CODING CAPITAL: THE LEGAL VS. THE DIGITAL CODE

Katharina Pistor

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Key questions

- What is capital?
- Why is capital dependent on law & state power?
- Might the digital code replace the legal code?
- Can the digital code rule without the state?
- Who governs the (legal or digital) code?
- Quo custodiet ipsos custodes (who governs the governors)?
Capital

- Capital is not a thing
  - Yet, a thing (object) can be turned into capital

- It is a legal quality
  - That is grafted on “things”: object, claims, know-how, ideas, data....

- Attributes that turn a simple asset into a capital asset
  - Priority, durability, convertibility, universality

- Legal Toolkit
  - Contract, Property, Collateral, Trust, Corporate, and Bankruptcy law
Capital’s Key Attributes and their Legal Coding

- **Priority**
  - Hierarchy of claims
    - Property, Collateral Law
- **Durability**
  - Extension of priority claims in time through asset shielding devices
    - Trust, Corporate Law, Bankruptcy Safe Harbors
- **Convertibility**
  - Locking in past gains through put options
    - Reserves, Discount Window, Redeemable shares, Share repurchases
- **Universality**
  - Extends priority rights in space through threat of coercion
    - Enforcement of legal rights erga omnes
Capital and Coercion

■ Max Weber:
  - “A ‘legal order’ shall rather be said to exist wherever coercive means, of a physical or psychological kind, are available
  - “Today legal coercion by violence is the monopoly of the state”

■ Capital’s attributes are not self-enforcing

■ Hierarchy and uneven distribution of assets undermines cooperative solutions
  - Decentralized enforcement of law (Hadfield/Weingast)

■ Changing nature of capital assets increases dependence in threat of coercion
  - From “real” assets produce returns without law to assets that exist only in law
    ■ Financial assets
    ■ Intellectual Property Rights
    ■ Trade Secrets for compilations of data & information
Limits of the Legal Code

- Enforceability is not the same as enforcement
  - “Credible commitments” are often honored in their breach
  - Risk of over-reliance on legal titles

- Enforcement may not render returns
  - Debtor may have no assets OR no assets of value
  - Bankruptcy law privileges some creditors over others

- Scope of state power
  - Bounded by territory
  - Extra-territorial reachg
    - “Choice of law” (opt-ins and opt-outs)
    - 1958 NY Arbitration Convention

- Politics
  - Legislative change
  - Constrained by constitutional protections
Features of the Digital Code (Blockchain)

- **Immutability**
  - Tamper-proof; fraud resilient
    - yet fraudulent ICOs (UK’s FCA: 78%)

- **Credible Commitment**
  - Smart contracts are non-negotiable

- **Decentralized verification**
  - No human agency

- **Self-Execution**
  - Pre-payment or access to wallets

- **Innovation/Adaptation to Change**
  - New digital chains/networks
  - Forks from existing ones
Limits of Digital Coding

- Incompleteness
  - Bugs
  - Fundamental (Knightean) uncertainty

- Human agency
  - Off-line for “emergency” fixes
  - Oracles & Arbiters
  - Cold storage of crypto-keys (QuadrigaCX)

- Intersection with the real world
  - Implementation of digital code’s commands
  - Subject to real world’s legal requirements
    - ICOs = securities?

- Ambivalent relation to credit
  - Ex ante verification of means of pay
  - Mehrling: “Cryptos Fear Credit”
Coding Capital

- **Grafting** priority, durability, convertibility and universality on assets
  - Law: Legal Tool Kit (property rights, collateral law....)
  - Digits: digitizing legal claims; allocating claims to digital space

- **Bottom up process**
  - Law: Vindication ex post at enforcement stage
  - Digits: Embedded in code (might be ex ante or ex post)

- **First mover advantage**
  - Law: Claim first, explain & justify later
  - Digits: Code is law
    - except when it conflicts with law
New Frontiers in Digital Coding

- Growing need for meta-rules or governance
  - Openlaw
  - Kleros
  - Mattereum
  - Aragon Network

- Digital Sovereignty
  - Autonomy from state law, and state coercion?
Example: Crypto-Currencies

- Crypto-currencies have met the same fate as most other “private moneys”
  - Financial assets, the value of which ultimately depends on the ability to convert time into legal tender on demand
    - Only legal tender retains its nominal value

- Stable Coin
  - Fiat-collateralized stable coins
    - 100% reserves of fiat currencies (US$) (history of pegged x-rate regimes)
  - Crypto-collateralized stable coins
    - Ether, Bitcoins exchanged for stable coins
    - Over-collateralization (shadow banking)
  - Non-collateralized stable coins
    - Smart contracts control supply and demand of money to maintain “price stability”
    - Independence from the state is inversely related to their stability
How do States stabilize Fiat Money?

- Anybody can issue an IOU, but not all will find takers (Minsky)
- Unlike private parties, states do not have a “binding survival constraint” (Minsky)
  - Provided, they issue their own money
  - Issue their debt in their own money and under their own laws
  - Can credibly commit their citizens’ future productivity

- Might Cryptocurrencies be a match?
  - Ability to leverage control over others as backstop for their own currency and/or can command the use of their currency
  - Most likely candidates:
    - Tech Companies that can leverage our future data (Facebook, Google)
    - Giant digital retail platforms that can dictate means of pay and settlement (Amazon)

- Limits
  - Physical link to territory
  - Protection of energy farms and storage facility
Accountability of Coders

■ To Whom
  – *Legal Coders: To Sovereign*
    ■ In constitutional democracies: “We, the people”
  – *Digits: ?*

■ Erosion of legal accountability
  – *Choice of law*
  – *Assets without location*
  – *Pace of change*

■ Propensity for holding digital coders accountable?
  – *Knowledge gap*
  – *Digits without borders*
  – *Alliance with digit-friendly states*
Concluding Comments

- The race between the legal and the digital code is on
- The ability of democratically constituted sovereigns to control the legal code has eroded over time
  - *But could be rolled back to some extent*
- Our ability to control the digital code is even more attenuated
- What is at stake?
  - *Our collective ability to self-govern*
  - *Our respective individual autonomy realized within self-governing collectives*
THANK YOU
EXPLANATORY SLIDES
OpenLaw

- Translation of legal into digital code
- Goal: “model all or parts of legal agreements using code”
- Decreasing cost and friction of creating, securing and generating binding legal agreements
- OpenLaw Protocol
  - *Set of templates*
  - *Resource for developers*
  - *Modular*
Mattereum

- “Commercial infrastructure to turn smart contracts into legal contracts that can be efficiently enforced all over the world, without needing new legislation, creating liquidity for $50 trillion of assets globally”
  - By bringing “real world assets” under the “full, legal control of the blockchain”
  - Financial benefit as well as utility tokens
  - First asset: Stradivarius violin worth US$ 9 million

- Automated Custodian as Counterparty to Smart Contract
  - Digital Owner and registrar of assets
    - Registered in “asset passports”
  - Bound to honor smart contracts that control assets

- All asset passports maintained by Registrars comprise “Smart Property Register”
  - No contractual right is valid unless registered
  - Possible to hardwire norms other than economic value (price)
Kleros: Dispute Resolution

- “The Blockchain Dispute Resolution Layer”
- Recognizes the limits of ”smart” contracts – need for dispute resolution
- Kleros links blockchain users to crowdsourced jurors to adjudicate disputes in fast, secure, and affordable manner
- Kleros must be built into the original smart contract
- Tribunal selection from crowd
- Enforcement of verdict through smart contract
Aragon Network

- First digital jurisdiction
  - Social stability within the blockchain ecosystem
- Facilitate more efficient interactions between block-chain native entities
- Using economic incentives
  - Users must “stake digital assets” to participate
- Creating flexible human-readable agreements that are enforceable on-chain
  - Through collateral backed by “stability Reserves”
- Meta-rules (Aragon—Agreements)
  - Specify responsibilities, liabilities and enforcement mechanisms for transactions for which smart contracts are too rigid
- Establishment of Aragon Court
  - Native enforcement mechanism
  - Protected by anti-bribery rules enforced by shaming
Relational Contracting
Competing Claims
A Legal Code

Property, Collateral, Trust, Entity & Bankruptcy Law
Hierarchy of Rights

- Property rights trump contractual rights
- Secured rights trump unsecured rights
- Within same class: seniors trump juniors
- Enforceable against the world
Competing Laws
Competing Laws
Conflict of Laws

- Choice of law
  - Private autonomy
    - Contract law
  - Mutual recognition
    - Corporate law
- Legal Harmonization
Enforceability

- Within jurisdiction
  - Domestic courts & bailiffs
- Across jurisdictions
  - Foreign state courts: if bilateral treaty in effect
  - Foreign & international arbitration tribunals
    - 1958 New York Convention
      - 149 countries are members