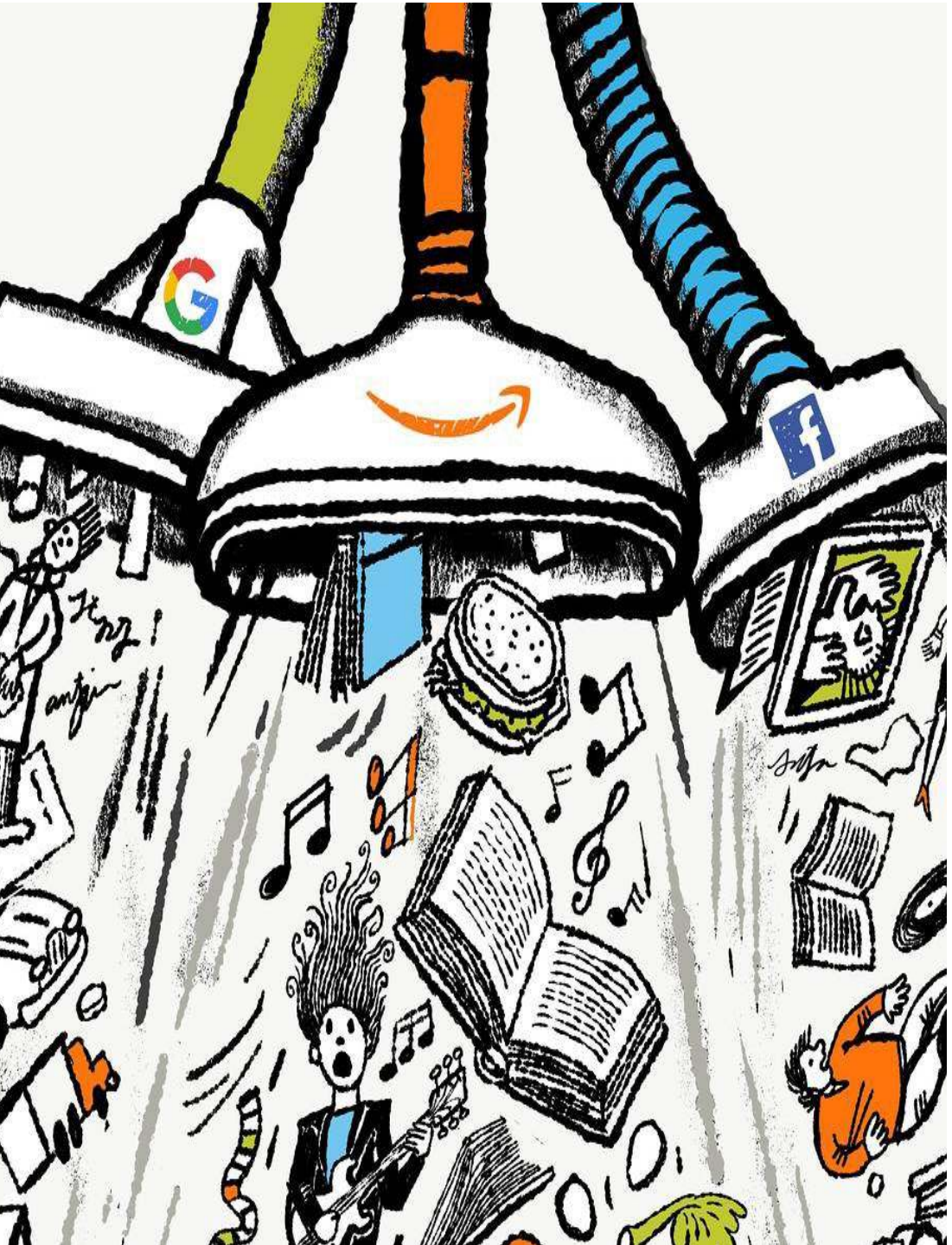

THE POLITICAL CROSSROADS OF DIGITAL CAPITALISM

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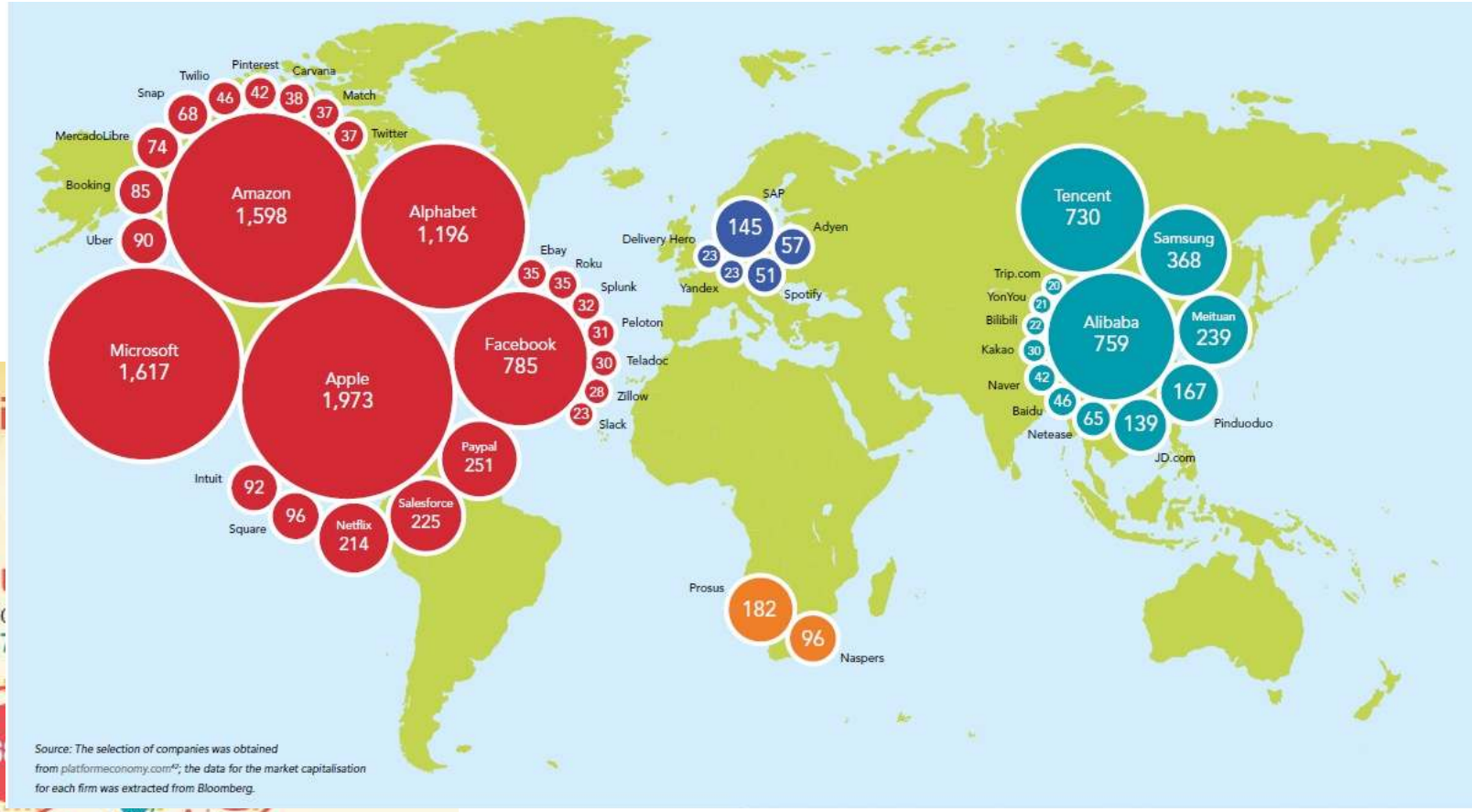
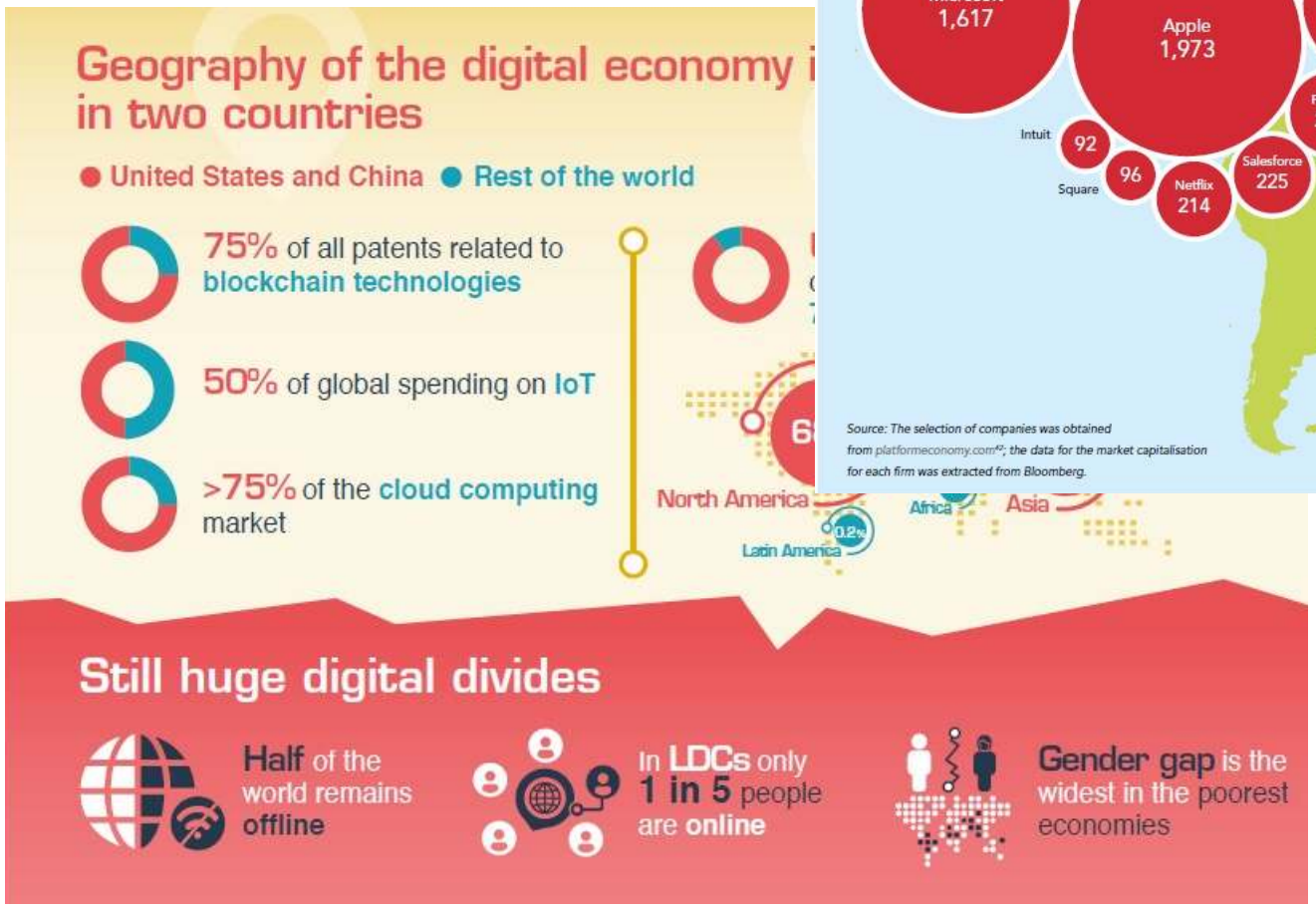
Digital capitalis concentration



Source: SOMO (2021)



Source: UNCTAD (2019)

Industrial policy for the Digital Economy

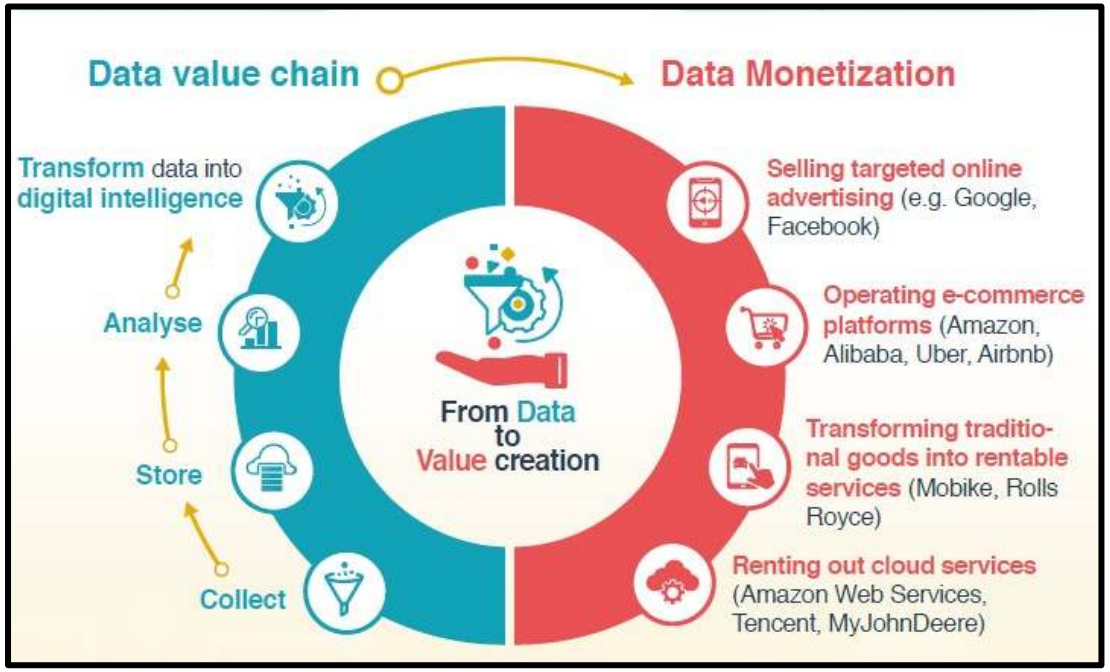
- In an EC whitepaper on AI called "A European approach to excellence and trust": EC proposes STI-policy initiatives to strengthen Europe's position.
- Goal: "to achieve an 'ecosystem of excellence' along the entire value chain, starting in research and innovation, and to create the right incentives to accelerate the adoption of solutions based on AI, including by SMEs"
- Since 2020, EU-commission has raised issues in relation to the wave of GAFAM-acquisitions

Digital Markets Act

- “A single set of rules” for the EU to have more bargaining power
- Focus on core platform services with a market capitalisation of at least € 75b or an annual turnover of € 7.5b .
- Regulation: platforms’ potential role as gatekeepers that are not necessarily dominant in competition–law terms.
- Antitrust at the EU level: carry out market investigations and sanction non–compliant behaviour.

Will this policy framework work?

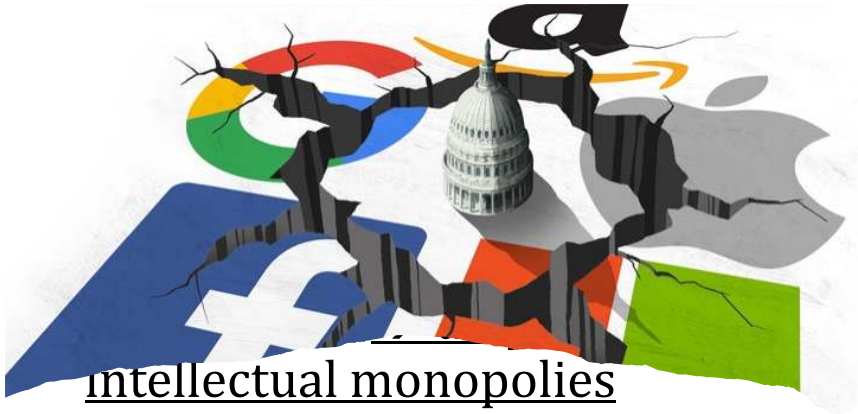
- Past fines were never cashed. Google Shopping (2010), Google's Android (2015) and Google AdSense (2016).
- EC ruled against Apple and Ireland (illegal state aid through selective tax break) but the EU general court annulled the decision
- Tech giants can afford to operate without privileging their products over others in their marketplaces because of the popularity of their products.
- Even if each firm (and person) gets access to its data, this will not alter the balance of power.



Source: UNCTAD (2019)

Why are these policies ill–equipped?

- The limits of Antitrust. Is more competition the solution?

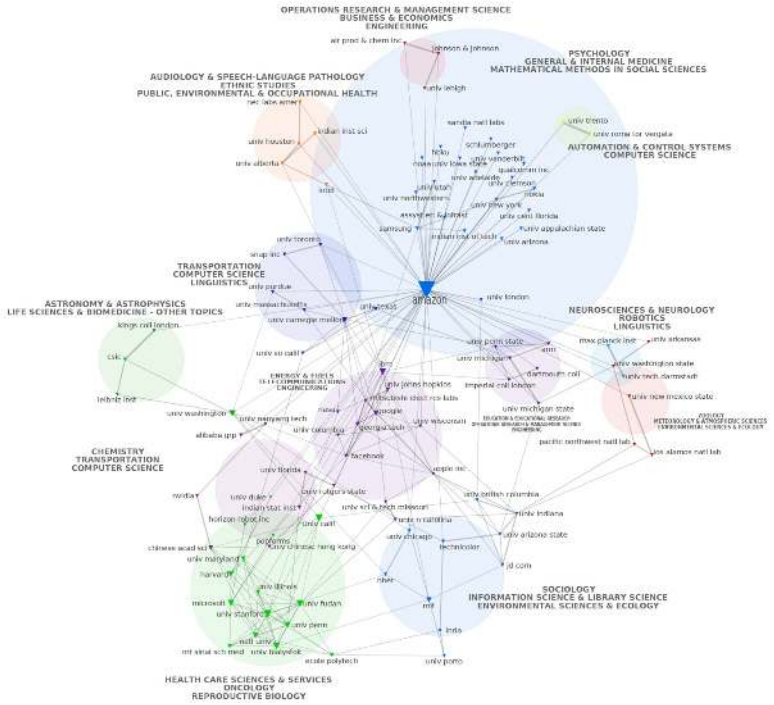


intellectual monopolies

How probable is the IMs scenario?

- Cumulative causation + Absorptive capacity → firms' technological differentiation
- Higher costs of doing R&D
- Recent technological change: ICT revolution + more S&T based production enabling knowledge modularity
- Institutional / Political Transformations:
  - IPRs regime: within the US (From Goodwill to Workplace knowledge law incl/ Trade Secret & then Bayh–Dole Act + others) and at the global level (TRIPS)
  - Strategic tax planning/regulatory arbitrage: particularly beneficial for MNEs intensive in intangible assets
  - Anti–trust control was weakened: Chicago Boys & the "consumer welfare" doctrine. Focus: consumer prices
  - Hidden industrial policy, among others connected to the military in the US

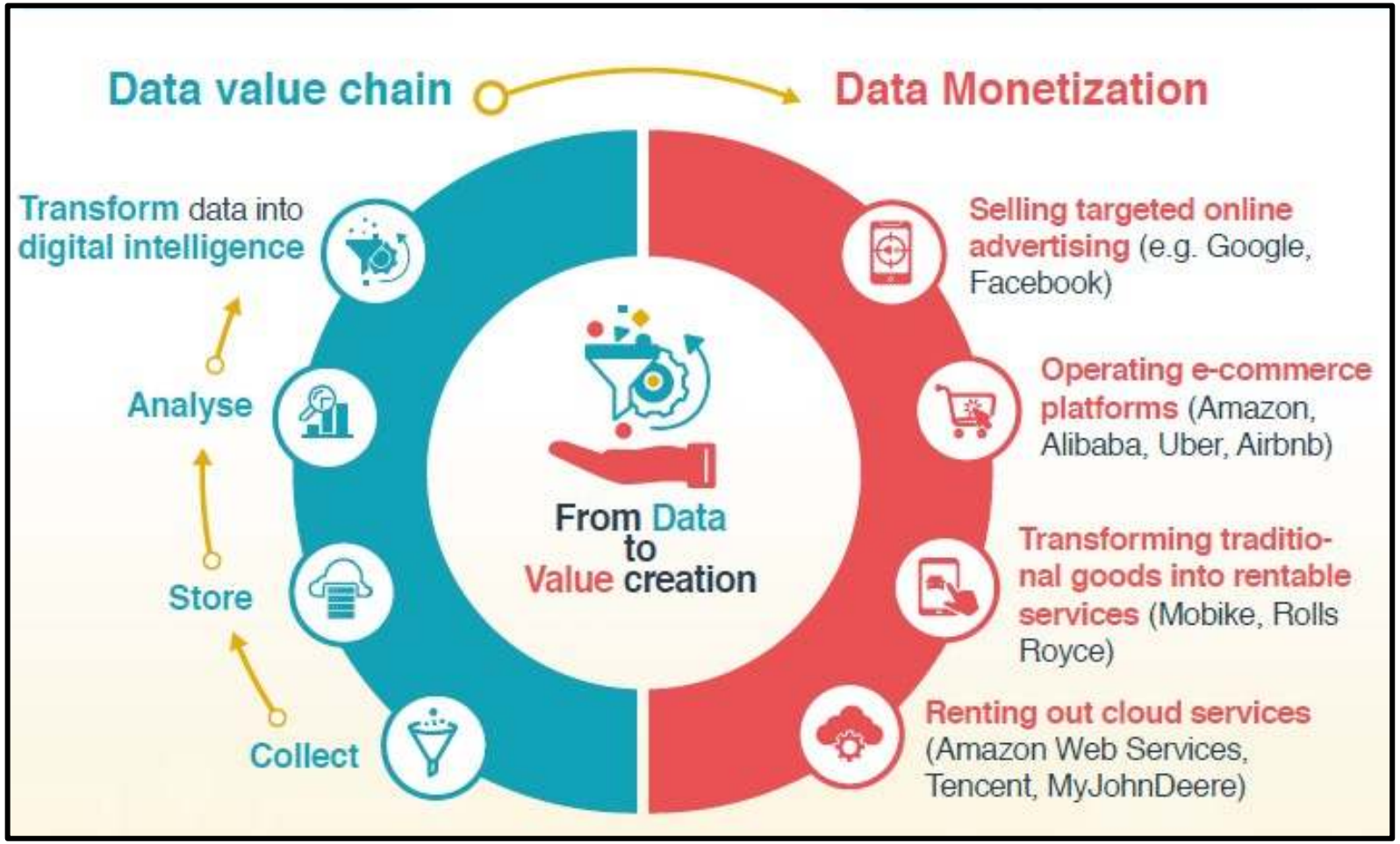
Intellectual Monopolies



- Knowledge is power: **from a temporary to a permanent advantage** (permanent & proactive rentiers)
- Rely on a permanent and expanding monopoly over portions of society's knowledge transformed into intangible assets (**knowledge** & **data appropriation**)
- **Monopolizing access to knowledge** › **IPRs concentration**
- IMs ≠ market monopolies → **firms' technological differentiation** (IMs vs subordinate firms)

Data–Driven Intellectual Monopolies:

Big Data + ML



Source: UNCTAD (2019)

KNOWLEDGE & DATA APPROPIATION

- Data stored in public cloud: 5% of worldwide data storage in 2010 → 20% by 2018.

- Amazon, Microsoft, Google and Alibaba stored in their public clouds around 4.9% of the global data stored worldwide in 2015 and already 22.8% in 2020

- Between 2010 and 2018, Amazon's datacentres grew 1,337% in surface area

- Microsoft has over 100 datacentres in 54 regions of the world

- 50% undersea internet cable GAM+ Meta

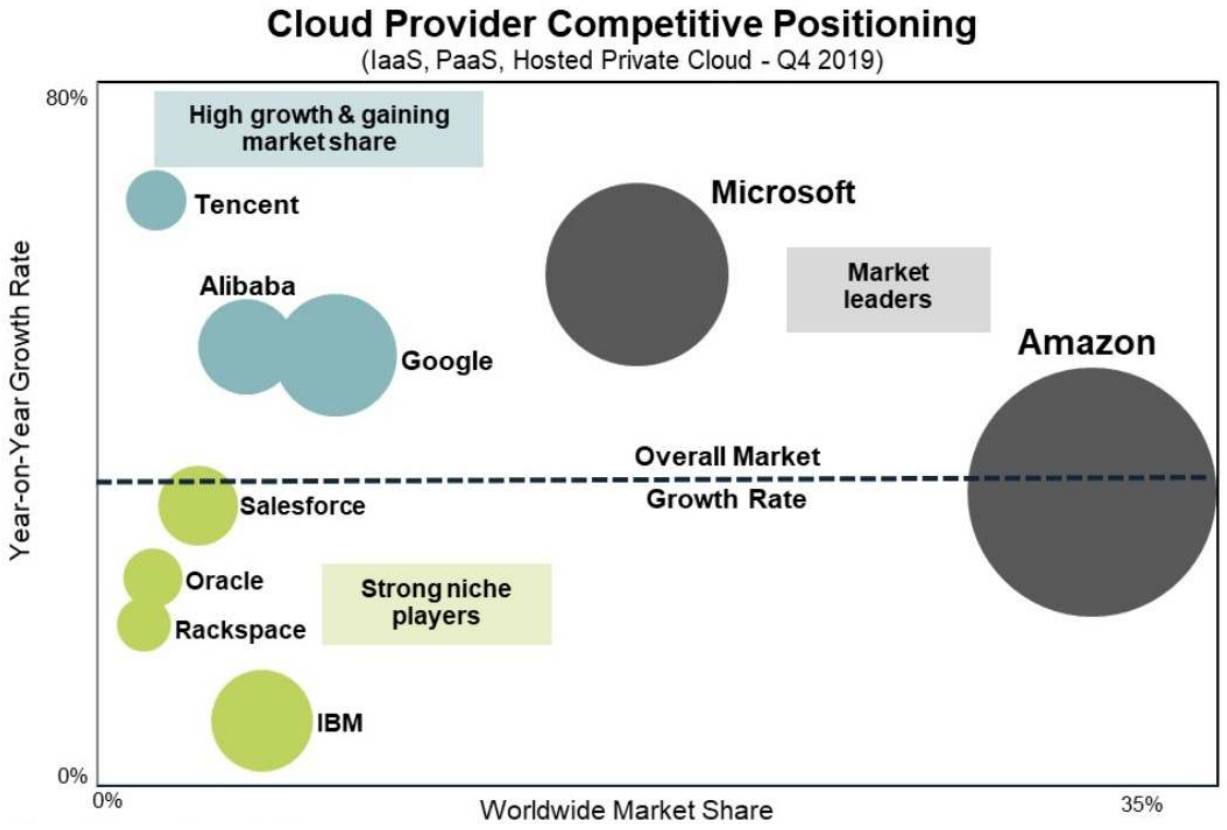
Scientific publications' semantic analysis

(2014-2019) Source: Web of Science

Google	Amazon	Microsoft	Tencent	Alibaba
machine learning	machine learning	machine learning	neural network	neural network
neural networks	deep neural networks	speech recognition	convolutional neural network	recommender systems
speech recognition	neural network	data sets	social networks	reinforcement learning
Deep learning	genetic algorithm	training data	machine learning	user behavior
deep neural networks	data sets	neural networks	benchmark datasets	deep neural network
language model	cloud computing	video coding	training data	convolutional neural network
acoustic models	natural language	language model	Neural Machine Translation	social networks
approximation algorithms	speech recognition	social networks	image retrieval	data sets
learning algorithms	knowledge graph	search engine	big data	natural language
reinforcement learning	convolutional neural network	based approach	topic model	e-commerce platforms
training data	acoustic model	data center	attention mechanism	proposed algorithm
mobile devices	training data	image retrieval	representation learning	big data
recurrent neural networks	data centers	natural language	computer vision	search engine
natural language	predictive models	computer vision	target domain	attention mechanism
search engines	social media	deep neural networks	domain adaptation	Online Shopping
computer vision	computer vision	mobile devices	transfer learning	benchmark datasets
automatic speech recognition	approximation algorithms	data structures	feature learning	question answering
efficient algorithms	data streams	web search	reinforcement learning	network based
convolutional neural networks	learning algorithms	convolutional neural network	learning approach	display advertising
energy efficiency	sentiment analysis	learning algorithms	learning algorithm	user experience
data mining	object detection	programming language	search results	representation learning
voice search	Big Data	search results	face alignnment	transfer learning
language processing	topic models	software engineers	face images	short text
computational cost	transfer learning	recurrent neural network	community detection	data analytics
cloud computing	word embeddings	approximation algorithms	learning methods	recurrent neural networks

CLOUD COMPUTING, OR HOW TO CURTAIL LEARNING BY USING

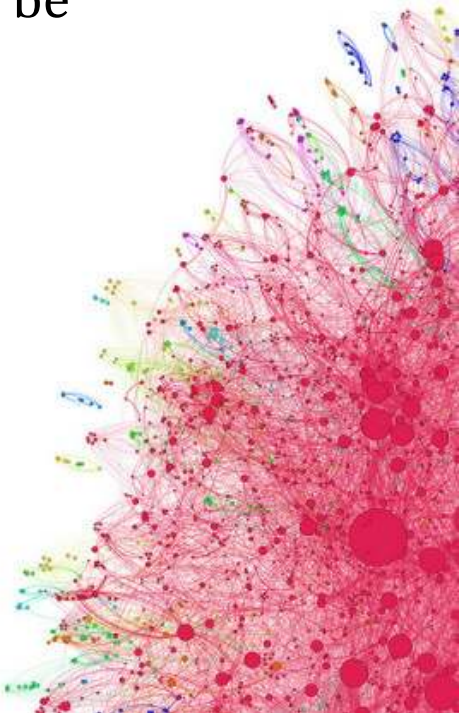
- AI in the cloud: i) GPU for AI and store data, ii) access to standardized databases to train algorithms, and iii) AI models
- While clients pay as they use the services and entering fees are low, long-term contracts and high exiting fees lock them in
- **Services sold as black-boxes**: innovation's user-producer interactions as a power relation
- Cloud computing dependence allows tech giants to early notice when companies (or certain initiatives) are thriving



Source: Synergy Research Group (2019)

IM's Corporate Innovation System

- A (usually global) system organized and controlled by the IM, constituted also by subordinate organizations (such as innovating companies, universities and other PROs) participating in innovation networks
- IM defines the general R&D orientations without anticipating every step to be followed and leaving degrees of autonomy to subordinate actors
- Subordinate participants are in charge of a stage/s of the innovation process. Most of the CIS associated rents are garnered by the IM (knowledge predation)
- Intellectual rents' concentration → polarization



Tech giants' co–authorships and co–ownerships

Source: Web of Science & Derwent Innovation

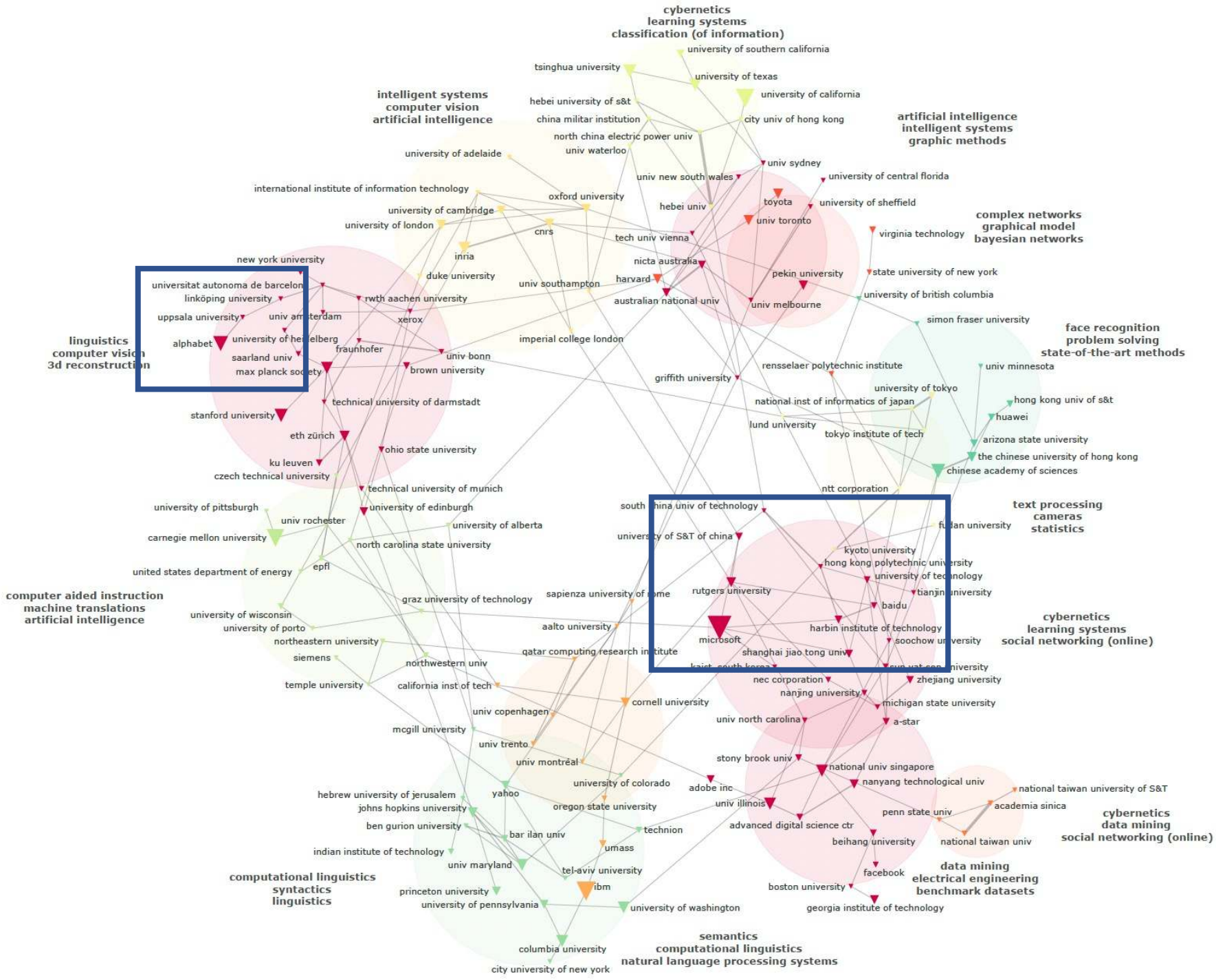
Company	Publications (until 2019 included)	Co-authoring organizations	Applied and granted patents (until 2017 included)	Co-owned patents with other organizations
Amazon	824	766	10063	13 (0.1%)
Microsoft	17405	4025	76109	160 (0.2%)
Google	6447	3397	25538	65 (0.3%)
Tencent	643	366	5462	13 (0.2%)
Alibaba	685	427	3532	0 (0%)

Dominating the AI research agenda

Top AI conferences

(2012-2014)

Source: Scopus



Dominating the AI research agenda

Top AI conferences

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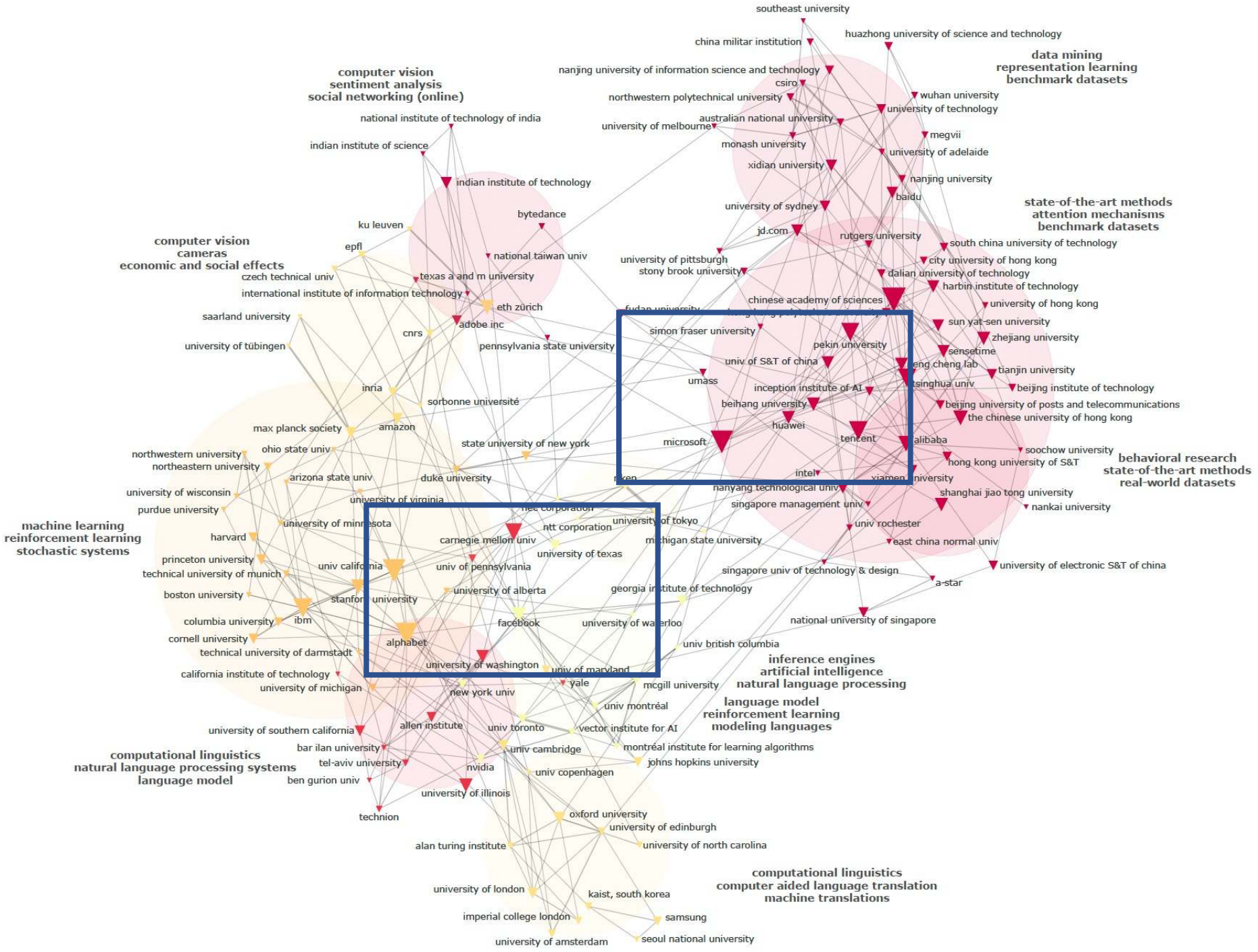


What is to be done? STI policy & more

STI policies by themselves will most likely favour IMs → knowledge predation + IM set STI agendas. Market regulations are ill-equipped

A new common knowledge regime (+ public & free education). Global & regional public natural monopolies (Socialize data and algorithms)

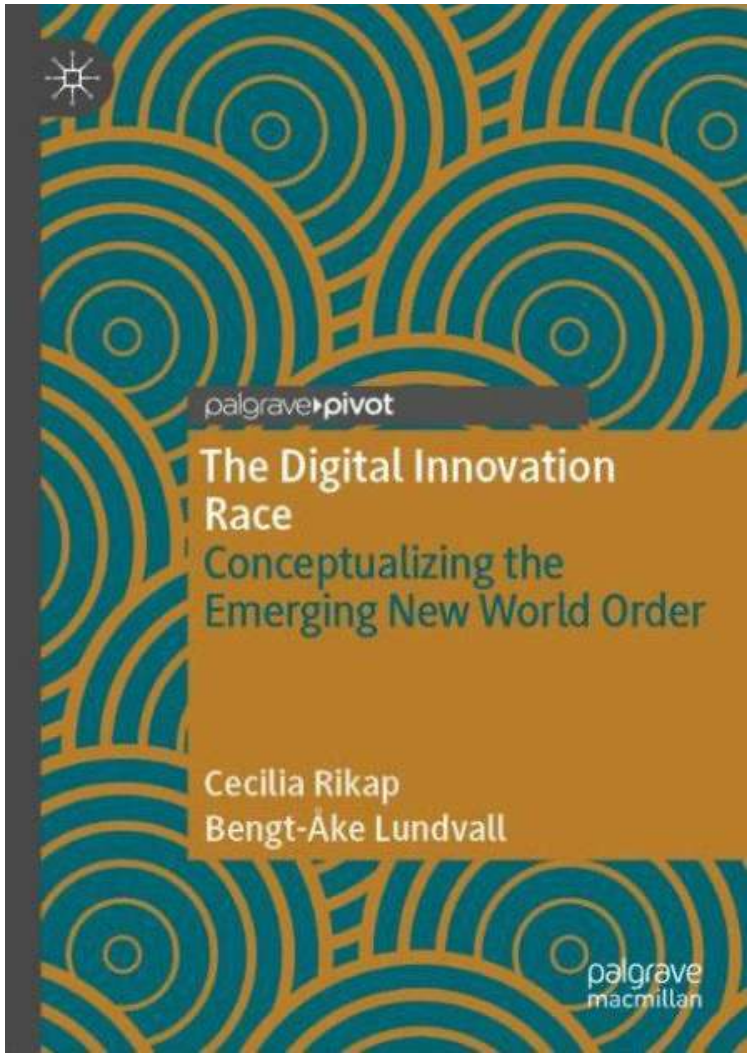
Feasible: automatic waiver for knowledge that could alleviate social, health, ecological hardships

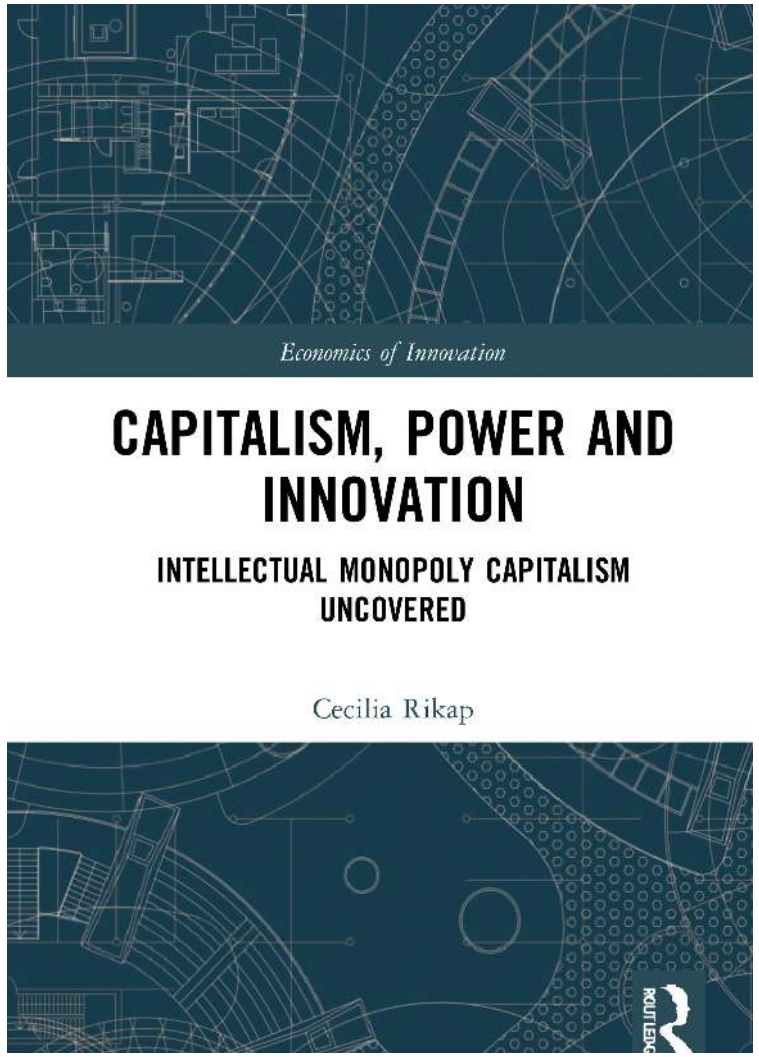
What is to be done? Taxing

Progressive tax on owners of digital databases created from centralizing third-party data.

Taxing leading corporations' revenues and financial gains: shareholders & asset managers.

A recovery plan: Integrated economic, political, social and ecological plan for humanity.





Thanks

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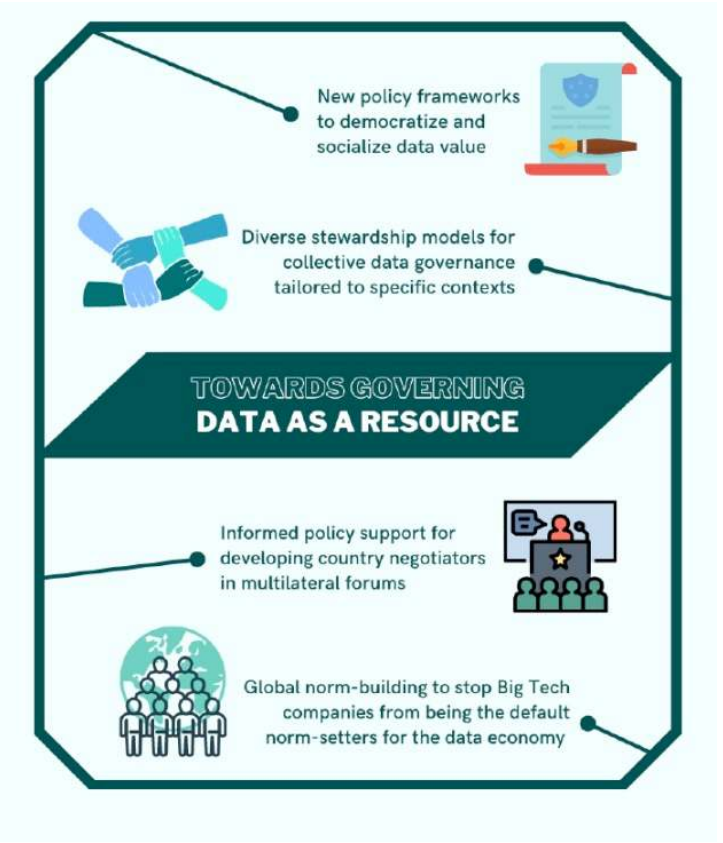

Governing Data

Innovation & capitalist competition

	Schumpeter Mark I: creative destruction	Schumpeter Mark II: Big corporation as the innovator	Intellectual Monopoly
Who innovates	Any firm in the industry	Big firms in the industry	The same leading corporations with maximum absorptive capacity and concentration of intangible assets
Firms' technological differentiation	No	Yes	Yes
Learning by using of the adopter (adapter)?	Yes	Yes	Yes
Predominant Learning Mode(s)	DUI learning (also STI learning)	STI learning (also DUI learning)	STI learning (also DUI learning)
Temporality of the innovation privilege	Temporary	Temporary	Permanent
Innovation pace	Discrete	Discrete	Systematic
Schematic model	T_1: Firm "i" innovates	T_1: Big firm "i" innovates	T_1 to T_n: The same leading firm innovates systematically.
	T_2: The rest of the industry either adopts or leaves the market. Adopters pay intellectual rents only temporary	T_2: The rest of the industry either adopts or leaves the market. Adopters pay intellectual rents only temporary	T_2 to T_{n+1}: Complier firms adopt some modular innovations but always paying intellectual rents
	T_3: Firm "j" innovates	T_3: Big firm "j" innovates	T_{1+x} to T_{n+x}: The rest of the industry only ocassionally adopts innovations remaining as laggards or leaves the market
	T_4: The rest of the industry either adopts or leaves the market. Adopters pay intellectual rents only temporary	T_4: The rest of the industry either adopts or leaves the market. Adopters pay intellectual rents only temporary	
Innovation-driven economic growth (system level)	Yes	Yes	Shrinked