AI's Use of Knowledge in Society

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NBER

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Harvard Society of Fellows

September 18, 2025

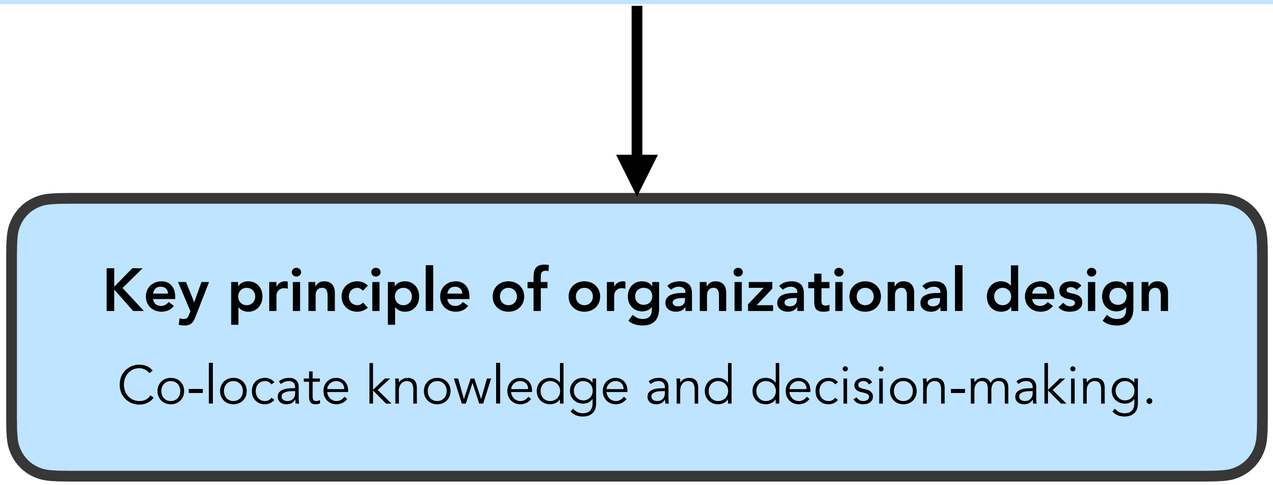
NBER Workshop on Transformative AI

Organizations and markets are information processors

They take in information and knowledge and produce allocation decisions.

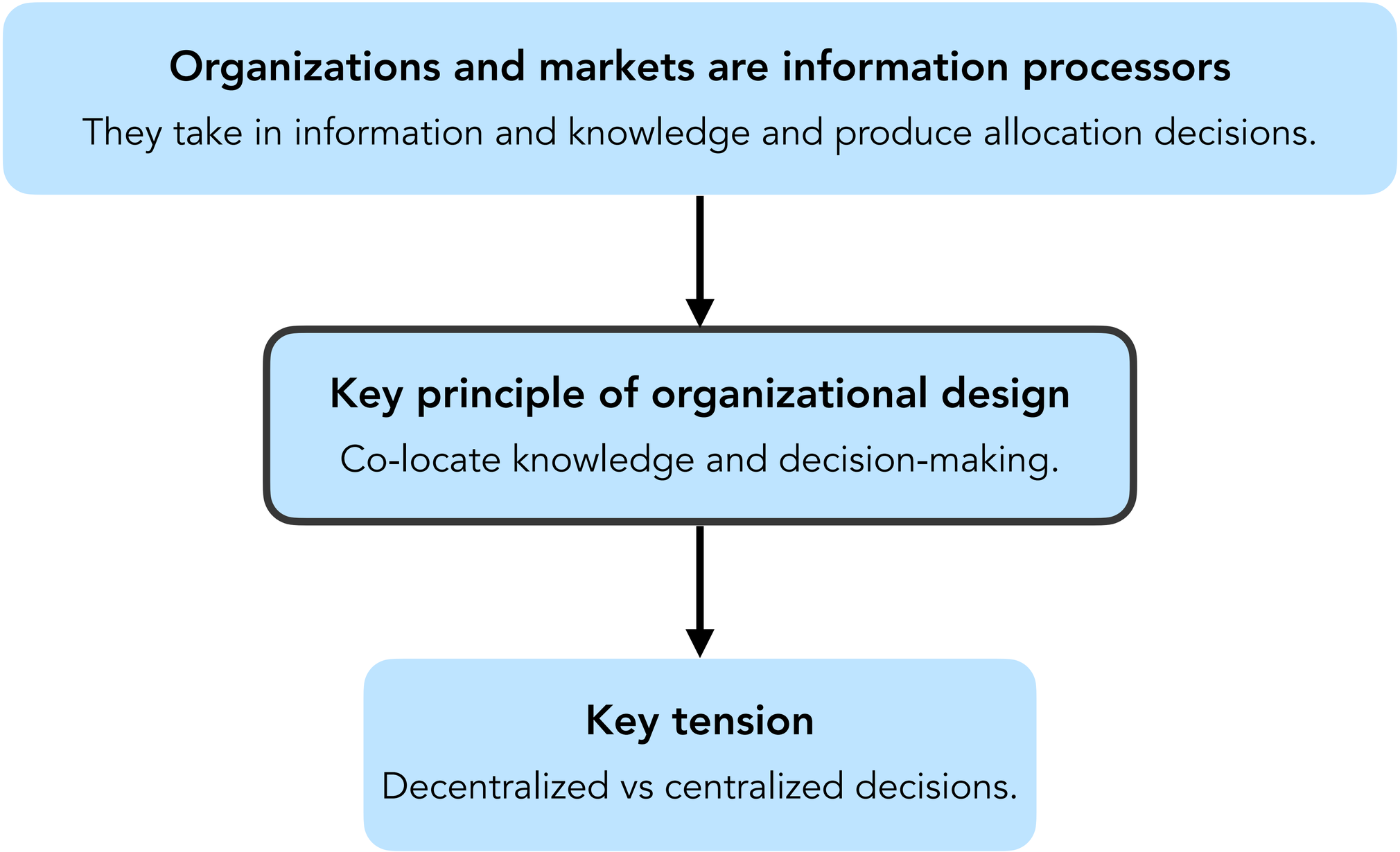
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Key principle of organizational design

Co-locate knowledge and decision-making.

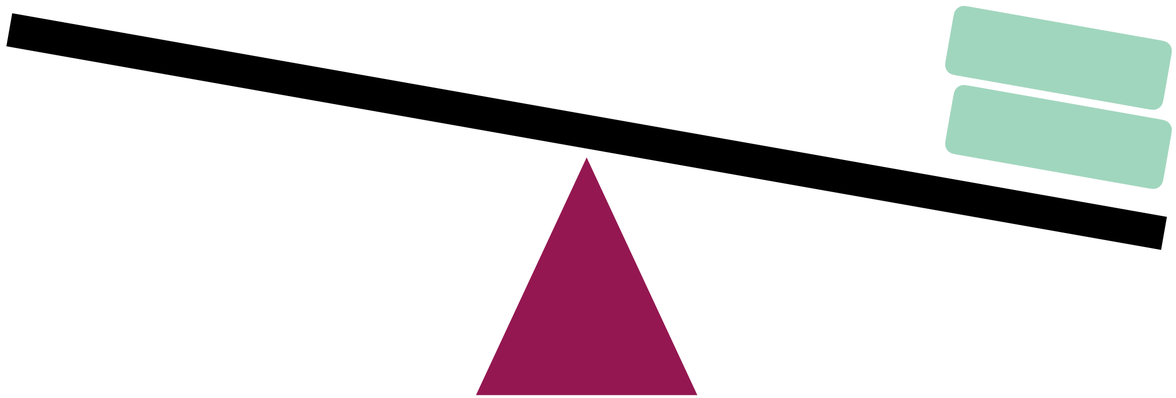

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Key principle of organizational design
Co-locate knowledge and decision-making.
Key tension
Decentralized vs centralized decisions.



Decentralization

Centralization

Centralization enables coordination.



Decisions are interdependent, one decision-maker best coordinates decisions

Decentralization

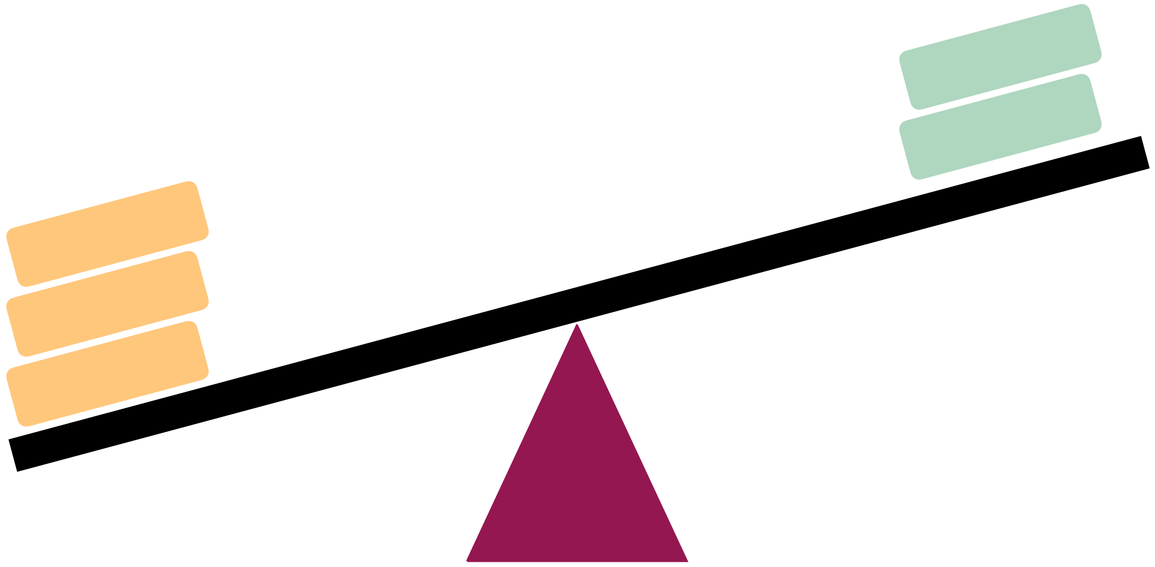
Centralization

Decentralization uses local knowledge.

Centralization enables coordination.

Hayek's argument.

Knowledge relevant to allocation is dispersed, local, and tacit. It cannot be codified. Decisions are best made locally.



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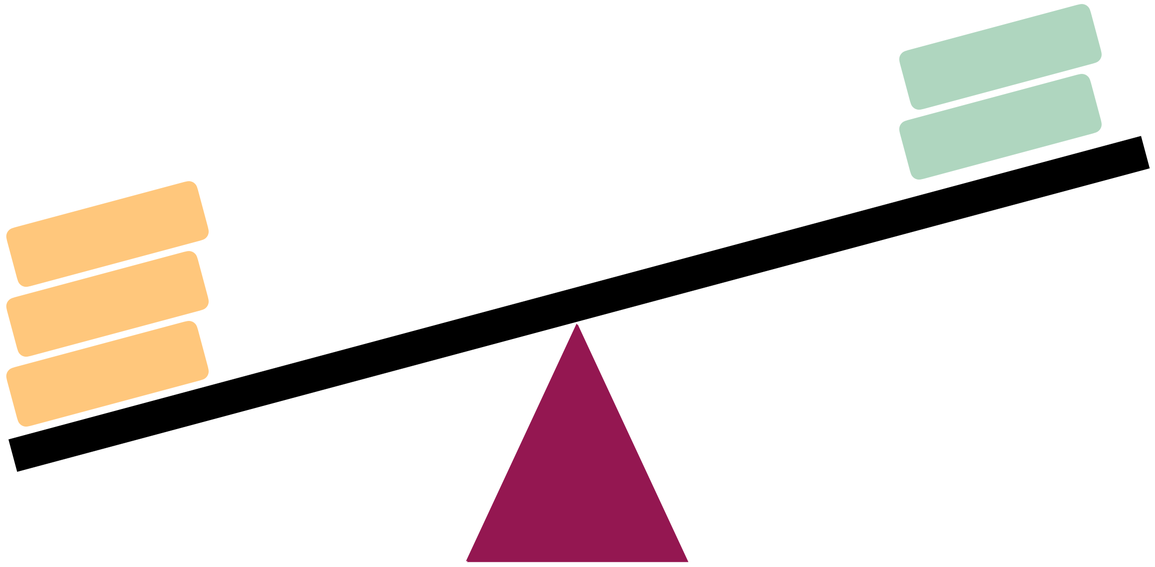
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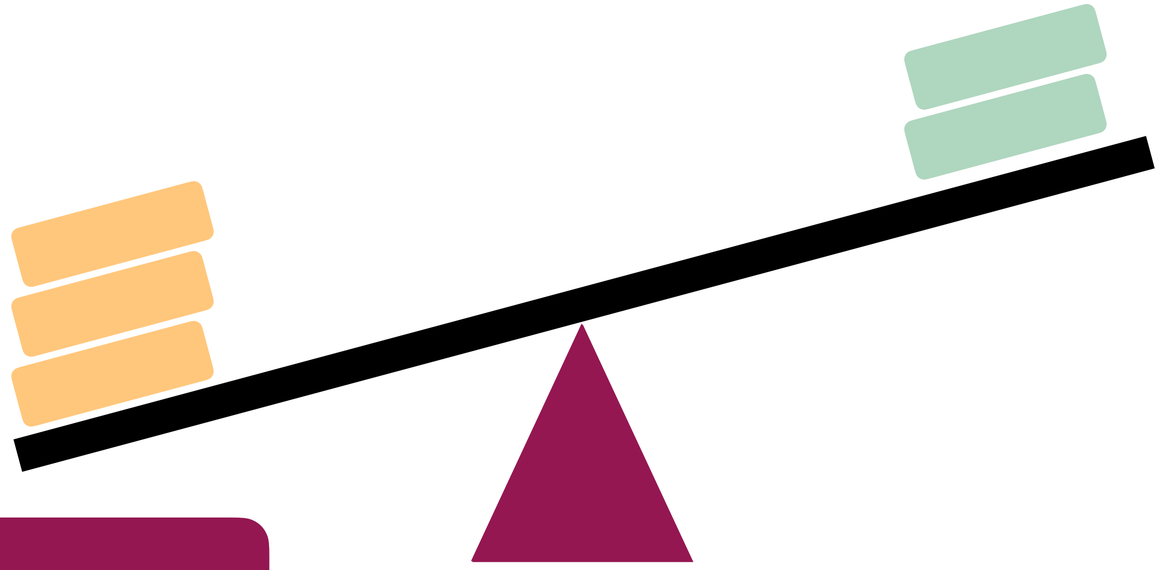
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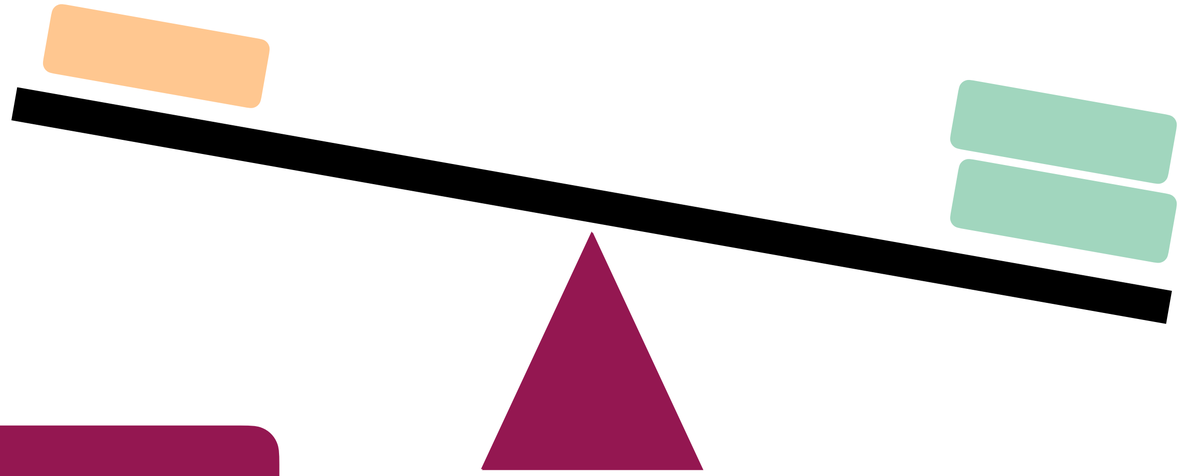
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OUTLINE

ONE

AI & Centralization: A Property Rights Approach

AI codifies local knowledge
AI increases bounds on processing

TWO

Countervailing Forces

THREE

Early Empirical Evidence

FOUR

Political Implications & Conclusions

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Political Implications & Conclusions

- Two agents: entrepreneur E and headquarters H
- Two assets: $a_E, a_F \in A$, with
  - Physical asset a_F
  - Information asset a_E possessed by entrepreneur
- Ownership regime $\rho : A \to \{E, H\}$
- Non-contractible investments x_i at convex cost $c(x_i)$
- Joint surplus with both assets $V(x_E, x_H)$
  - $V(\cdot)$ is increasing and concave in x_i
  - Physical a_F and information a_E asset are strict complements
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Timing.

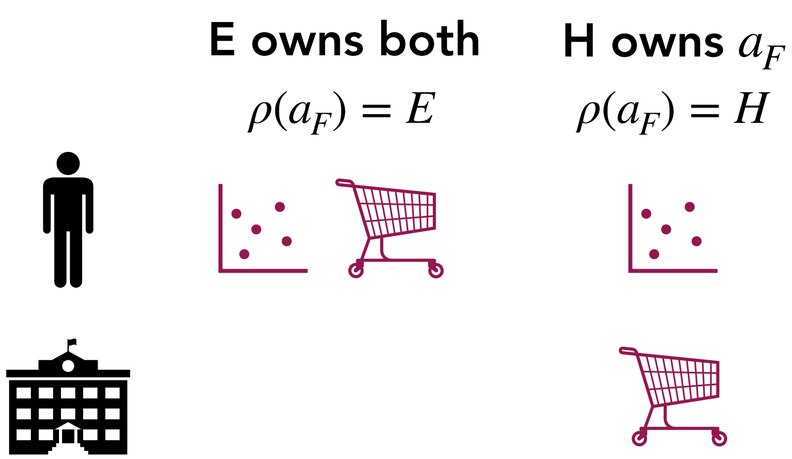
1. Ownership regime ρ determined.
2. Agents make investment decisions (x_E, x_H).
3. Surplus realized, gains from trade split:

   → bargaining is efficient.

   → outside options determined by ρ.

Case 1. The information asset is inalienable.

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$\rho(a_F) = E$



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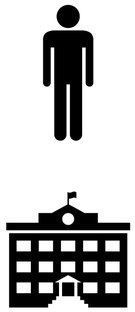
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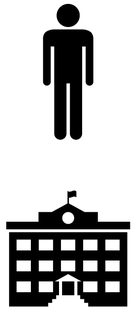
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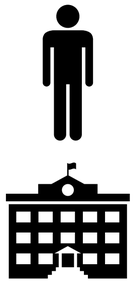
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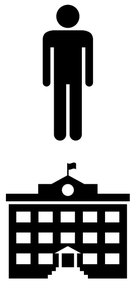


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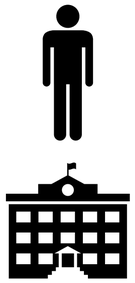


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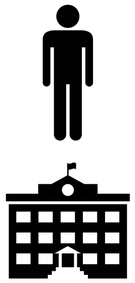


How TAI increases alienability.

- Digitization of explicit knowledge.
- Codification of tacit knowledge.
- Discovery of machine-native knowledge.

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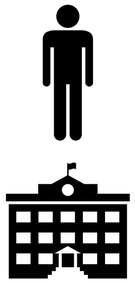
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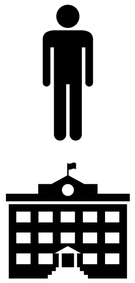
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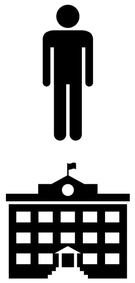
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Marginal value of investments for joint surplus and solo surplus.

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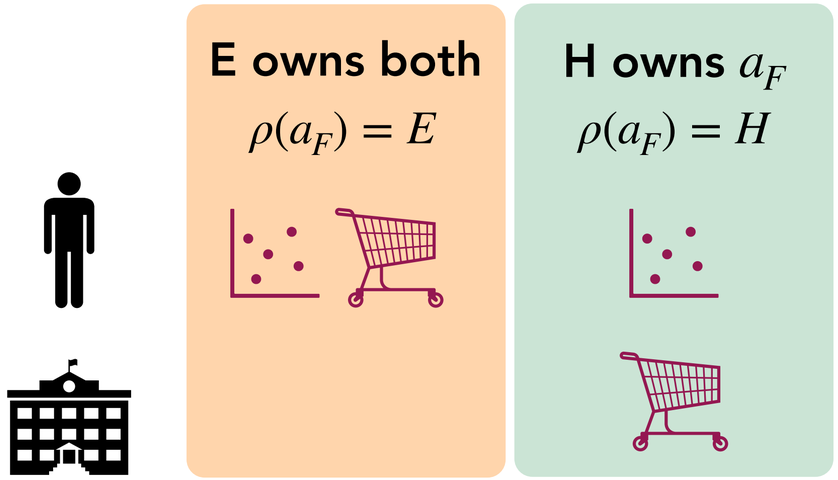
Taking stock: Case 1 vs Case 2?

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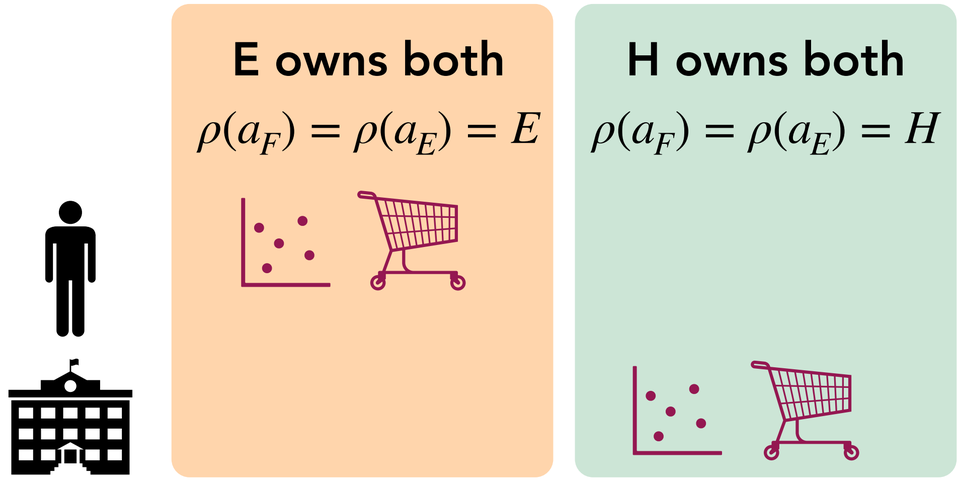
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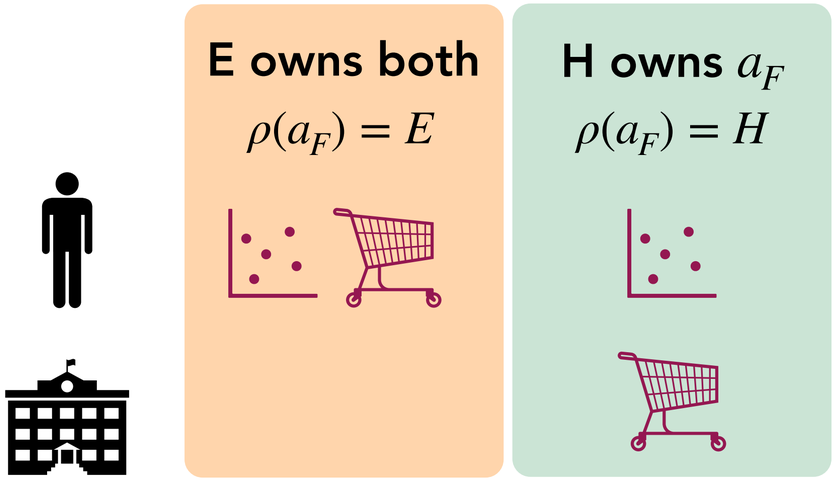
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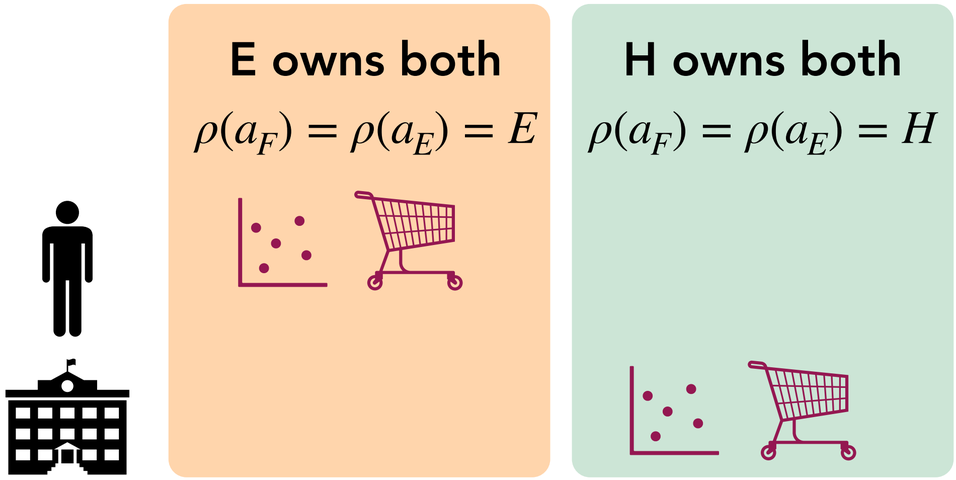
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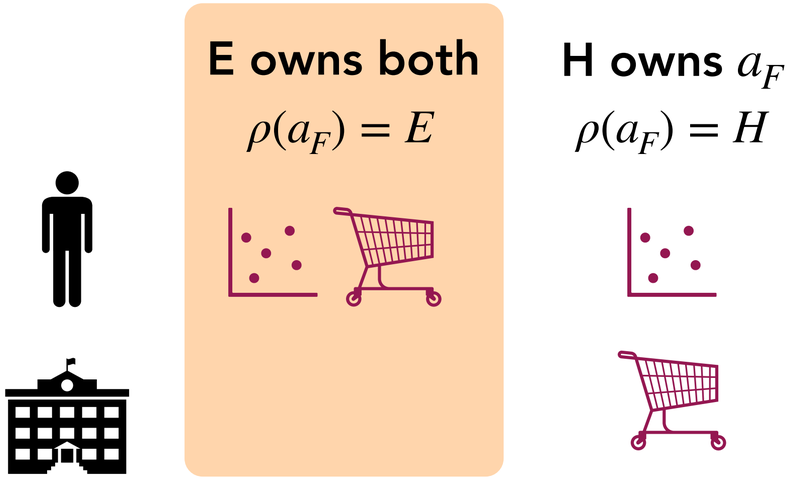
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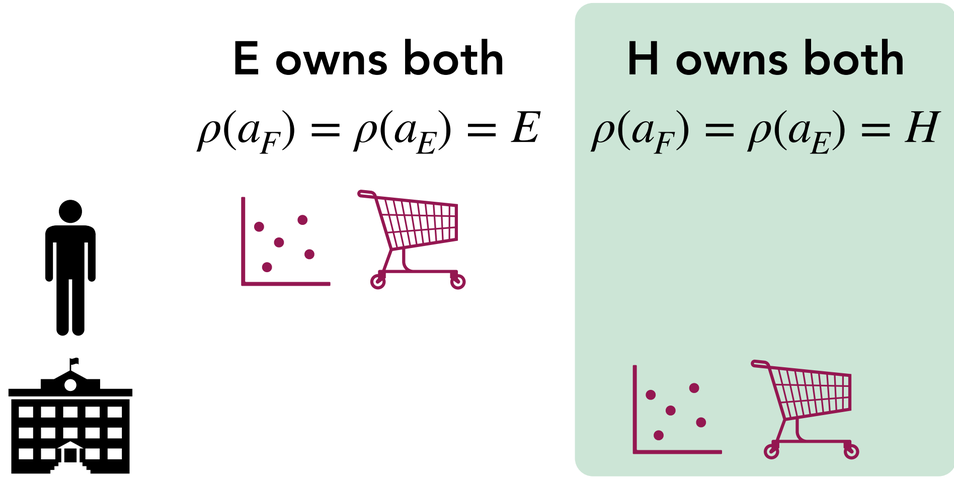
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Suppose HQ contracts with many entrepreneurs.

Suppose in Case 2, H ownership is optimal in every bilateral case.

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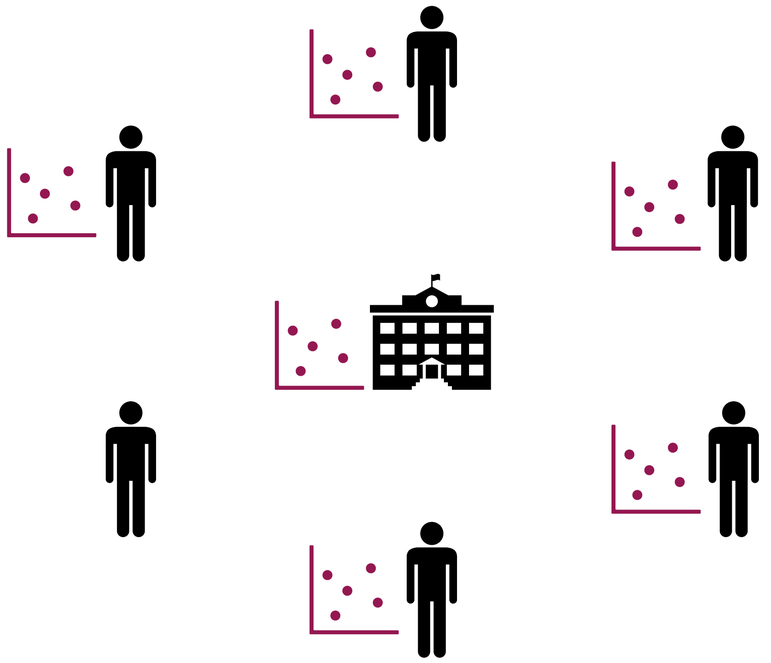
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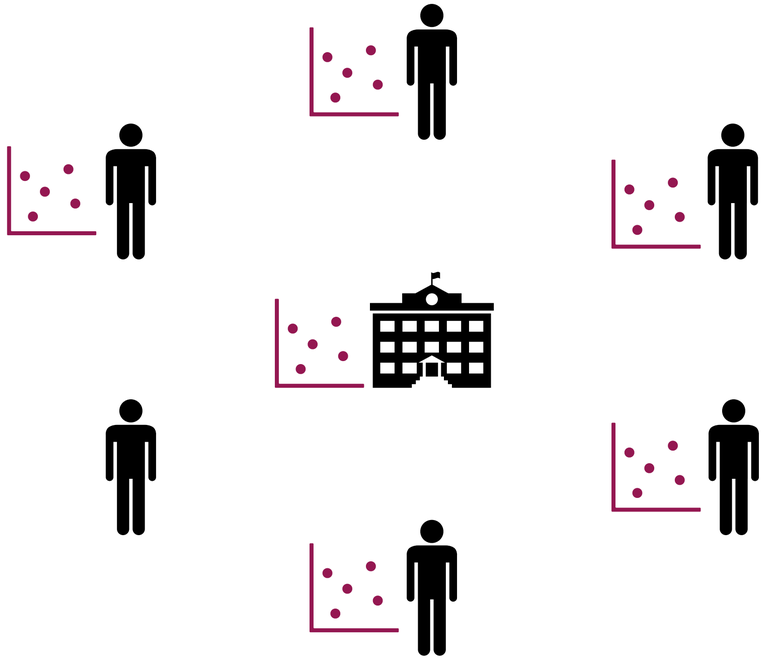
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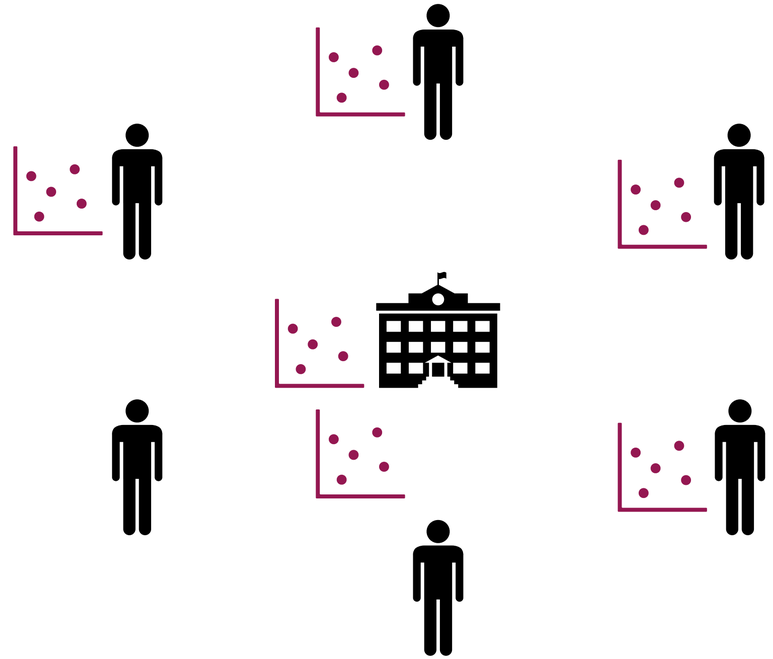
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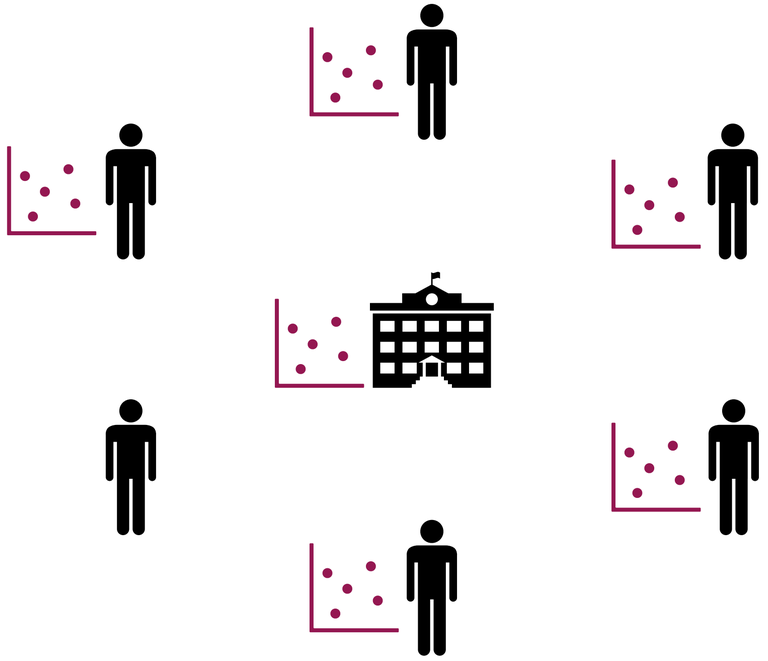
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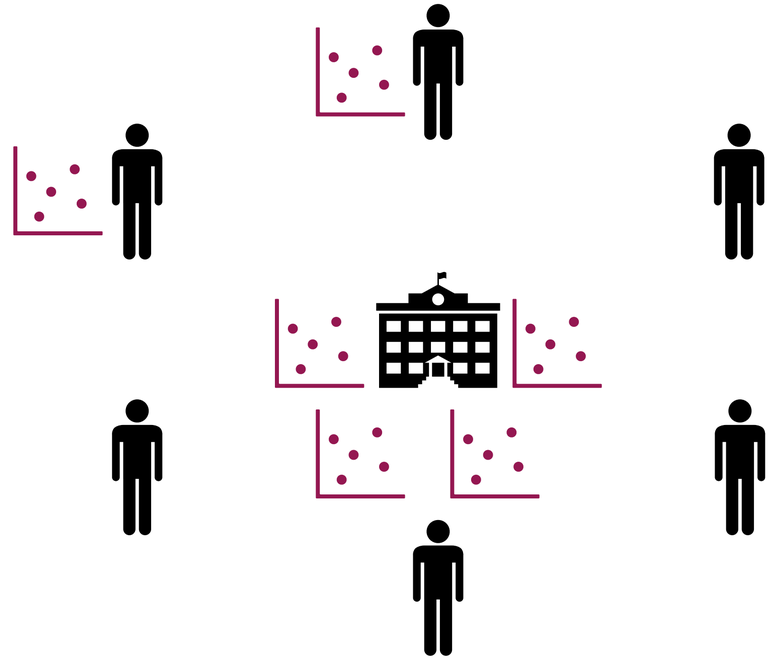
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But, there is a limit *K* to how many info assets HQ can effectively process.

How TAI effects info processing.

- Powerful & cheap search and delegation.
- Expansion of "working memory."





As *K* increases, more information assets move to the center.

Case 3. Information processing limits.

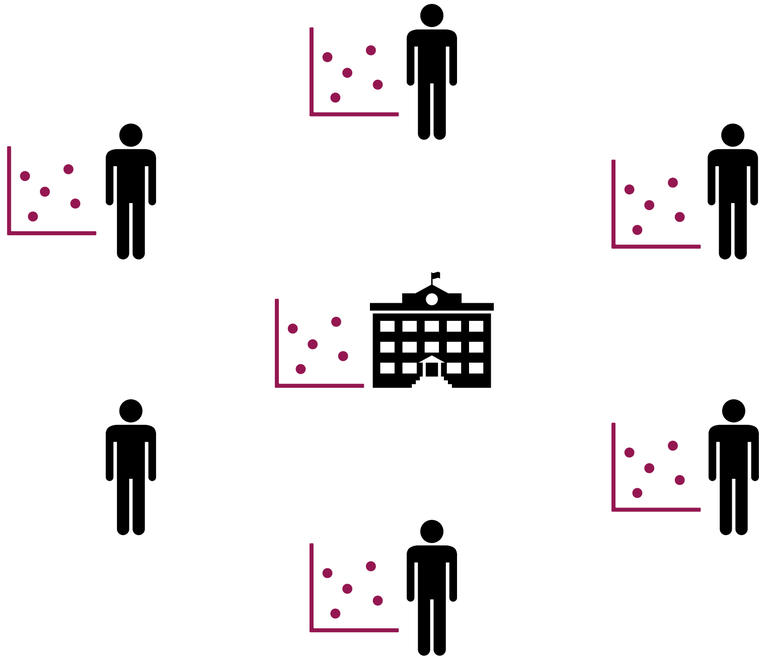
Suppose HQ contracts with many entrepreneurs.

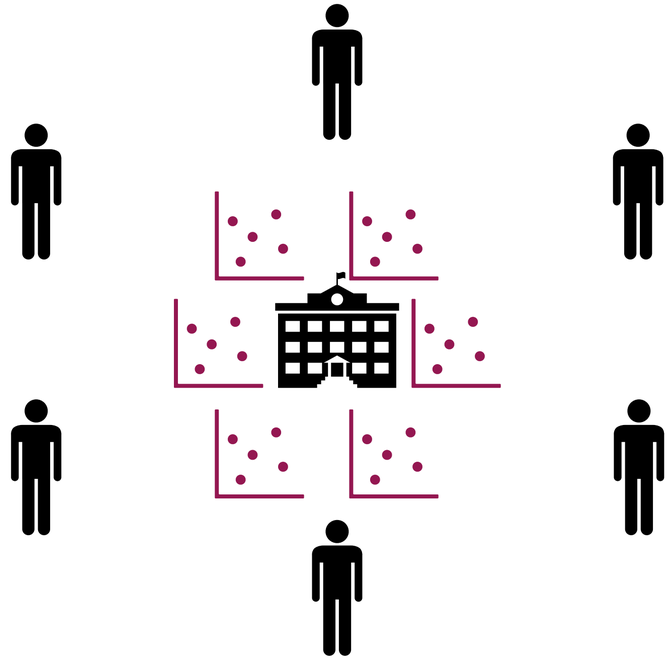
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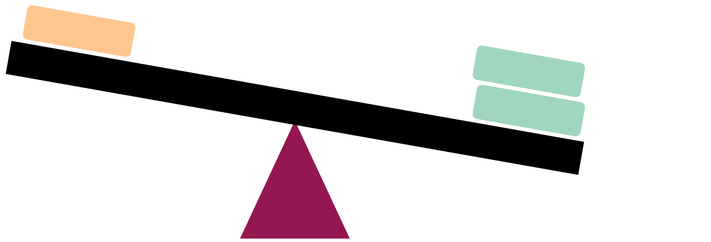
How TAI effects info processing.

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How TAI increases alienability.

- Digitization of explicit knowledge.
- Codification of tacit knowledge.
- Discovery of machine-native knowledge.

How TAI effects info processing.

- Powerful & cheap search and delegation.
- Expansion of “working memory.”

OUTLINE

ONE

AI & Centralization: A Property Rights Approach

AI codifies local knowledge
AI increases info processing

TWO

Countervailing Forces

THREE

Early Empirical Evidence

FOUR

Political Implications & Conclusions

OUTLINE

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Political Implications & Conclusions

Countervailing force #1: There are limits to the knowledge that can be codified.

- AI challenges with learning "the long tail."
- AI challenges with learning embodied knowledge (e.g., perception, dexterity).

  ↪ Yes – but fights the premise of the workshop!

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Countervailing force #2: Even a fully AI economy could be partially decentralized.

- Laws of physics require some amount of decentralization.
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- AI can empower the periphery as much as it empowers the center.
  ↳ Maybe, but there's emerging evidence that single agents beat complex multi-agent set ups.

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Countervailing force #3: Legislative requirements will limit centralization.

- Antitrust, occupational licensing could prevent large AI-powered firms from forming.
- Will AI have legal rights (e.g. hold bank accounts, personhood, liability)?
  ↳ Yes – but more in the realm of politics and law than economics.

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EARLY EMPIRICAL EVIDENCE

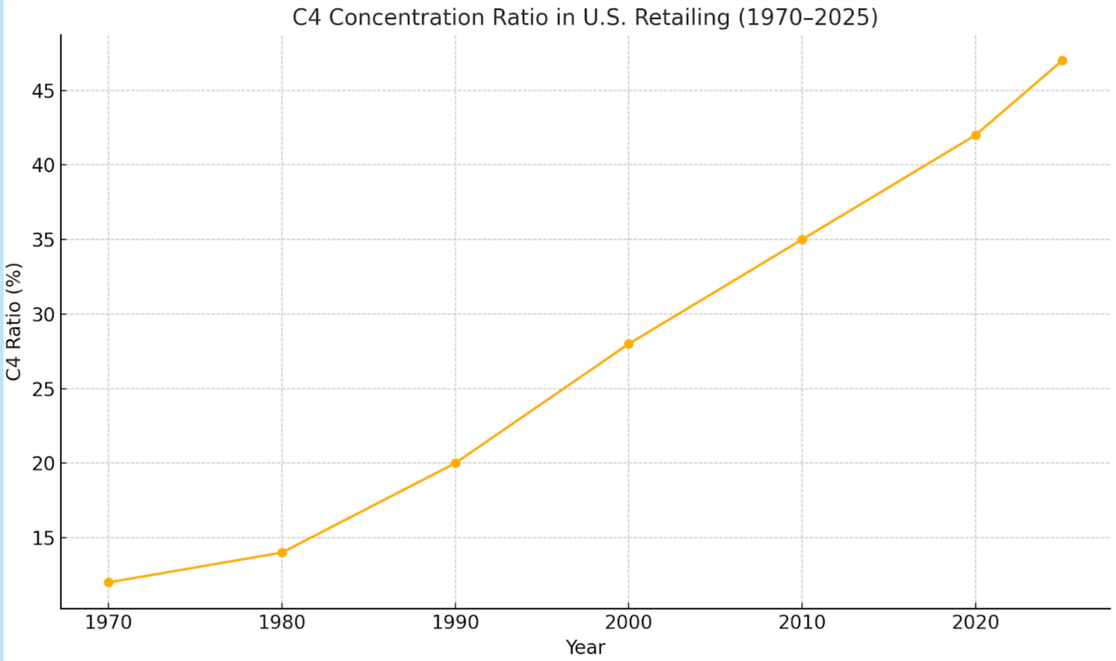


EARLY EMPIRICAL EVIDENCE



Early empirical evidence #1.

Rising concentration – especially in retail, finance, and utilities.

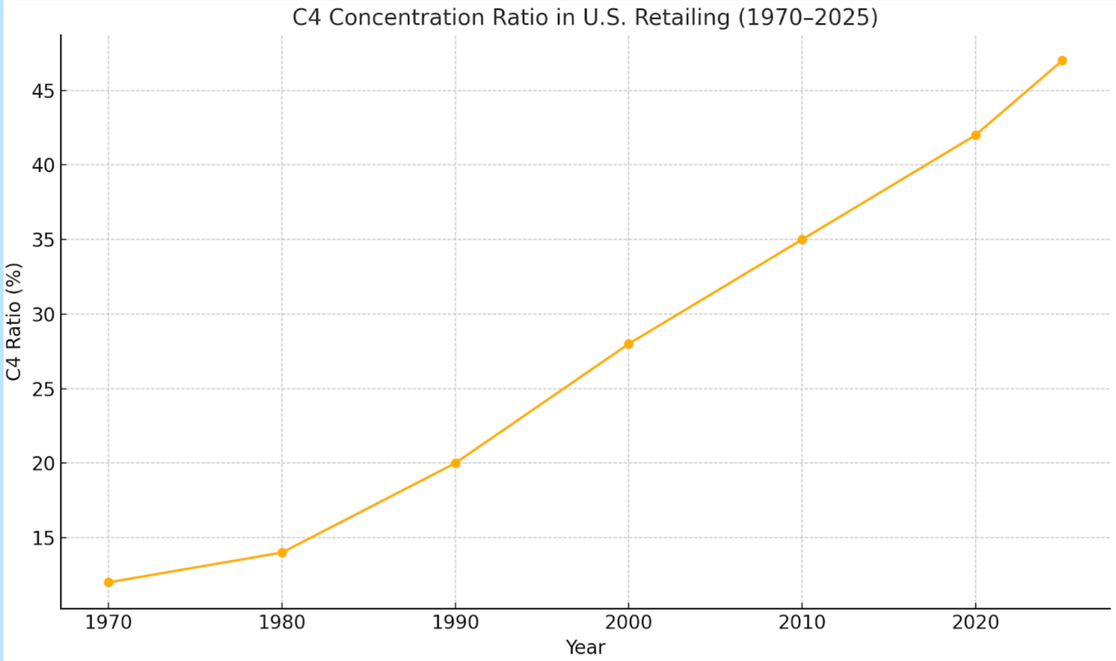


C4 Concentration Ratio in Retailing on the Rise

Source: Institute for Local Self Reliance

Early empirical evidence #1.

Rising concentration – especially in retail, finance, and utilities.



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Early empirical evidence #2.

Increases in centralized organizations – franchising, roll-ups, AI-native start ups.

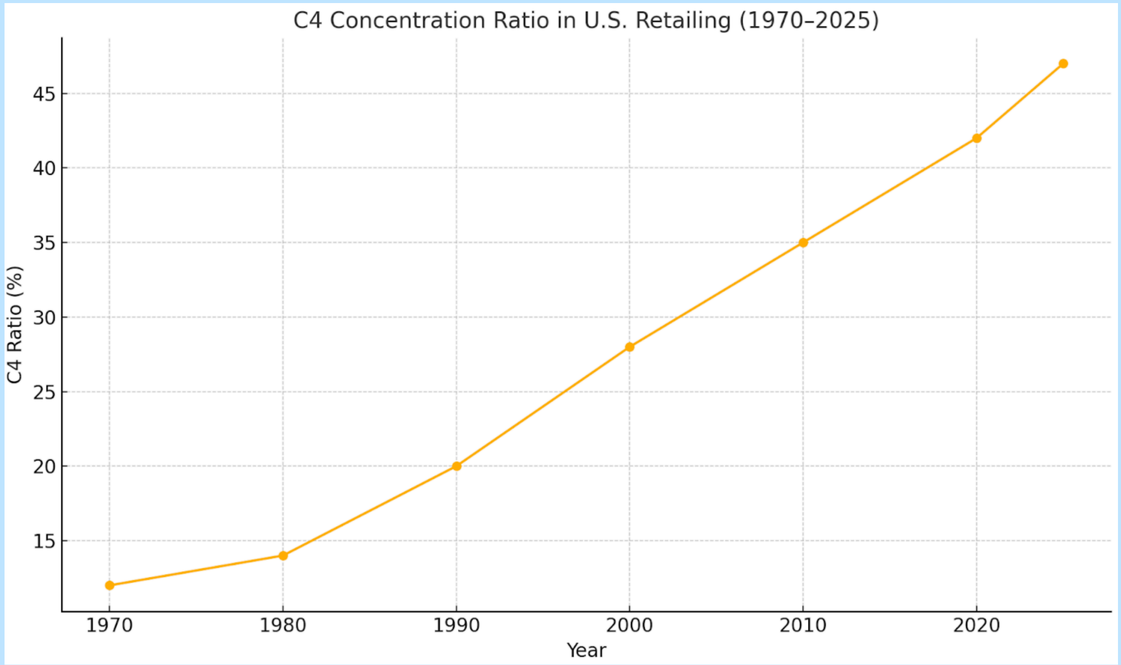
Top Lean AI Native Companies Leaderboard OFFICIAL

LeanAILeaderboard.com - Top Lean AI Native Companies Leaderboard : Official

.	.	Company	Description	Location	Annual Revenue	# of Employe	Revenue/Empl
1		Telegram	Messaging	Dubai	$1,000,000,000	30	$33,333,333
2		Midjourney	Image Generation	San Francisco	$500,000,000	40	$12,500,000
3		SurgeAI	AI Training Data	San Francisco	$1,000,000,000	110	$9,090,909
4		Anysphere (Cursor)	AI Code Editor	San Francisco	$100,000,000	20	$5,000,000
5		Base44	AI Code Gen	Tel Aviv	$3,500,000	1	$3,500,000
6		Cal AI	AI Calorie Tracker	New York	$12,000,000	4	$3,000,000
7		Mercor	Talent Marketplace + Data	San Francisco	$75,000,000	30	$2,500,000
8		Chai Research	Social AI Platform	Palo Alto	$30,000,000	12	$2,500,000
9		Fal.ai	Generative media platform	San Francisco	$95,000,000	40	$2,375,000
10		Eleven Labs	AI Voice, Text-to-Speech	New York	$100,000,000	50	$2,000,000
11		Stackblitz (Bolt.new)	AI Code Editor	San Francisco	$40,000,000	20	$2,000,000
12		OpenArt	AI for Image and Video	San Francisco	$20,000,000	10	$2,000,000
13		Lovable	AI Code Gen	Stockholm	$75,000,000	40	$1,875,000
14		Gamma	AI for Presentations	San Francisco	$50,000,000	28	$1,785,714

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C4 Concentration Ratio in Retailing on the Rise

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Early empirical evidence #2.

Increases in centralized organizations – franchising, roll-ups, AI-native start ups.

Instead of creating specialist silos, we hire versatile generalists who can solve problems across domains

— When our growth PM needed better analytics, he didn't file a ticket with a data team—he built a self-serve system that anyone can use without SQL knowledge.

— When our marketing lead needed to understand our customers better, she fed thousands of interactions into an LLM and created actionable personas that now guide our entire strategy.

Gamma AI Co-Founder on AI-Native Strategy

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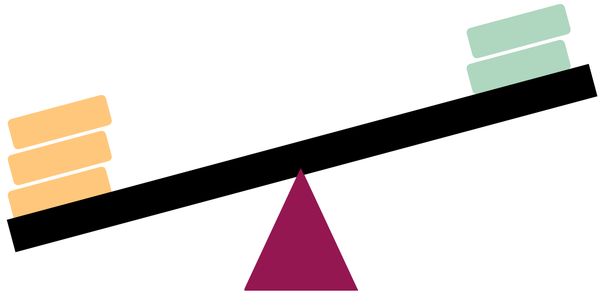
Political implication #1. Economic power begets political power.

- Via lobbying the government.
- Via control over the media and information landscape.
- Via decreased bargaining power of labor unions.

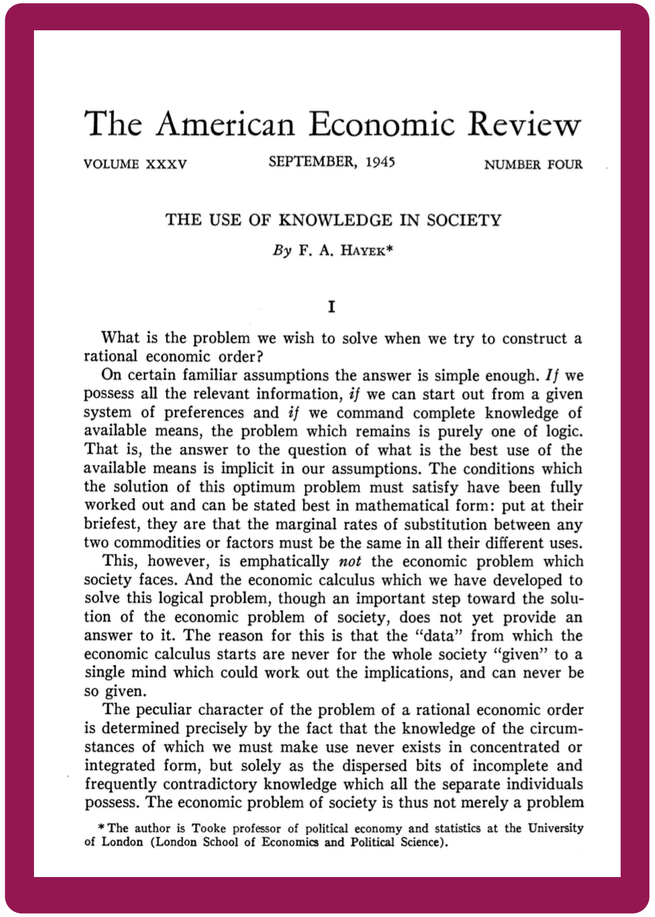
Political implication #2. Decreased incentive to invest in human capital.

- Large change in asset valuations in history - hundreds of trillions of dollars.
- Self-reinforcing cycle of centralization and reduced human capital.
- Democracy is undermined without an educated public.

We revisit a key tension…



Decentralization Centralization



The American Economic Review

VOLUME XXXV SEPTEMBER, 1945 NUMBER FOUR

THE USE OF KNOWLEDGE IN SOCIETY

By F. A. HAYEK*

I

What is the problem we wish to solve when we try to construct a rational economic order?

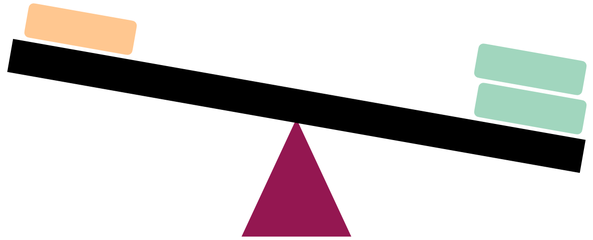
On certain familiar assumptions the answer is simple enough. *If* we possess all the relevant information, *if* we can start out from a given system of preferences and *if* we command complete knowledge of available means, the problem which remains is purely one of logic. That is, the answer to the question of what is the best use of the available means is implicit in our assumptions. The conditions which the solution of this optimum problem must satisfy have been fully worked out and can be stated best in mathematical form: put at their briefest, they are that the marginal rates of substitution between any two commodities or factors must be the same in all their different uses.

This, however, is emphatically *not* the economic problem which society faces. And the economic calculus which we have developed to solve this logical problem, though an important step toward the solution of the economic problem of society, does not yet provide an answer to it. The reason for this is that the "data" from which the economic calculus starts are never for the whole society "given" to a single mind which could work out the implications, and can never be so given.

The peculiar character of the problem of a rational economic order is determined precisely by the fact that the knowledge of the circumstances of which we must make use never exists in concentrated or integrated form, but solely as the dispersed bits of incomplete and frequently contradictory knowledge which all the separate individuals possess. The economic problem of society is thus not merely a problem

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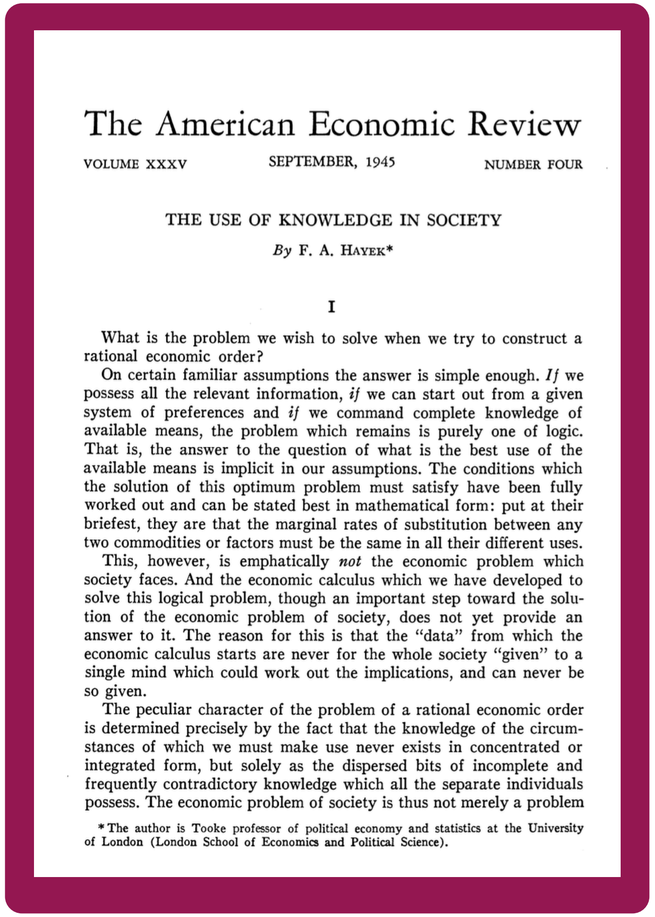


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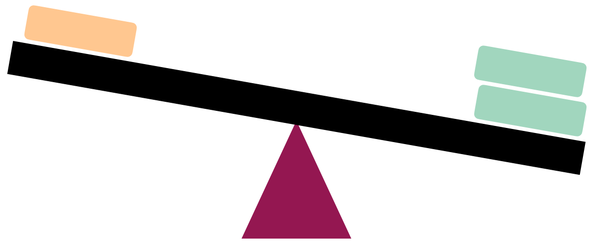
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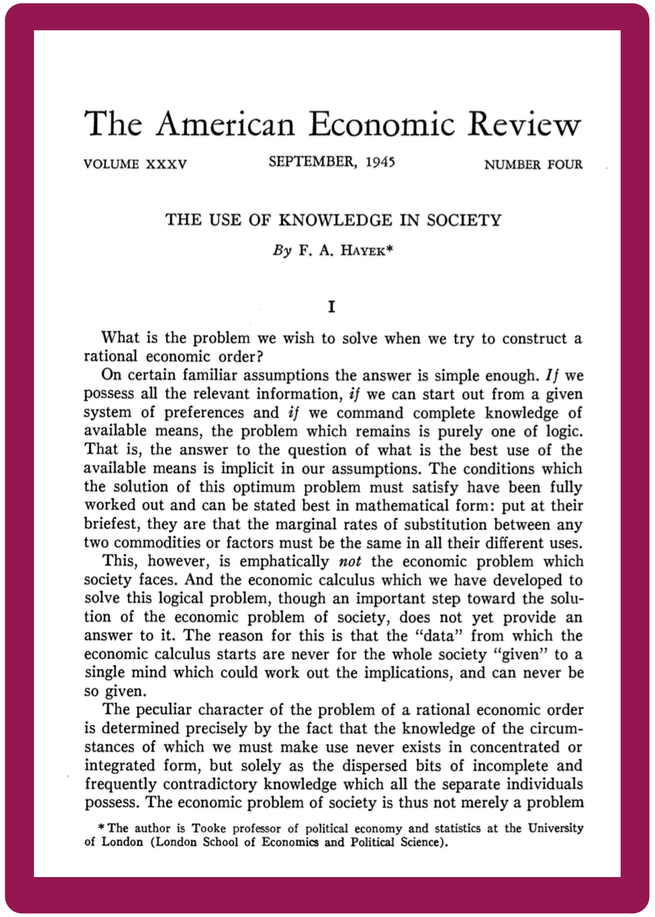


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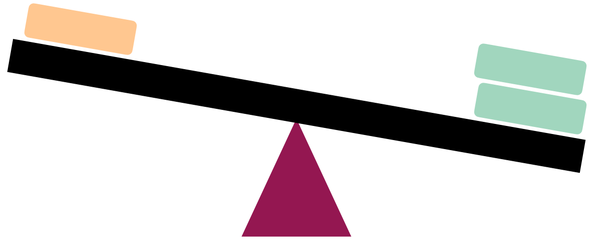
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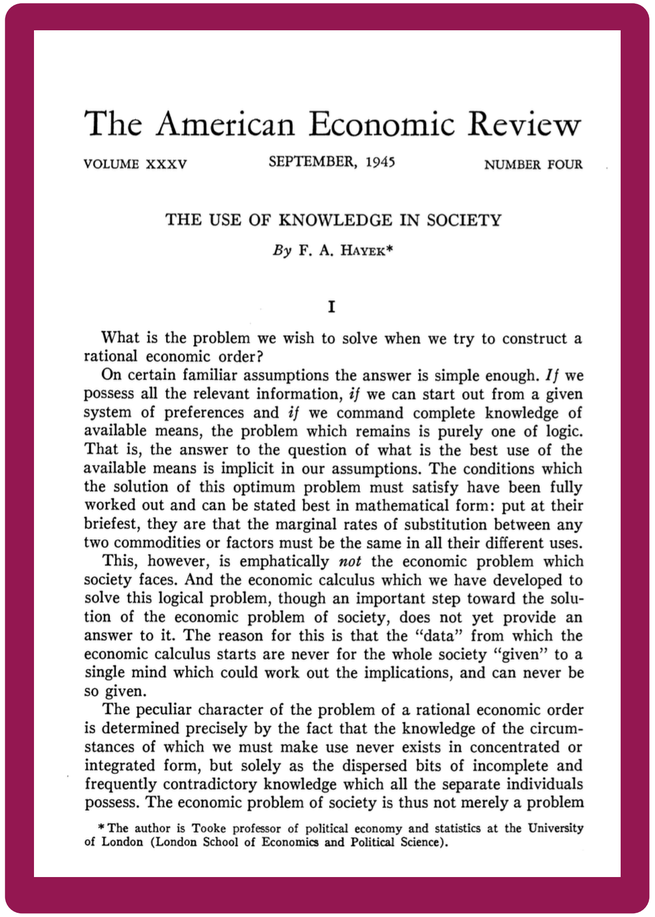


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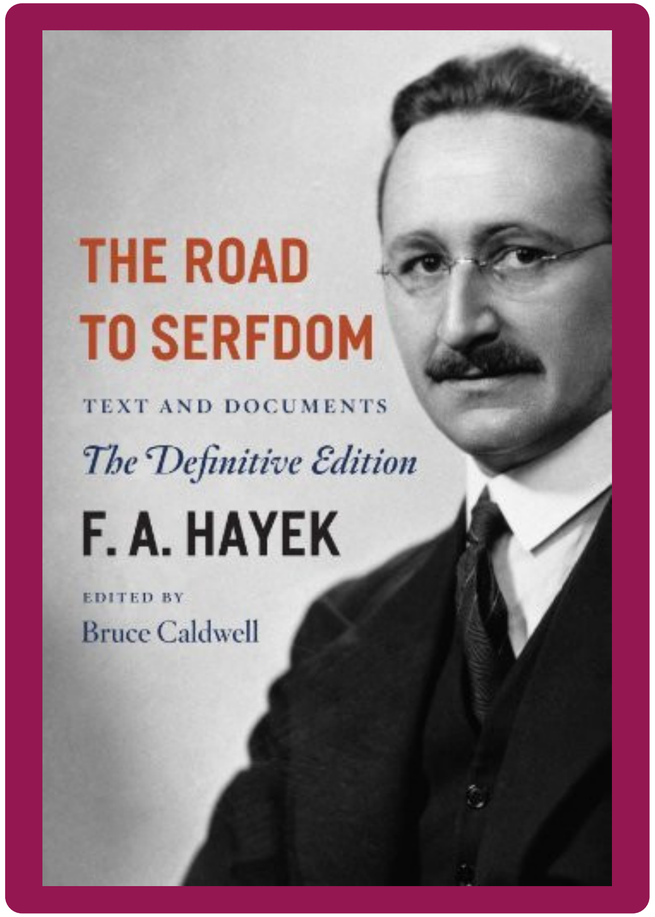
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as well as a political one.

DISCUSSANT!