Digital asset regulation

Digital Assets - Week 8 (Lecture)

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Disclaimer 3: Cryptoasset transactions are illegal in some jurisdictions. Do not violate these or any other laws. I am not promoting the use of crypto in countries where it is illegal in any form and these slides are not a promotion of crypto or an invitation to participate in crypto-related activities in such countries. They are purely for educational purposes.

Disclaimer 4: I currently am an advisor to Chainlink Labs.

Outline

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Efficiency concerns

Stablecoin risks

Stablecoin risks

The collapse and de-peg of certain stablecoins since the outbreak of the crypto-asset market turmoil in 2022 highlights the potential fragility of stablecoins that are not adequately designed and regulated. Stablecoins also present concerns related to financial integrity, illicit finance, data privacy, cyber-security, consumer and investor protections, market integrity, fiscal stability, and macroeconomic stability

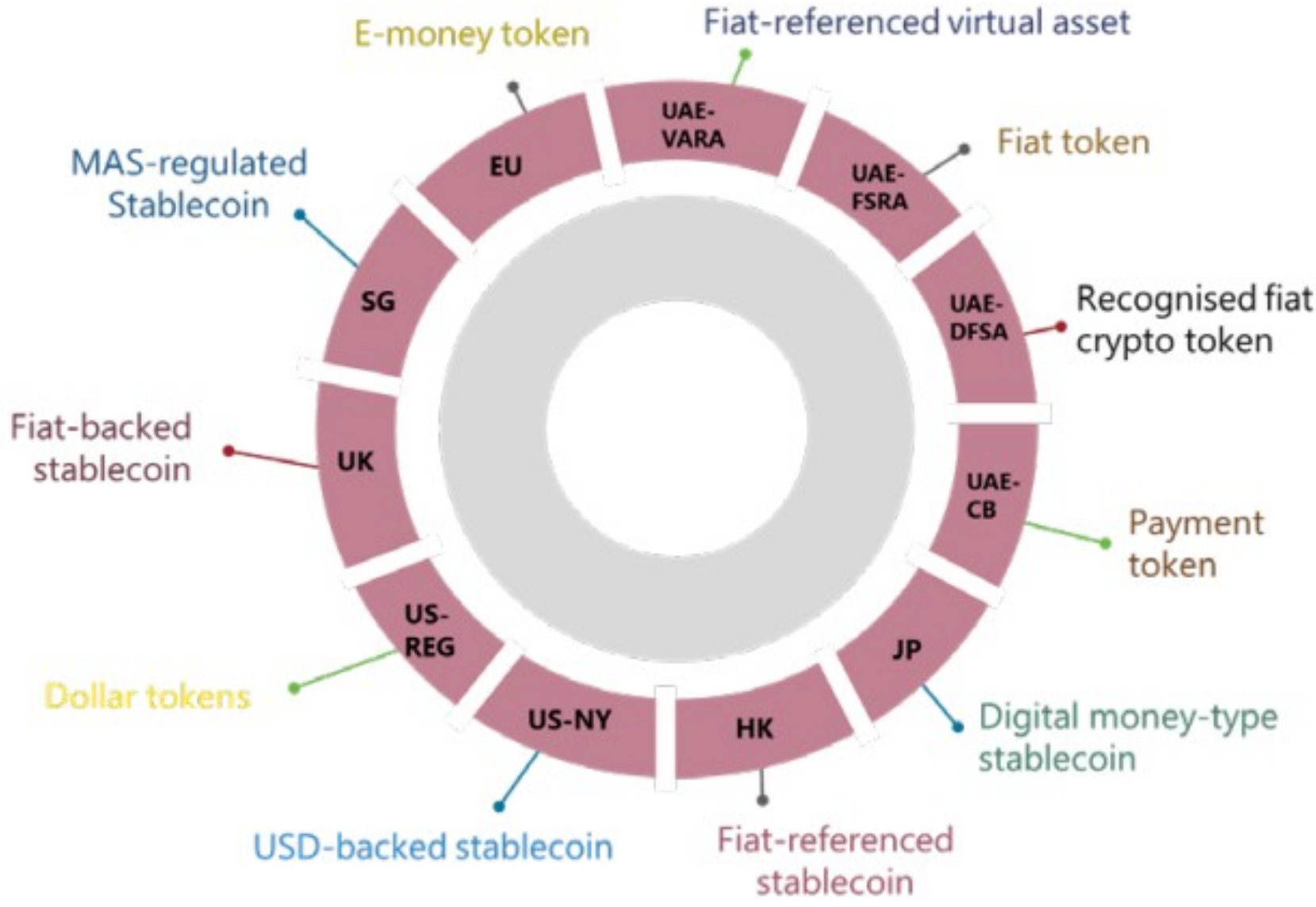
- Cross-border and regulator supervisory issues of global stablecoin arrangements in EMDEs, FSB, 2024

Stablecoin risks

- Stablecoins have the potential to become systemically important, underpinning large volumes of transactions
  - Stability is key to their attraction - and their safety
  - May spur innovation that bank-rails have so far not provided
  - Possibly a welfare-enhancing option to add to existing payment and financial rails
- Despite this, regulators are very suspicious
  - Many have failed and depegged dramatically, been involved in exploits/hacks, lack an operational track record (smart contract bugs, optimized business model, careful audit)
  - Terra-Luna collapse is still a vivid memory
  - Algorithmic stables are beyond the pale in the eyes of essentially all regulators (may be banned, or simply ignored by licensing regulations)
- They also provide - perhaps - scope for money laundering and illicit finance *at scale*

Global coordination

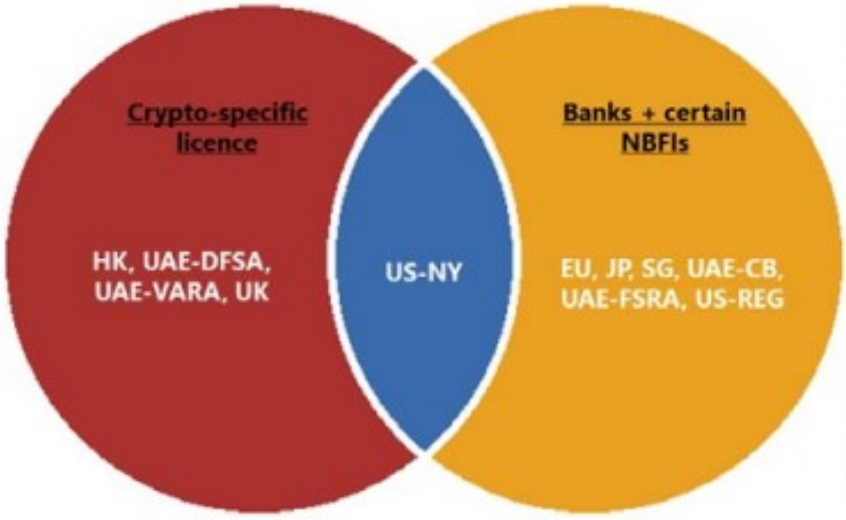
- Their international nature raises problems of coordination as existing regulatory treatment is inconsistent (marketing, segregation of assets, custody, holders' rights, risk management, redemption, KYC/AML...)
- Global coordination is difficult, especially when related to rapidly developing status of crypto technology, use cases for digital assets and novel forms of money
- Even agreeing on terminology and definitions is difficult...



Variation in terminology across jurisdictions. *Source:* BIS, 2024

Global coordination

- CPMI-IOSCO recommendations/principles
  - Well known 'Principles for Financial Market Infrastructures' (PFMIs) have guided trad-fi payments and financial market regulation for many years
  - Have attempted to reinterpret same underlying principles for stablecoins
  - Also have issued broader guidance on general crypto markets and activities
- FSB issued global regulatory framework for cryptoasset activities
  - High-level recommendations - to be fleshed out in implementation
  - Significant attention paid to 'global stablecoin arrangements'
  - Informed by IOSCO
- Bank for International Settlements have also played a key role through pilots
  - CBDC pilots have been expanded to tokenization/digital asset ecosystems
  - Also exploring integration with legacy reserves/RTGS systems and instant payments



Jurisdiction	Licence type
EU	Credit institution or electronic money institution/ELMI
HK	Fiat-referenced stablecoin (FRS) licence
JP	Bank, fund transfer service provider or trust company
SG	Bank or "Major Payment Institution licence"
UAE-CB	Bank or "Payment Service Provider licence"
UAE-DFSA	Recognised fiat crypto token
UAE-FSRA	"Financial Services Permission" (FSP) for providing money services
UAE-VARA	Licence Category 1 – "VA issuance"
UK	A new regulated activity will be created under the Regulated Activities Order (RAO) for SC issuance.
US-NY	Licence to engage in virtual currency business activity – "BitLicense" or "Limited Purpose Trust Company Charter"
US-REG	National banks, state member banks, and all insured depository institutions

Licensing variation across jurisdictions. *Source:* BIS, 2024

I. Common types of reserve assets (examples)	Jurisdictions
a. Cash or cash equivalents (including, but not limited to, central bank reserve deposits and bank deposits)	EU, JP, SG, UAE-FSRA, UAE-VARA, UK, US-NY[1]
b. Assets with minimal market risk, credit risk and concentration risk, which are capable of being liquidated rapidly with minimal adverse price effect (**"liquid" assets**)	EU; HK; SG; UAE-CB, UAE-DFSA, UAE-VARA[2]
II. Types of "liquid" assets (examples)	**Jurisdictions**
a. Debt securities issued by governments or central banks of the stablecoin reference currency	SG; UAE-VARA; US-NY; UK[3]
b. Debt securities issued by government agencies (local or international)	SG, UAE-VARA[4]
c. Repurchase agreements	UAE-VARA[5]
d. Short-term government money market funds (MMFs)	UAE-VARA; US-NY[6]
III. Valuation and attestation of reserve assets (examples)	**Jurisdictions**
a. Market value of the reserve should be at least equal to the nominal value of all outstanding units of the stablecoin	HK, SG, UAE-DFSA, US-NY
b. Issuers should engage an independent third party to examine and attest to the value, composition and sufficiency of reserve assets	Monthly (HK, SG, UAE-VARA, US-NY), biannual (UAE-CB), annual (UAE-DFSA)

[1] **EU**: min 30%. **US-NY**: composed by deposits at US state or federally chartered depository institutions, with specific limitations set by the New York Department of Financial Services (NYDFS).

[2] **EU**: max 70%.

[3] **US-NY**: residual maturity of 90 days or less. **UK**: maturity one year or less; use of MMFs is not allowed when investing in treasury bills to back stablecoin.

[4] **UAE-VARA**: maturity of 90 days or less. **SG**: debt securities should be issued by organisations that are of both a governmental and international character with a credit rating of at least AA–.

[5] **UAE-VARA**: maturity of seven days or less which are backed by debt securities issued by governments or central banks of the stablecoin reference currency. **US-NY**: reverse repurchase agreements should be fully collateralised by US Treasury bills, US Treasury notes and/or US Treasury bonds on an overnight basis, subject to NYDFS-approved requirements concerning overcollateralisation.

[6] **US-NY**: government MMFs, are subject to NYDFS-approved caps on the fraction of reserve assets to be held in such funds and NYDFS-approved restrictions on the funds.

Summary of reserve composition, valuations and attestation requirements.
Source: BIS, 2024

Examples	Jurisdictions
I. Segregated from the proprietary assets of the issuing entity	EU[1], HK, JP, SG, UAE-CB, UAE-DFSA, UAE-FSRA, UAE-VARA, UK, US-NY
II. Segregated in separate accounts	EU[1], HK, SG, UAE-DFSA, UAE-FSRA, UK[2], US-NY
III. Held in custody by authorised banks and NBFIs authorised to hold client assets/provide custodial services	EU, HK, SG, UAE-CB, UAE-DFSA, UAE-FSRA, UAE-VARA, UK, US-GOV, US-NY
IV. May be held by overseas-based custodians, subject to certain restrictions	SG[3], UAE-DFSA[4]
V. Not pledged, encumbered or rehypothecated	UAE-CB, UAE-FSRA, UAE-VARA
VI. Kept segregated reserve of assets per each stablecoin issued	UAE-CB, UAE-VARA, UK

[1] Issuers should deposit at least 30% of the funds received in separate accounts in credit institutions.

[2] Segregation by statutory trust.

[3] Overseas-based custodians, with minimum credit rating of A–, which have a branch in Singapore regulated by MAS.

[4] Allowed, subject that custodians are located in jurisdictions with regulation that is equivalent to the Dubai Financial Service Authority's regime and AML regulation that is equivalent to the standards set out in the FATF Recommendations.

Summary of segregation and custody requirements. *Source:* BIS, 2024

Examples	Jurisdictions
I. Issuers should ensure holders the right to redeem their stablecoins	EU, HK, JP, SG, UAE-CB, UAE-DFSA, UAE-FSRA, UAE-VARA, UK, US-NY
II. Timely redemption:	
a. General requirement	EU, HK, UAE-CB,
b. Specific number of business days (bd)	UK, UAE-FSRA, UAE-VARA, (1 bd) US-NY (2 bd) SG (5 bd)
III. Redemption must be ensured at par value	EU, HK, SG, JP, UAE-VARA, UK, US-NY
IV. Redemption shall not be subject to a fee	EU, UAE-VARA
V. Clear and detailed redemption policies and procedures shall be implemented and disclosed	EU, HK, JP, SG, UAE-CB, UAE-DFSA, UAE-VARA, UK, US-NY

Summary of redemption rights. *Source:* BIS, 2024

Capital requirements?

- Stablecoins are (essentially) narrow banks
  - Here I am referring to fiat-backed stablecoins (not DAI etc.)
- Rather than holding loans and other exotic assets, they hold Gilts, Treasuries, bank deposits
  - Regulators (reasonably) believe that the ability of a stablecoins' to convert reliably, on demand, to fiat at par requires that reserves are held in HQLA and/or reserves (or a CBDC?)
  - Some people (see the BoE systemic stablecoin consultation) suggest they should be fully backed with CB reserves
- The incentive to earn higher returns on backing assets likely expose the coin to substantial risk (duration mismatch, credit, counterparty)
  - These types of risk are familiar from tradfi - hence regulation should be expected

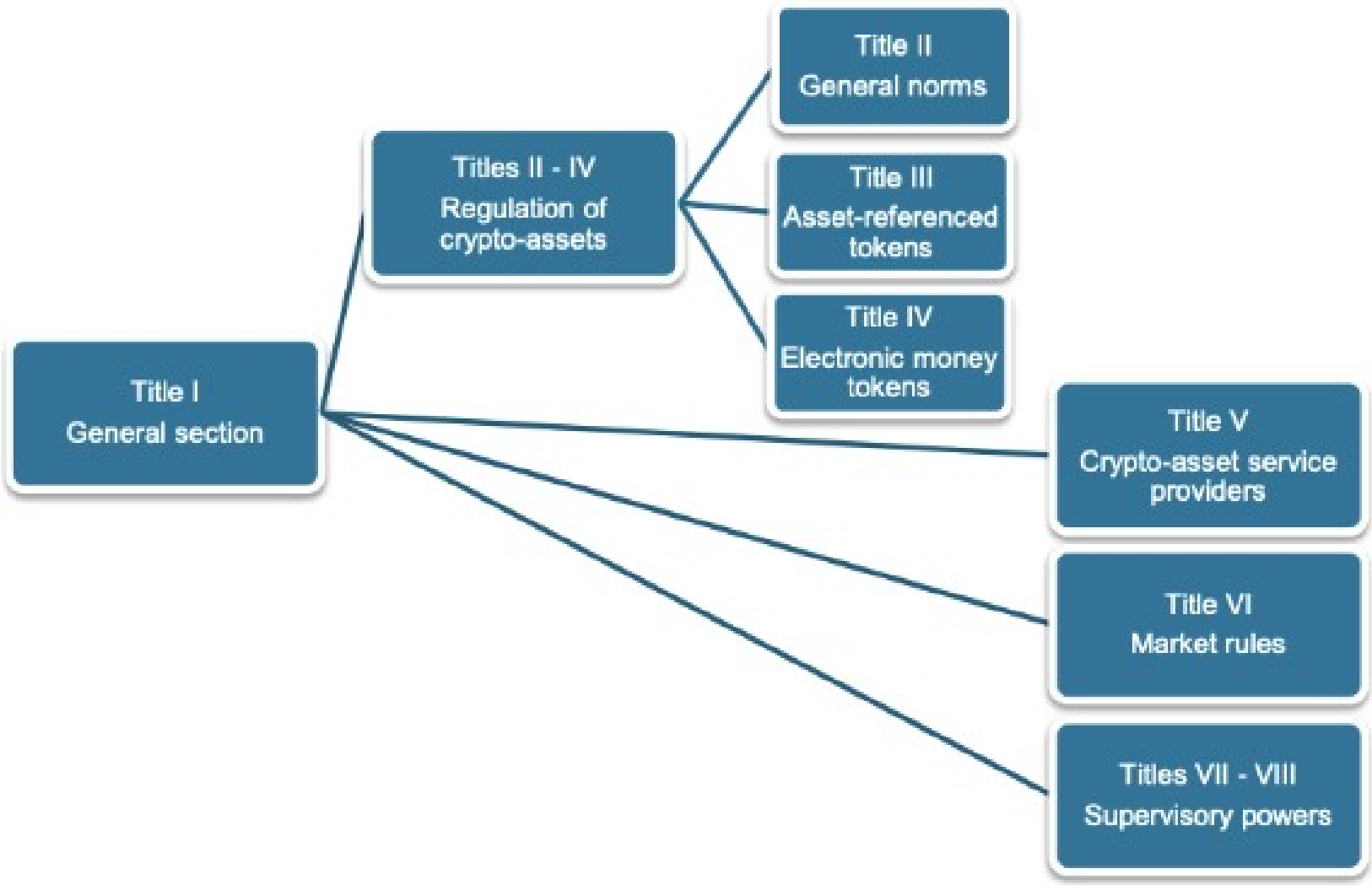
Capital requirements?

- Do they need capital requirements?
  - If reserve backed, conceptually they are almost riskless (though still operational risks)
  - If Treasury/Gilt backed then still perhaps problematic if marked to market (relevant if need to liquidate - possibly risking firesales)
  - MiCA: max(€350k or 2% of reserve assets) andassets must be segregated, bankruptcy remote, and held by a custodian distinct from the issuer
  - UAE-VARA: AED 600k plus 2%
- Distinguishing different types of stablecoin issuers
  - Stringency may also vary based on significance (MiCA) and/or systemic nature (UK)
  - Significance relates to size of client base, value of token issued, number and value of transactions...

MiCA

MiCA

- The Markets in Crypto-Assets Act or (MiCA) is a flagship regulatory framework in the EU
  - Ratified in May 2023, and currently being phased in
  - Intended to be a unifying framework across the EU
- Applies to:
  - Custodial wallets (e.g. offered by Binance), exchanges/trading platforms, crypto advisers/portfolio managers
  - E-money tokens, Asset-referenced tokens, 'other tokens' (notably Bitcoin, Ethereum, utility tokens,. . . see one - not necessarily fully accurate - classification here)
  - NFTs that are sufficiently similar to the aforementioned tokens
- Lays out obligations and restrictions for Crypto-Asset Service Providers (CASPs), issuance of tokens, and limitations on the operation of, in particular, stablecoins



MiCA's nine titles structure *Source:* CoinTelegraph/CMS.law, Oct 10, 2024

MiCA: Not about DeFi

- MiCA is not designed to apply to 'fully decentralized' apps/smart contracts
  - See here for an attempt at the - difficult - issues of definition
- Does not cover non-custodial and 'unhosted' (e.g. Ledger) wallets
  - Difficult issues arise if wallet does more than simply store keys
  - Subtleties around additional services - eg. enabling trading
  - Eg. I couldn't find a clear answer on MetaMask...
- Seems focused on somewhat intermediated activities/role of third parties, rather than *true* defi and P2P activities

MiCA: Digital money

MiCA distinguishes two types of digital money (essentially 'stablecoins')

- *E-money tokens:* Stabilize their value with respect to a single official currency (e.g. EURC)
- *Asset-referenced tokens:* Stabilize with respect to multiple assets (e.g. basket of currencies/commodities) or other crypto

Prior to the phasing in of MiCA various services (e.g. exchanges) stopped accommodating or listing some prominent stablecoins

- Anticipating that they would not satisfy MiCA requirements
- *Example:* Coinbase delisted Tether's USDT - though note that it can still be used heavily on AMMs (not under MiCA)

MiCA: EMTs

- Issued by authorized e-money institutions (EMIs) and credit institutions (CIs)
- Holders have a direct claim against the issuers for redemption at any time and at par value
- No redemption fee charges
- Regulated by EBA
- EMTs are ‘e-money’ and thus, ‘funds’ $\Rightarrow$ can be used as a means of payment

MiCA: ARTs

- Regarded as a medium of exchange but not ‘funds’ (unlike EMTs)
- Right of redemption at all times against the issuers in fiat equivalent to the market value of the assets referenced, or the actual delivery of the referenced asset
  - i.e. not necessarily at par value - though an EMT presumably can attempt to maintain par...
- For ‘significant’ ARTs, additional requirements are imposed (EBA regulation, for example, rather than ESMA)

MiCA: EMT/ARTs white paper (and marketing)

- Issuer must provide a 'white paper' to inform investors (see USDC and EURC examples)
- Information regarding the reserve assets, number of tokens in circulation, and fees must be regularly reported
- In addition, there are restrictions on marketing
  - Should be clearly flagged as such, and not misleading
  - See here for Circle's documentation of its marketing activities

MiCA: EMT/ARTs white paper

- The white paper is supposed to be a clear (not misleading) guide to the ART, to allow an investor to make an informed decision
  - Issuer information
  - Details about the ART
  - The offering to the public or admission to trading
  - Underlying technology
  - Risks
  - Reserves
  - Environmental impact of consensus mechanisms
  - Consumer protection declarations

MiCA: Licensing

- For EMTs: Incorporate and obtain license within an EU member state as Electronic Money Institution (EMI) or Credit Institution (CI)
- For ARTs: Legal persons or undertakings established within the European Union and authorised by their competent authorities
  - Or a CI
- Crypto Asset Service Providers (CASPs)
  - Companies that help users control, trade or store their crypto-assets

MiCA: Licensing

- Can obtain license in one EU country and 'passport' into the rest of the area
  - Quantoz Payments (EURD) is licensed as EMI in Netherlands and has recently partnered with Tether (and others), perhaps suggesting a route for Tether to obtain MiCA compliance
  - Confusingly, ESMA has 'declined to disclose' whether USDT is currently compliant!

MiCA: Licensing

- Some examples:
  - Circle (EURC, USDC) and SG Forge CoinVertible (EURCV) both licensed in France as EMIs
  - Monerium (EURe) licensed as EMI in Iceland
  - Banking Circle (EURI) licensed as CI in Luxembourg
  - Blockchain.com (CASP - wallet provider) licensed in Luxembourg
  - Bitpanda (CASP - exchange) licensed in Austria
  - Netherland Bank register of CASPs

Some criticisms of MiCA: Interaction with tradfi

- MiCA ⇒ 'significant' stablecoin issuers hold ≥ 60% of their reserves as deposits with multiple (though fewer if 'large') commercial banks
  - Complex and arguably worsens 'Too big to fail' (or 'Too interconnected to fail')
  - Awkward tension between institutions that are in some sense competitors as providers of digital money (deposits and tokenized deposits vs stablecoins)
  - Confuses the backing assets of stablecoins by connecting it to fractionally backed deposits
  - Recall that USDC depegged partly because of problems originating in the *traditional* banking system
- Seems a strange approach in the long run **but** in the short run some justification?
  - Can piggy-back on existing licensing regimes
  - Keeps stablecoins within a somewhat familiar perimeter, where familiar tools/levers can be employed
  - Are regulators and legislators captured by the banking lobby?!

Some criticisms of MiCA: Onerous restrictions on scaling

- MiCA imposes trading limits on significant stablecoins (and will be EBA regulated rather than ESMA)
- Caps on transaction values of ARTs and non-€ EMTs
- Motivated by concern that European money might be usurped as 'means of exchange' in relation to goods and services
- For large stablecoins (USDC etc.) this essentially implies they need to stop issuing new tokens
- Their transaction rates and holdings are huge, relative to caps

Sandboxes

Sandboxes

- Regulatory sandboxes have become fashionable in allowing supervised development and innovation
- They vary across jurisdictions but the main aims are:
  - Controlled environment
  - Relaxes/derogate from some laws and regulations to allow a 'live' environment that otherwise might incur regulatory or legislative obstacles
  - Directs focus to areas of regulators' priority
  - Enable communication and rapid feedback
  - Signals promising development path to firms' investors
  - Avoid regulatory surprises
- Especially useful for innovative technologies and concepts
  - Not only used in digital assets (see OFGEM)
- An alternative to 'pilots'
  - Also useful (see the many BIS CBDC and payment pilots) but less about explicit partnership

Sandboxes - A few examples

- EU's DLT Pilot Regime
- HK: Project Ensemble sandbox for tokenization, and the stablecoin issuer sandbox
- UAE's ADGM RegLab
- UK's Digital Securities Sandbox for FMI
  - Interesting analyses of other UK sandbox experiences here

Sandboxes - A few examples

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UK: DSS

The DSS is a regulated live environment that has been created to explore how developing technologies could be used by firms to undertake the activities of notary, maintenance and settlement for financial securities either alone, or together with the operation of a trading venue. For example, the DSS will facilitate the issuance, trading and settlement of digital securities in the UK on distributed, programmable ledgers. These activities will need to comply with regulation by the FCA and the Bank.

- What is the Digital Securities Sandbox?, Bank of England

UK: DSS

- Accompanied by a bespoke set of rules
- Designed for issuing, trading and settling 'real digital securities' (whatever that means)
- They seem to mean traditional securities/derivatives/funds - not stablecoins and certainly not Bitcoin, Ether etc.
- Nice analysis from Freshfields here

Envisage progress through DSS *Source:* Bank of England, April 2024

HK: SIS

- Launched in March 2024
- Participants include Standard Chartered, Jingdong Coinlink Technology, RD InnoTech, Animoca Brands, and HKT
- Encouraged used cases:
  - payments
  - supply chain management
  - applications in capital markets
- Part of a broader push in HK (see here)

HK: SIS

A key consideration is the need to propose concrete use cases for the stablecoin to help address pain points in economic activities and create value and new opportunities for our economy and financial services. An applicant is also expected to explain how its network, supply chain or major partners can drive the long-term, sustainable demand for the stablecoin it issues. There should also be specific plans on using the sandbox to demonstrate the robust processes to be put in place for the issuance, distribution and redemption of the stablecoin, in full compliance with the future regulatory requirements such as the management and safekeeping of the reserve assets, risk mitigation measures for credit, liquidity, technology, operational and money laundering / terrorist financing risks, etc.

- HKMA, July 18 2024

EU: DLT Pilot regime

- Somewhat like UK's DSS (though pre-dated it) in that it is focused on FMI
- Encourages experimentation in DLT market infrastructure (nice analysis here)
- But nobody is operating in it (and only a few applications)!
- Has been heavily criticised for:
  - Complexity
  - Ambiguous interaction w. other regulations (MiFID II, MiCA)
  - Onerous limits and restrictions that make it unattractive

EU: DLT Pilot regime

- Interestingly, ESMA has offered its own (constructive) criticisms in a letter to the European Commission
  - Poor coordination with MiCA (timing and scope) - hindering use of EMT for settlement, and in treatment of self-hosted wallets
  - Volume limits disincentivized larger players
  - Difficulties of enabling interoperability with DLT settlement systems as none have yet been approved
  - Hot competition with other jurisdictions' sandboxes

AML/KYC

AML/KYC

- AML/KYC is frequently regarded as being in tension with the pseudonymity and other privacy-enhancing technologies found in much of crypto
  - See earlier weeks' lectures/pre-records
- Various countries (e.g. FCA in UK) have been influenced by the FATF 'travel rule'
  - Attempt to harmonize practices for crypto assets businesses across jurisdictions
  - Aligns regulatory approach with those typical for sending and receiving transactions in TradFi
  - Institutions (e.g. CASPs in MiCA) must gather tx info and share them with institutions in other jurisdictions
  - Particularly important to share information on beneficiary and originator (for AML/KYC and Counter Terrorist Financing)

AML/KYC

- In traditional finance, various information is already collected and transferred with (wire) transactions:
  - *Originator info:* name, address, account and national ID
  - *Beneficiary info:* name, account number
  - Also required to keep records, and have compliance systems
- CASPs and 'centralized' crypto institutions (e.g. large exchanges) can be put under pressure to conform
  - No compliance ⇒ no license
  - But none of this is required in defi / public blockchains
- Note that this could lead to privacy violations and risks
  - Though typically imposed only on transactions above a particular threshold

AML/KYC

- *Example:* Before conveying assets to beneficiaries, CASPs (in Europe) will have to verify
  - source of asset not subject to restrictive measures or sanctions
  - no risks of money laundering or terrorism financing
  - recall our discussion of whitelists/blacklists when discussing regulation-friendly token standards (e.g. T-REX)
- This is partly why one must identify oneself on setting up accounts on centralized exchanges
  - Clear privacy issues - could this one day be solved with digital ID and zkProofs?

FATF criteria for Virtual Asset Service Providers *Source:* CoinTelegraph, 2024

Digital currency risks for emerging economies

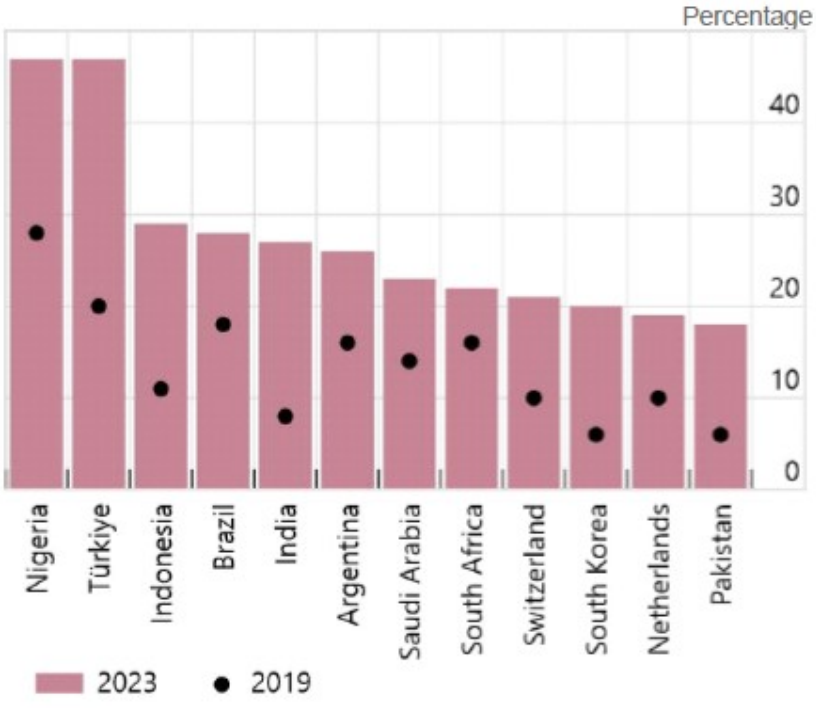
Digital currency risks for emerging economies

- Stablecoin usage appears to be relatively high in emerging economies
  - Possibly reflects troubled monetary policy experience
  - Limited access to banks, but high rate of smartphones
  - Younger populations
  - Long-running desire to access $ denominated assets
  - High fees and slow execution of traditional remittances

Global Crypto-assets Adoption Index as of 2023* (Chainalysis)

Country	FSB/RCG Member	Chainalysis Overall index ranking
India	FSB	1
Nigeria	RCG	2
Vietnam	RCG	3
United States	FSB	4
Ukraine	RCG	5
Philippines	RCG	6
Indonesia	FSB	7
Pakistan	RCG	8
Brazil	FSB	9
Thailand	RCG	10

Statista survey: crypto-assets use1



Activity in cryptoassets *Source:* FSB, 2024

Digital currency risks for emerging economies

- Many risks identified in other countries apply in EE also, but there are particular concerns:
  - Digital dollarization and loss of monetary sovereignty
  - Loss of seigniorage and VAT revenue
  - Data and expertize gaps among regulators possibly more severe
  - Possible amplification of volatile financial flows, particularly if digital assets lie outside capital flow restrictions
  - Tendency for operators not to set up HQs in EEs - requiring international communication and cooperation to influence their activities

Efficiency concerns

Efficiency concerns

- Regulators are not only concerned about financial crises or horrific money laundering vulnerabilities
  - They are also concerned about efficiency (market functioning, competitive distortions)
- We will briefly consider two:
  - Fragmented liquidity and singleness of money
  - Competitive distortions and walled gardens

Fragmented liquidity and singleness of money

- Until recently, there have been fairly limited options for payment rails
  - Cash, bank deposits (or e-money systems that layer on top of bank rails) and credit cards
  - RTGS / central bank reserves for much of wholesale finance
- One benefit: people and firms could focus their activities on a small set of payment rails that they could assume everyone else was using
  - With issuance of many novel moneys, possibly circulating on different chains, there is a worry that liquidity will become siloed
  - Concern this will lead to resources being wasted monitoring and transferring across systems / between moneys
  - A lot of research and work is being put into blockchain interoperability (using bridges, oracles etc.), but problem not yet solved

Fragmented liquidity and singleness of money

- Singleness of money is a term typically meant to imply that all assets that operate as money (within an economy) exchange at par, always and everywhere
  - If they didn't, there would be issues of complexity (various exchange rates to keep track of) - especially if the deviations were random and time-varying
  - Unless a run is happening I never think of 100 units of deposits at Santander as different from 100 units of deposits at Nat West, or from 100 units of cash, or 100 units of reserves
  - But they are different!
  - Regulators (and the fact that banks settle with eachother using reserves) keep me assured that I will always be able to transact with these moneys and any transaction - if it settles - will settle at par
  - Our account-based (rather than bearer-instrument based) digital moneys impose 100% singleness of money

Fragmented liquidity and singleness of money

- Do stablecoins, tokenized money market funds offer the same singleness of money?
  - No - we have seen they depeg and vary around $1
  - In some cases can be difficult to redeem (recall USDC problems) though depegging in AMMs etc doesn't necessarily mean a failure of *convertibility*
- Some bugs are still being worked out of the system (smart contracts, redemption efficiency, arbitrage in crypto markets, better regulation/accounting, improved custody of safe backing assets. . .)
  - But even in the long run, may be difficult to keep a bearer instrument (like a stablecoin) trading *perfectly* at par
  - Perhaps possible if a CB provides liquidity facilities?
  - IMO, not a complete disaster for small to medium value transactions

Competitive distortions and walled gardens

- One motivation of DeFi was to disintermediate finance
- Centralized intermediaries had obtained dominant positions that gave them market power and possibly TBTF status/regulatory influence
- There is a concern that some of the same distortions may re-emerge in the case of digital assets
  - As you have seen, it is hard to prevent centralization from emerging (recall the blockchain 'trilemma')
  - *Example:* Even in AMMs, recent research suggests key players may emerge as LPs, almost like traditional dealers
  - Some people are concerned that a tiered system of liquidity provision will re-emerge with creators of important stablecoins becoming akin to correspondent banks
- A big concern is that 'walled gardens' may emerge, with coins associated with particular trading/commercial platforms
  - Even big blocks like the Eurozone are concerned with monetary sovereignty in this case

Walled gardens

There is a risk that new forms of private digital money emerge in a fragmented way, such that they cannot always be easily converted into other types of money. Fragmentation may arise if holders of one form of money can only interact with others using the same system or from the same issuer.

Walled gardens and closed loop systems are closed payment systems in which all operations are controlled by the system operator. For example, an internet platform issuing a certain form of money might impede other firms' ability to provide wallet services for that money. Alternatively, users may not be able to transact with users outside of that specific system.

Convertibility may be costly, complex, or slow between different forms of digital money, even where conversion is possible. And wallet services providers, who act as intermediaries, might also restrict transactions.

- The D£: a new form of money for hholds and businesses?, BoE, Feb 2023

Walled gardens

Digital platforms such as Google, Amazon, or Facebook are the signature business model of the digital economy. They operate as two-sided markets, which entails two key features

First, they intermediate transactions between two groups of agents. Second, a network externality is present: the decisions of each group of agents affect those of the agents on the other side of the platform. For example, sellers will find an online marketplace more attractive if more buyers are present, and vice versa.

Network externalities are a source of market power and thus play a key role for platform pricing and competition. Platforms aim to strengthen network externalities by creating closed ecosystem (so-called "walled gardens") with the aim of locking in one side of the market, which enables them to charge monopoly prices to the other side. In the extreme, this can give rise to a winner-takes-it-all outcome with a single dominant platform in a particular market segment.

- The economics of CBDC, ECB, Feb 2023

Walled gardens - solved by a CBDC?

The Government has identified several characteristics of digital markets that may lead to concentration. Such characteristics include network effects, economies of scale and scope and data advantages, which can act as barriers to entry. This suggests that **the future development of private money issuance could tend towards a small number of firms taking a significant market share.**

Dominant issuers of new forms of private digital money may create 'walled gardens' - payment systems that are not fully interoperable or restrict the development by smaller firms of payment services using the money they issue.

A digital pound issued by the Bank of England would provide an alternative, public, digital money - an open platform, which would be available to all developers of new digital payment services.

- Jon Cunliffe, BoE, Feb 2023

Are regulators helping?

- Regulators face a difficult task in responding to the digital asset revolution and to DeFi
- IMO - they have not (yet) thought hard enough about how the financial system can be re-engineered
- There is a tendency to force digital assets into traditional regulatory and industrial patterns
- This may leave some of the possible 'structural' (rather than administrative) gains from the new technology unexploited
- IMO - too much attention is paid to traditional banks (e.g. in BIS pilots) and not enough to innovative companies, protocols
- The main problems with banks are not that they had inefficient back-office - the main problems were TBTF, competitive distortions, fragility, centralization...
- As AI allows our data to be mined even more - and for us to be manipulated even more - do we want so much centralization

Difficult - but important and interesting - questions

- There are many open questions in this area
- A great time for research and a great time to be involved - in the public, private or academic sector...

Thanks for listening