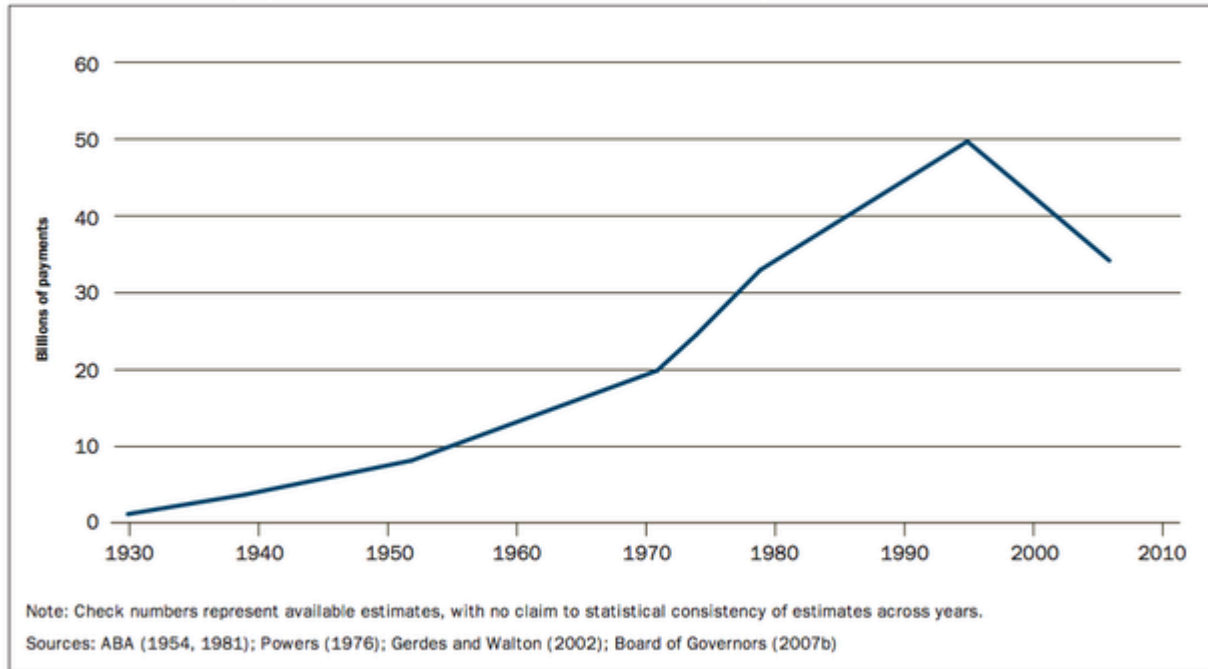
- Diners Club launched 1950
- First ACH association formed to handle electronic payments in 1972 by California banks
- By 2019 17.3% and 24.4% of consumer payment volume and transactions respectively were paper-based, principally cash and checks. 68.3% and 67.6% of consumer payment volume and transactions respectively were card-based systems. –a)
- US 2019 per capita card payments were 439 –b)
- While the Covid-19 pandemic increased demand to hold cash, it accelerated electronic systems' displacement of cash for payments.
- Electronic payments offer greater convenience, reach, security, safety, record-keeping, consumer protection, and other benefits.

(a- Nilson Report, December, 2020, p. 6

(b- Nilson Report, October, 2020, p. 7

Paper check payments crested in 1995 at ~ 49.5 billion –a)

Figure 3
Number of check payments in the United States, selected years



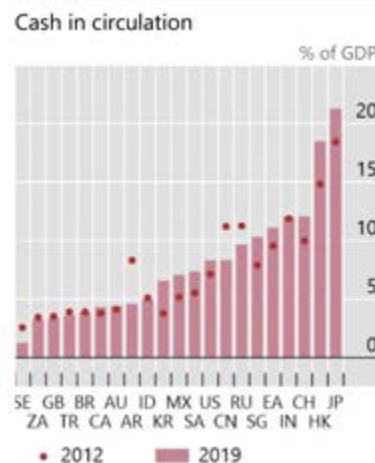
- By 2018 US check payments had declined to 14.5 billion –b)
- Consumers have reduced check use faster than businesses.
- But payment systems have long tails.

(a- Matt Philipps, “The Spectacular Decline of Checks,” the Atlantic, June 5, 2014

(b- “The 2019 Federal Reserve Payment Study,” the Federal Reserve System, December 19, 2019, p. 10

Cash

- It's a long-established payment network
- Anonymous
- Doesn't require an electronic device or internet connection
- Not subject to outages
- While cash continues to lose payment share worldwide, in many countries cash in circulation is increasing.

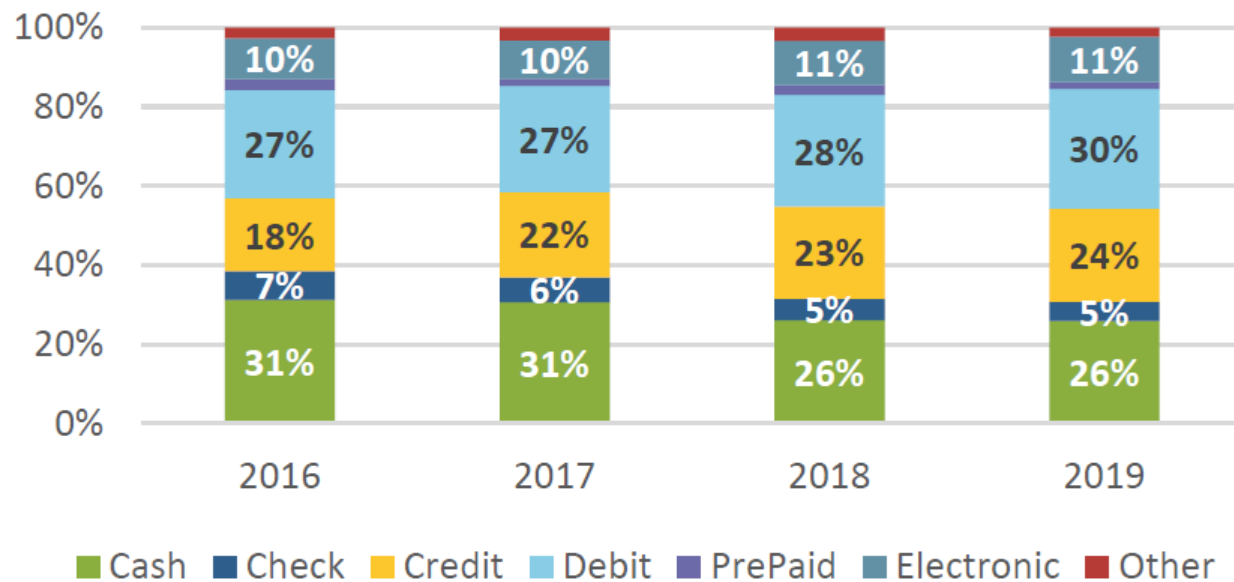


-a)

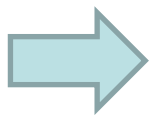
Cash

- Shadow economic activity is significant and conducted largely in cash. Worldwide across 158 countries it's estimated to average 31.9%. Percentagewise, the largest three shadow economies are Zimbabwe at 60.6% of economic activity, Bolivia 62.3%, and Georgia 64.9%. The smallest shadow economies are Austria at 8.9%, the US 8.3%, and Switzerland 7.2% -a)
- Many countries ban cash for large transactions. E.g., in France cash payments greater than €1000 between professionals are illegal.

Share of Payment Instrument Usage by Year (transactions)

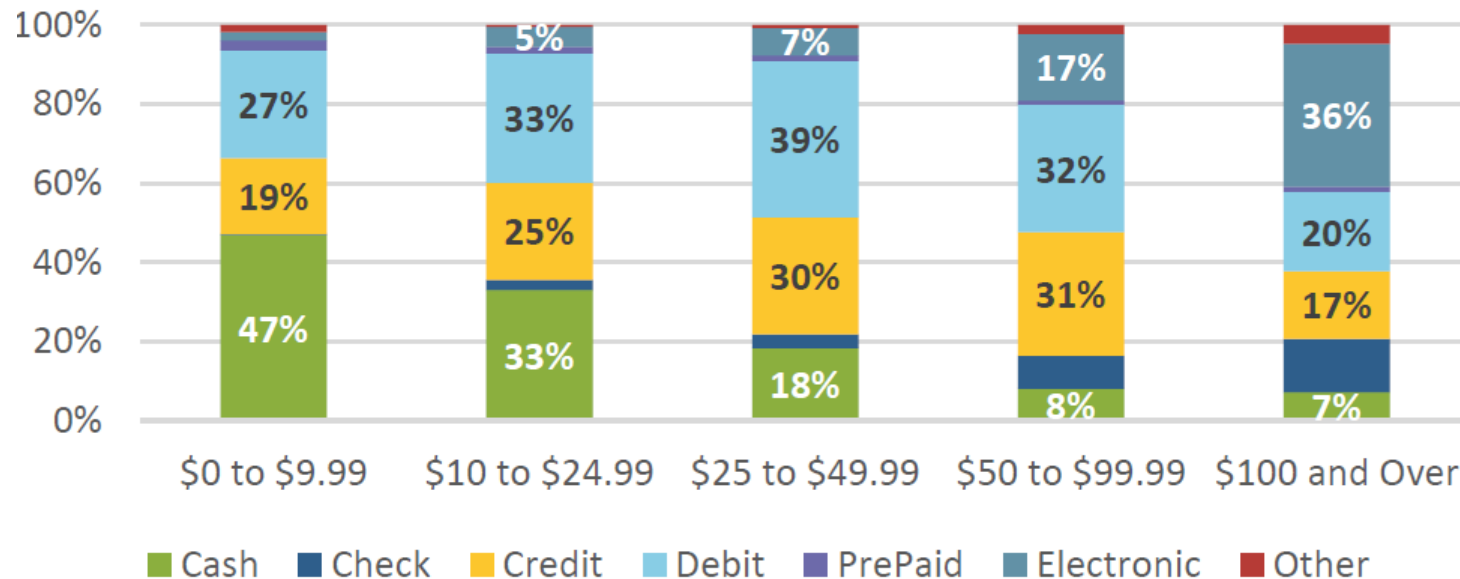


-a)

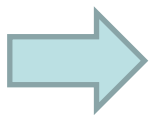


Cash payments continue to decline.

Payment Instrument Usage (transactions) by Purchase Amount - 2019



-a)



Cash is principally used for small payments, but even there electronic payments continue to take share

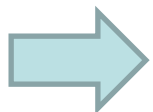
(a- Laura Kim, Raynil Kumar, & Shawn O'Brien, "2020 Findings from the Diary of Consumer Payment Choice," Cash Product Office Federal Reserve System, July, 2020, p.6

Reigning electronic payment systems

- The US payments system is substantially digital.
- Electronic payment systems are well-established, work well, and are habit for consumers, businesses and financial institutions.
- They include:
 - General-purpose “card” payment networks Visa, Mastercard, American Express, Discover, Star, NYCE, et al, and alternative payment system PayPal
 - P2P payment networks PayPal/Venmo, Square Cash, Zelle, Google Pay, Apple Pay, Western Union, MoneyGram, Wise, et al
 - Electronic Bill Payment & Presentment systems run by processors Fiserv and FIS, ACI Worldwide, Paymentus, et al, white-labeled by banks and billers

Interbank payment systems undergird payments

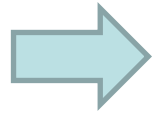
- A bank DDA is the anchor payments account for most American consumers and businesses
- Fedwire and bank cooperative the Clearing House's (TCH) CHIPS
- In 2020 there were 26.8 billion ACH payments ^{-a)}. The Fed and TCH are the principal operators.
- Instant interbank payments:
 - TCH RTP live since 2017
 - FedNow to launch in 2023
 - Card-rail-based credit-push systems Visa Direct, Mastercard Send, FIS, Fiserv, and Discover
 - Zelle (\$307 billion sent on 1.2 billion transactions in 2020) ^{-b)}



Realtime interbank payment systems enable new services and greater economic efficiency.

(a- NACHA

(b- "Zelle Closes 2020 with Record \$307 Billion Sent on 1.2 Billion Transactions," Zelle, May 19, 2021



Existing money's and payment systems' economic, legal, and social technologies and networks work well.

Digital currencies

- Cryptocurrencies
- Stablecoins
- CBDCs

Cryptocurrencies



- Epic Bitcoin launched 2009
 - The world’s first decentralized cryptocurrency bitcoin
 - A peer-to-peer network enabling value transfer over the internet
 - No financial intermediaries
 - Transparent, immutable distributed digital ledger
- Evangelists enthused it would upend fiat currencies and incumbent retail and P2P payment systems.
- Supply capped at 21 million. Current supply 18.84 million. –a)
- \$ 1.02 trillion market cap –a)
- Average transaction fee \$4.39. Additionally “miners” earn bitcoins by solving increasingly complex calculations to validate new blocks on the Bitcoin blockchain.

Bitcoin

- Being socialized among institutional and retail investors by support from traditional FIs, Square, PayPal, et al
- Uses
 - Speculative investment
 - Inflation hedge
 - In the past, means of moving capital out of China
 - Illicit commerce
- Not, however, fit for purpose as a payment system

Cryptocurrencies

- Distributed systems have performance issues, driven by design
- Systems to validate ownership and transactions and prevent double spending, e.g.
 - Proof of work
 - Proof of stake
 - Proof of history
 - Proof of space
 - Consensus
- Range from permissionless to gated, no governance to formal governance and control
- Weak performance relative to existing centralized payment systems like Visa and Alipay
 - Bitcoin processes ~ 5 transactions per second, new block ~ every 10 minutes
 - Visa capacity > 65,000 transactions per second –a)
 - Alipay capacity 256,000 transactions per second –b)

(a- Visa Fact Sheet, VisaNet capacity as of June 30, 2019

(b- “Alibaba Group Generated US \$25.3 billion (RMB168.2 billion) of GMV During the Year 2017 11.11 Global Shopping Festival,” Alibaba, November 12, 2017

Cryptocurrencies

- Lack of network critical mass and a path(s) to achieving it
- Few if any compelling licit use cases
 - Ripple attempting to disrupt interbank/FI cross-border payments.
- In electronic payment systems lack of intermediaries, clear governance and 24/7/365 support is a bug, not a feature
- Some traction in markets like Venezuela, notwithstanding state hostility
- Can attach debit cards to crypto accounts to spend in fiat currency across Mastercard's and Visa's global-acceptance networks. Crypto is backend asset.

Volatile values

- Money as a unit of exchange is more valuable if it's stable like a foot or a yard.
- By law the dollar is supposed to be “stable.” Relative to cryptocurrencies it is.
- Bitcoin's 52-week low and high were \$10,839.43 and \$64,888.99, respectively -a)

Bitcoin price



Ether price



Litecoin price

FRED  — Coinbase Litecoin

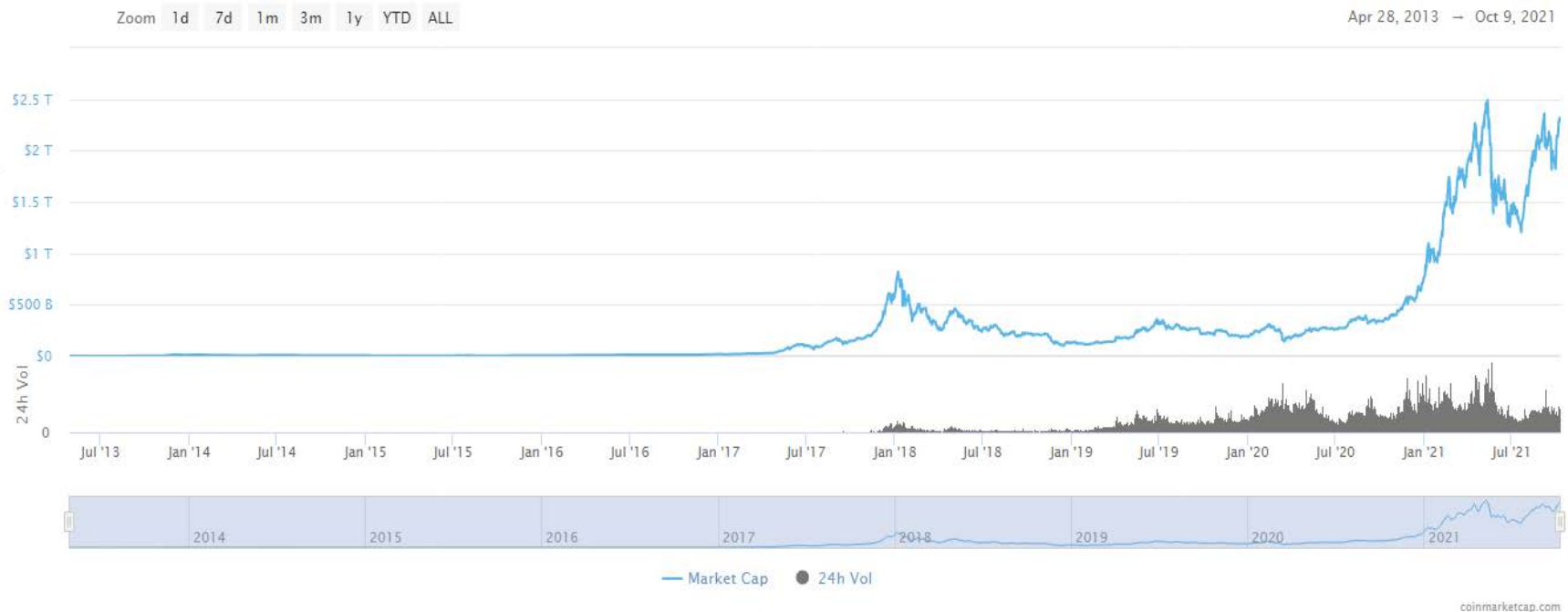


Shaded areas indicate U.S. recessions.

Source: Coinbase

myf.red/g/Hzhl

Total cryptocurrency & stablecoin market cap



-a)

- CoinMarketCap tracks 6479 cryptocurrencies and stablecoins, most of which are tiny, many of which won't be around in a few years.
- Only Bitcoin and Ether have greater than \$100 billion market caps.
- Bitcoin and Ether represent 44.5% and 18.2% of total crypto market cap, respectively. Cardano, Binance Coin, XRP, and Solana represent 3.1%, 3%, 1.8%, and 1.8%, respectively. -a)

(a- CoinMarketCap

Ether



- Proposed in 2013 by programmer Vitalik Buterin, developed by Buterin and Gavin Woods, and launched in 2015
- Second generation cryptocurrency enabling coding “smart contracts” on blockchain
- Migrating from proof of work to proof of stake block validation to improve performance

Third-generation cryptocurrencies

- The latest wave of cryptocurrencies like Cardano, Algorand, and Solana attempt to address blockchain performance issues.
- Solana claims to be the fastest blockchain supporting up to 65,000 tps. –a)

Regulatory and political cryptocurrency climate

- Most regulators are suspicious of and many outright hostile to cryptocurrencies.
- In May China banned financial institutions from holding or transacting in crypto. –a) In September the Middle Kingdom banned all crypto transactions and mining. China wants the PBOC to control money and payments. –a)
- Vietnam, Ecuador, Turkey and Russia ban crypto for payments.
- Illegal in Algeria, Nepal, Indonesia, and Bolivia
- In Colombia banks prohibited from facilitating cryptocurrency transactions
- In Egypt there's a religious decree prohibiting bitcoin.

(a- Alun John, Samuel Shen, and Tom Wilson, "China's top regulators ban crypto trading and mining, sending bitcoin tumbling," Reuters, September 24, 2021

Regulatory and political cryptocurrency climate

- There are legitimate concerns about cryptocurrencies facilitating illegal activity and consumer protection. But widely used as money, cryptocurrencies would undercut governments' money prerogative.
- A handful of jurisdictions have been crypto-friendly.
- Wyoming has been notably cryptocurrency-friendly, providing special-purpose state crypto-currency bank licenses.
- El Salvador made bitcoin forced legal tender.

El Salvador experiment



- Dollar legal tender since 2001, replacing the colón
- President Bukele claims 3 million downloads of government's e-wallet Chivo –a)
- Salvadoran Foundation for Economic and Social Development reports ~12% of Salvadorans have used bitcoin –a)
- 93% of businesses haven't accepted a bitcoin payment
- Foreign remittances make up 24% of El Salvador's GDP –b) Bukele believes bitcoin can lower remittance costs.
- Buying bitcoin can cost from 2 to 4.5%. Converting it to dollars at an ATM in El Salvador will cost 5%.
- The average cost of sending remittances to El Salvador in 2020 using traditional money-transfer services was 2.85%, falling from 5.3% in 2012 –c)

(a- Reuters, "El Salvador's bitcoin use grows but headaches persist," NY Post, October 8, 2021

(b- Steve Hanke and Nicholas Hanlon, "El Salvador, Bukele's Bitcoin Bunkum," National Review, September 16, 2021

(c- World Bank

Stablecoins

- DLT-supported electronic tokens backed by fiat currencies, fiat-currency-denominated assets, or other assets like gold or cryptocurrencies
- Address volatility and regulatory concerns

Stablecoins

- Top stablecoins by market cap are Tether (\$68.5 billion), Circle's USD Coin (\$33.2 billion), and Binance USD (\$13.2 billion). –a)
- To date stablecoins primarily used to trade in and out of cryptocurrencies.
- Need use cases where they are compelling superior to the alternatives.
- Digital wallet and system interoperability will improve prospects
- Diem (originally Facebook's Libra) announced in 2019
- In the US dollar-backed Diem stablecoins will be issued by Silvergate Bank
- Facebook's wallet Novi and other wallets will support Diem. With ~ 3.5 billion daily active users globally, Facebook's platforms offers a path to building network critical mass.
- Chase's and Signature Bank's dollar-backed tokens JPMCoin and Signet, respectively, support instant payments between their business clients

Stablecoins

- Congress establishing a clear, technology-agnostic, legal and regulatory framework and space for banks and licensed and comparably regulated fintechs, necessary, and would foster payments and money innovation
- Crypto-enthusiast Senator Cynthia Lummis contends stablecoins “should only be issued by depository institutions or through money-market funds or similar vehicles,” and “must be 100% backed by cash and cash equivalents, and this should be audited regularly.”
- Banks could issue and innovate in competing retail and wholesale dollar stablecoins, as they issued banknotes

Central bank digital currencies

- The first CBDC – a digital dollar, launched in 2014 by Ecuador’s central bank, failed.
- Facebook’s 2019 Libra announcement and China’s digital yuan accelerated interest in CBDCs
- More than 80 central banks worldwide have launched, are piloting, or are actively studying CBDCs.
- Bahama’s digital “sand dollar” went live in October, 2020.
 - Nine approved financial institutions including banks, payments institutions, and credit unions.
 - \$273,000 sand dollars issued as of August 31, 2021 ^{–a)}
 - Tech partner is NZIA
- Ripple will support Bhutan central bank’s CBDC pilot with a private XRP ledger

(a- 9/27/2021 remarks by Cleopatra Davis, Banking Manager, Central Bank of Bahamas at Chicago Fed Payments Symposium

Central bank digital currencies

- The PBOC is piloting a digital yuan in 10 cities.
- The Fed, ECB, Bank of England, and Bank of Japan are studying CBDCs. The Boston Fed's running a CBDC experiment with MIT. The Bank of Japan plans to pilot a CBDC in 2022

CBDCs

- While a Fed or bank of England CBDC like would have more privacy protections than the digital yuan, no CBDC will be anonymous like cash
- BIS contends:
 - “the most promising design is an account-based CBDC, rooted in an efficient digital identify scheme for users.” ^{-a)}
 - best designed “as part of a two-tier system where the central bank and the private sector focus on what they do best: the central bank on operating the core of the system by ensuring sound money, liquidity and overall security; the private sector by innovating and using its creativity and ingenuity to serve customers better.”
 - most operational tasks and consumer-facing activities should be delegated to commercial banks and non-bank payment service providers.
 - the two-tier system should be preserved and central banks keep their financial system footprint small, just as cash does today.”

Digital currency clearing houses

- As payment networks connected realtime with banks worldwide Mastercard and Visa would be logical clearing houses for stablecoins and CBDCs.
- Visa has issued a white paper discussing providing a global interoperability platform for digital currencies.
- Though less likely, banks' global cross-border payment-message system Swift too could leverage its network to clear stablecoins and CBDCs

The Fed

- Chairman Jay Powell has remained neutral and said a retail Fed digital dollar would require Congressional authorization.
- Vice Chair for Supervision Randal Quarles and Governor Waller have been skeptical about the need for a Fed retail digital dollar
- Governor Lael Brainard has been a vocal proponent of a Fed digital dollar. Advocates of a retail Fed e-dollar recite the litany it's necessary for financial inclusion and to respond to China's e-yuan. While there may be benefits to a digital Federal Reserve note, neither of these arguments bears scrutiny.
- Advocate Brainard contends a Fed e-dollar will spur private-sector innovation. The danger is it will do quite the opposite. Most banks and fintechs aren't keen to compete with the financial system's paramount regulator and central bank, enjoying near unlimited resources.

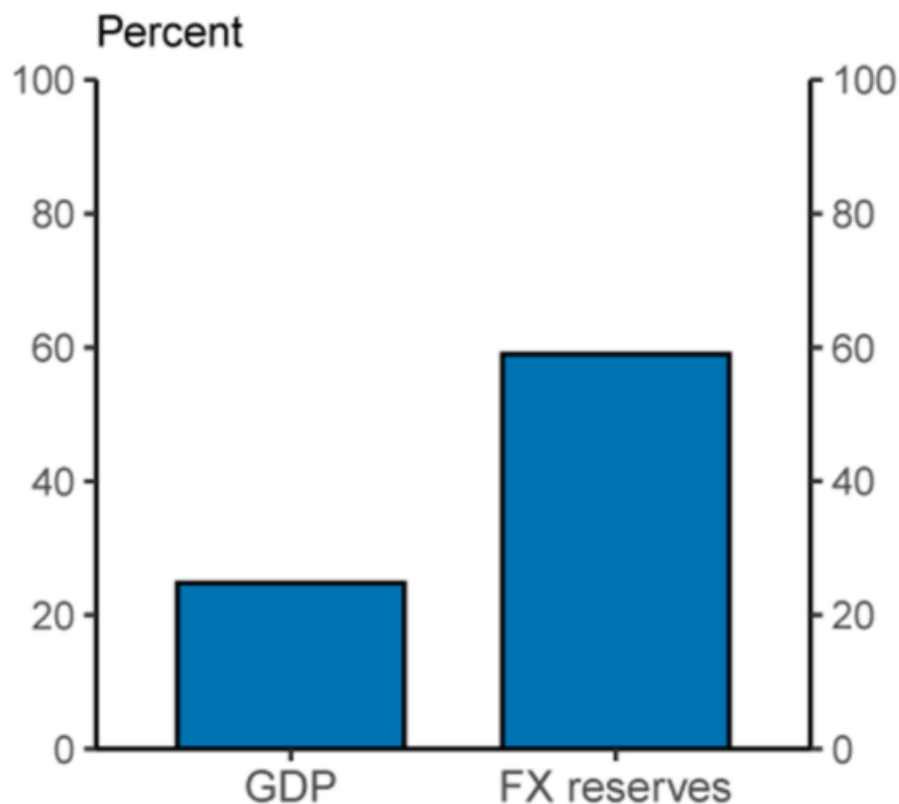
The Fed

- Vanderbilt law professor Morgan Ricks and leading congressional progressives champion direct Fed retail banking (“FedAccounts”).
- In contrast, former CFTC Chairman Chris Giancarlo advocates a DLT-based Fed CBDC, distributed through banks.
- Both CBDC models, to different degrees, would threaten commercial banks.
- If consumers and businesses can hold and transact in notionally risk-free central-bank instead of commercial-bank money, some will, diminishing banks’ lending base.

King Dollar

- The global financial system is dollar-anchored.
- A \$100 bill enjoys worldwide acceptance.
- Private and public digital dollars would bolster King Dollar, particularly in consumer cross-border payments and supplanting weak national currencies and payment systems.
- If Venezuelans could transact from mobile phones in Citi dollar stablecoins or Fed e-dollars, many would.

U.S. share of world GDP versus U.S. dollar share international reserves



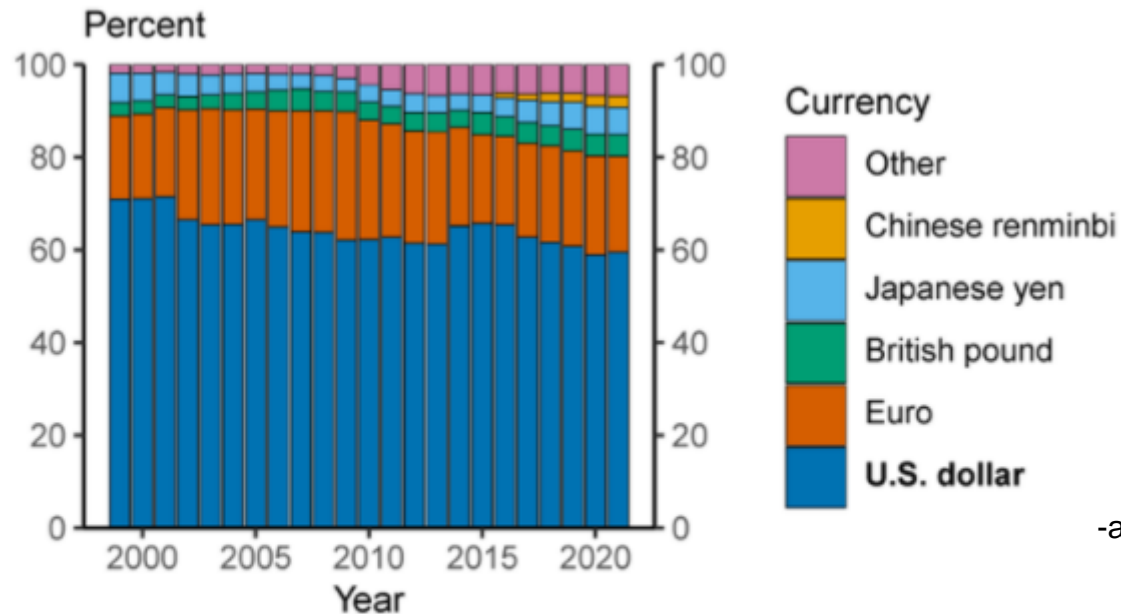
Note: U.S. share of 2020 nominal world GDP compared to the dollar's share of globally disclosed foreign exchange reserves in 2020-Q4. At current exchange rates.

Source: IMF COFER; IMF World Economic Outlook database.

-a)

(a- Carol Bertaut, Bastian von Beschwitz and Stephanie Curcuru, "The International Role of the Dollar," Federal Reserve, October 6, 2021

Foreign exchange reserves



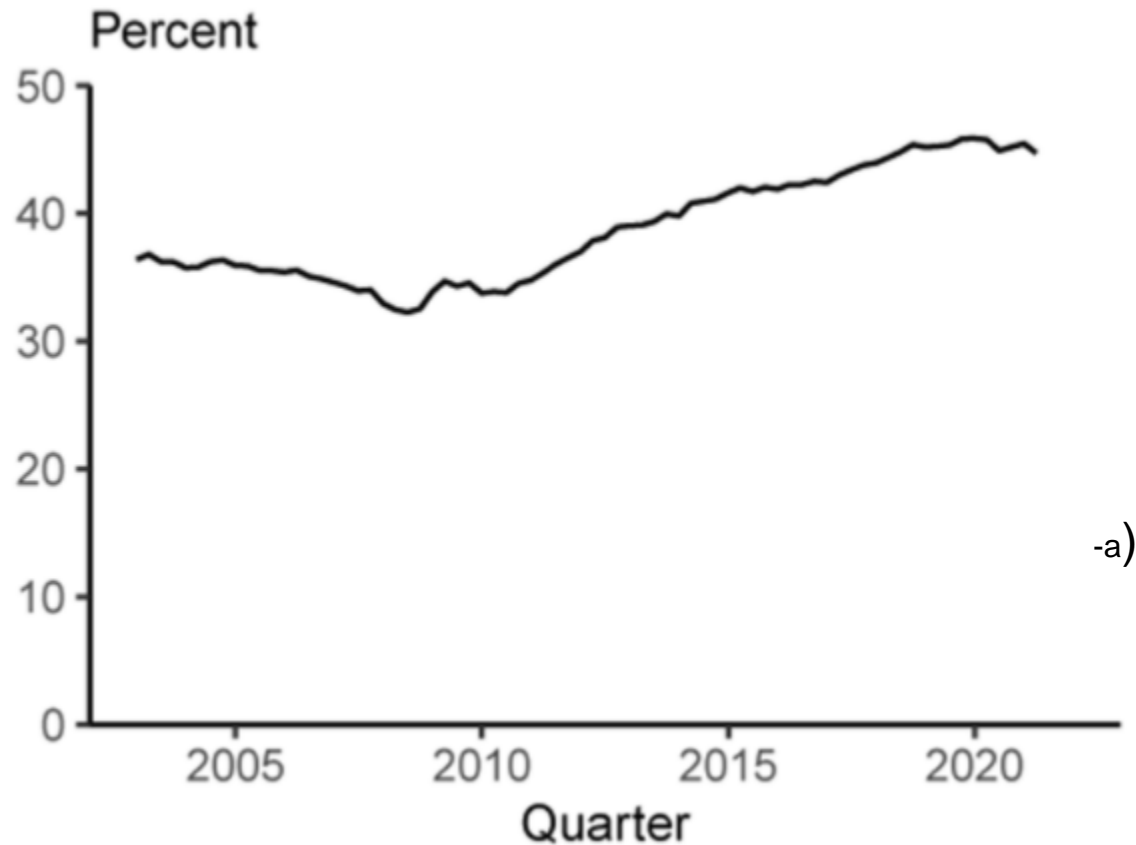
-a)

Note: Share of globally disclosed foreign exchange reserves. At current exchange rates. Data are annual and extend from 1999 through 2021. 2021 is 2021-Q1. Legend entries appear in graph order from top to bottom. Chinese renminbi is 0 until 2015-Q2.

Source: IMF COFER.

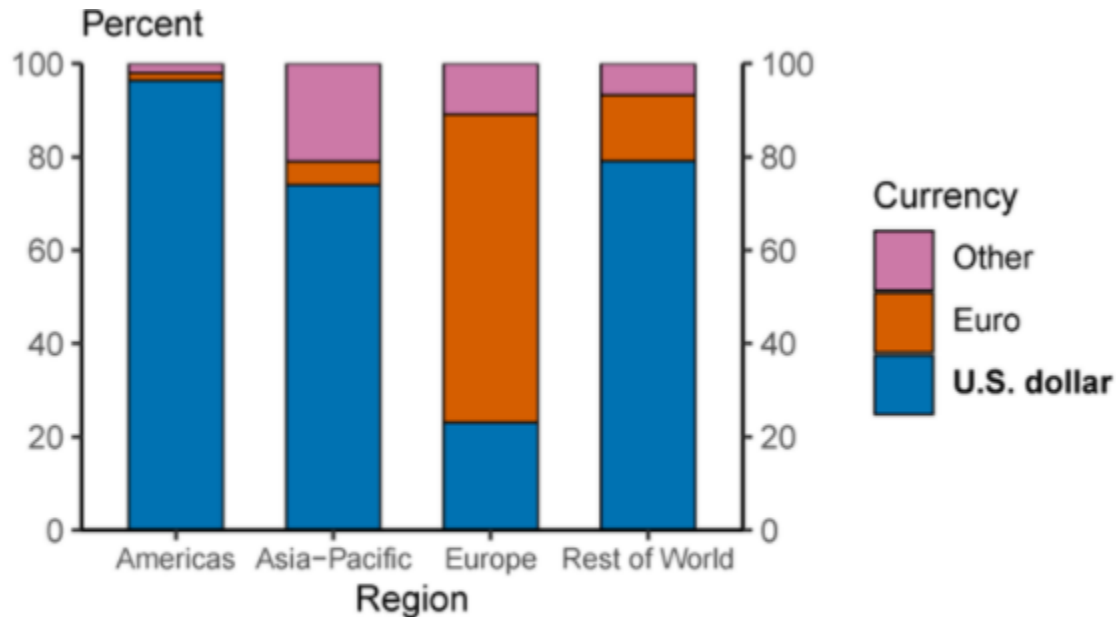
(a- Carol Bertaut, Bastian von Beschwitz and Stephanie Curcuru, "The International Role of the Dollar," Federal Reserve, October 6, 2021

Foreign holdings of U.S. Federal Reserve Notes



(a- This is an estimate, likely low. Carol Bertaut, Bastian von Beschwitz and Stephanie Curcuru, "The International Role of the Dollar," Federal Reserve, October 6, 2021

Share of export invoicing



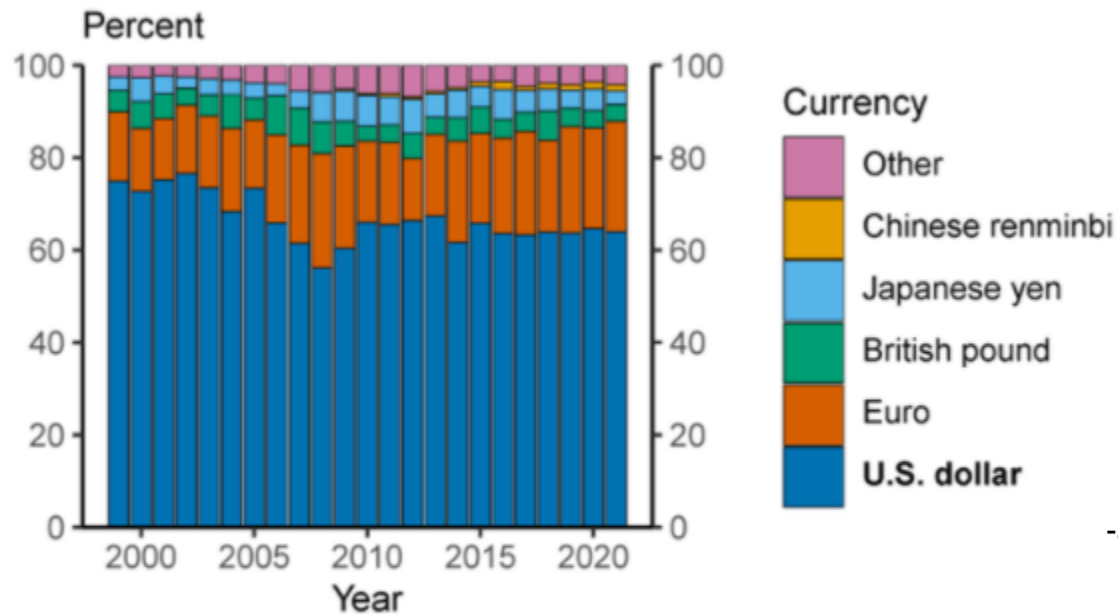
-a)

Note: Average annual currency composition of export invoicing, where data are available. Data extend from 1999 through 2019. Regions are those defined by the IMF. Legend entries appear in graph order from top to bottom.

Source: IMF Direction of Trade; Central Bank of the Republic of China; Boz et al. (2020); Board staff calculations.

(a- Carol Bertaut, Bastian von Beschwitz and Stephanie Curcuru, "The International Role of the Dollar," Federal Reserve, October 6, 2021

Share foreign-currency debt issuance



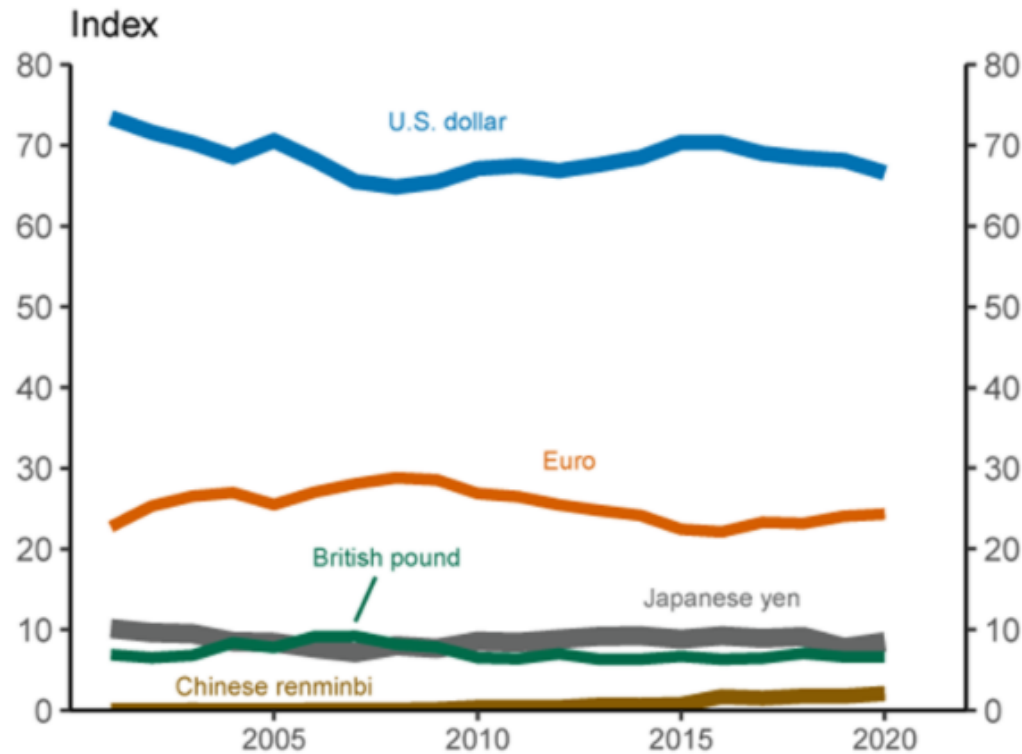
-a)

Note: Foreign currency debt is denominated in a foreign currency relative to the country of the issuing firm (not the location of issuance). At current exchange rates. Data are annual and extend from 1999 through 2021. 2021 is 2021-H1. Legend entries appear in graph order from top to bottom. Chinese renminbi is 0 until 2008.

Source: Dealogic; Refinitiv; Board staff calculations.

(a- Carol Bertaut, Bastian von Beschwitz and Stephanie Curcuru, “The International Role of the Dollar,” Federal Reserve, October 6, 2021

Index of foreign currency usage



Note: Index is a weighted average of each currency's share of globally disclosed FX reserves (25 percent weight), FX transaction volume (25 percent), foreign currency debt issuance (25 percent), foreign currency and international banking claims (12.5 percent), and foreign currency and international banking liabilities (12.5 percent).

Source: IMF COFER; BIS Triennial Central Bank Survey of FX and OTC Derivatives Market; Dealogic; Refinitiv; BIS locational banking statistics; Board staff calculations.

a)

(a- Carol Bertaut, Bastian von Beschwitz and Stephanie Curcuru, "The International Role of the Dollar," Federal Reserve, October 6, 2021

King Dollar

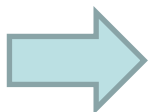
- Continued debasement is a risk to King Dollar. Near-term, however, there's no viable alternative, not fiat currencies like the euro and yuan, and not cryptocurrencies.

Hayek

- F.A. Hayek in Denationalisation of Money: The Argument Refined: An Analysis of the Theory and Practice of Concurrent Currencies argued for free trade in money, for private and national currencies to be able to freely compete, subject to market discipline.
- Pockets of Hayekian currency competition may emerge.

Outlook

- National fiat currencies aren't going away
- Cash will endure
- There's space for private digital currencies. The greater, the better.
- Electronic payment systems based on commercial-bank money, perhaps also supporting CBDCs, will remain major payment systems in Americans' quotidian lives
- Many central banks will issue CBDCs
- Private and public digital currencies will strengthen the strong.
- Cryptocurrencies will see pockets of payments use. They are not, however, likely to become leading global currencies and payment systems.



Private and public money and payments will continue to coexist, compete, and interoperate.