The Collapse of Scarcity Economics

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Abstract

Traditional economic frameworks assume scarcity-constrained equilibrium, wherein capital, labor, and resources interact within finite boundaries. Artificial intelligence and robotics introduce production functions that decouple growth from labor constraints, thus fundamentally challenging this foundational assumption. Building on the author's prior work, this Article argues that the convergence of AI-driven automation, zero-marginal-cost production, and exponential scaling renders obsolete not merely individual occupations but the institutional architectures that depend upon scarcity as an organizing principle. The Article systematically demonstrates how the core propositions of neoclassical, behavioral, information-theoretic, general-equilibrium, and New Institutional economics expire in the face of computational abundance. It develops a theoretical framework for understanding abundance as a structural economic condition and proposes that the emerging economy requires governance mechanisms designed for what the author has elsewhere termed Computative Economics—economic science explicitly designed for a world in which intelligence is abundant, perfect, and self-improving.

Keywords: artificial intelligence; post-scarcity economics; abundance economics; zero marginal cost; Coasean Singularity; Agentic Decoupling; Computative Economics; decentralized autonomous organizations; blockchain governance; reputation systems; dynamic regulation; agency costs; corporate governance; tokenomics; labor displacement; GDP measurement; institutional obsolescence; principal-agent theory; neoclassical economics; bounded rationality; information economics; general equilibrium; New Institutional Economics

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A. The Supersonic Metaphor and Its Analytical Precision

Elon Musk's warning that artificial intelligence and robotics will arrive "like a supersonic tsunami" describes something that prevailing economic models cannot process: production functions that decouple growth from labor constraints.[2] The metaphor is precise in a way that warrants analytical attention. A supersonic wave outruns the signals that would normally warn of its approach. Institutions in linear systems that depend on advance warning—price signals, employment data, and GDP reports—cannot detect a transformation that propagates faster than the information systems designed to monitor it. Traditional frameworks assume scarcity-constrained equilibrium, where capital, labor, and resources interact within finite boundaries. This assumption has governed economic theory since Smith, Ricardo, and the marginalists. Yet AI and robotics introduce production that operates outside these constraints entirely. As I have argued in my analysis of the AI-to-AI economy, this transformation constitutes the deepest rupture in economic ontology since the marginalist revolution of the 1870s.[3]

The implications are foundational. We are witnessing the emergence of post-scarcity value mechanisms where supply becomes unbounded relative to demand.[4] This is not cyclical productivity improvement of the sort that orthodox growth theory contemplates. It is structural transformation. A discontinuity in the production function itself. The mathematics are unforgiving: production compounds exponentially while money supply grows linearly. Central banks inject liquidity on schedules calibrated for scarcity economies—quarterly adjustments, annual targets, multi-year policy frameworks. Against AI production scaling, these instruments become ceremonial. The Federal Reserve's toolkit assumes constrained labor and limited output.

[2] Elon Musk, interview by Joe Rogan, The Joe Rogan Experience, Episode 2219 (November 2025). See also Elon Musk (@elonmusk), "AI is a supersonic tsunami," X (formerly Twitter), January 21, 2026.
[3] Wulf A. Kaal, "The AI-to-AI Economy and the Collapse of Anthropocentric Economic Theory" (December 8, 2025), https://ssrn.com/abstract=5886341 [hereinafter Kaal, AI2AI Economy].
[4] Wulf A. Kaal, "Quantum Economy and Tokenomics," U. St. Thomas (Minn.) Legal Studies Research Paper No. 24-19 (July 21, 2024), https://ssrn.com/abstract=4900878.

It cannot process productivity sustaining permanent double-digit expansion because its models never included that variable.[5]

B. Agentic Decoupling as Ontological Break

What distinguishes this moment from all prior technological transitions is what I have termed Agentic Decoupling: the progressive severance of value creation from human labor and consumption.[6] Previous automation waves, including but not limited to the steam engine, electrification, the internet, etc., merely accelerated human-directed activity within existing institutional frames. The AI2AI economy constitutes an ontological break in which computation and electricity become the sovereign medium of exchange. Autonomous agents equipped with unbounded computational rationality, instantaneous information symmetry, and near-zero marginal costs of digital replication operate free from the cognitive, emotional, and temporal constraints that have defined economic agency since the inception of the discipline.[7][8]

The concept of Agentic Decoupling must be distinguished from earlier forms of labor displacement. When the power loom displaced hand weavers, the production function changed but the fundamental relationship between labor, capital, and output persisted. When spreadsheet software displaced bookkeepers, human cognitive labor was automated within occupational categories but the coordination architecture, including firms, employment contracts, and hierarchical management, remained intact. Agentic Decoupling severs the connection between value creation and human participation at the architectural level. Autonomous agents reinvest their own outputs, such as new models, improved code, and refined datasets, back into the network. Thus, creating self-reinforcing growth loops that require no exogenous injection of scarce land, labor, or physical capital.[9] The agentic economy does not merely automate human tasks. It generates an autonomous layer of economic activity in which humans are neither necessary producers nor, for an expanding class of intermediate goods, necessary consumers.

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[5]Wulf A. Kaal, "Quantum Economy and the Future of Work," U. St. Thomas (Minn.) Legal Studies Research Paper No. 24-18 (July 21, 2024), https://ssrn.com/abstract=4900880.
[6]Kaal, AI2AI Economy, at 4. I introduce the concept of "Agentic" to describe the progressive severance of value creation from human labor and consumption.
[7]Ke Yang and ChengXiang Zhai, "Ten Principles of AI Agent Economics," preprint, arXiv:2505.20273 (May 26, 2025).
[8]Luciano Floridi, "AI as Agency Without Intelligence: On ChatGPT, Large Language Models, and Other Generative Models," Philosophy & Technology 36, no. 1 (2023): 1–12.
[9]Ray Kurzweil, "The Law of Accelerating Returns" (March 7, 2001). See also Kaal, AI2AI Economy, at 4.

A critical objection must be addressed here. If humans are neither producers nor consumers in the agentic economy, what motivates the actions of the agents? The answer is precisely that humans remain the ultimate consumers of AI-generated value. But, the relationship is structurally transformed. In the current and near-term economy, AI agents act as instrumental extensions of human preferences. Thus, operating within objective functions that are ultimately calibrated to human utility. The distinction is between immediate consumption, where humans directly participate in each transaction. And terminal consumption, where human welfare remains the telos of production but where the intermediate production-consumption-reinvestment cycles among agents proceed autonomously. A pharmaceutical AI that designs, tests, and optimizes drug candidates through thousands of agent-to-agent transactions before a human patient ever benefits is still, in the final analysis, serving human consumption. But the vast majority of transactions in the production chain are AI-to-AI, generating a self-sustaining economic layer that operates independently of real-time human participation. The analytical point is not that human consumption disappears but that it ceases to be the proximate driver of the dominant mode of production. This distinction between terminal and proximate consumption is essential for understanding why traditional demand-side economics, which assumes that human consumption decisions directly drive production decisions at each margin, loses its descriptive accuracy in the agentic layer.

C. Speed as the Distinguishing Variable

Institutional frameworks regularly face obsolescence when technology outruns their foundational assumptions.[10] Schumpeter's theory of creative destruction anticipated the general dynamic, but even Schumpeter assumed the survival of the capitalist institutional envelope within which destruction and creation occurred.[11]

The difference now is speed: previous transitions unfolded across generations. This transition unfolds across quarters. The printing press took centuries to restructure European knowledge institutions. Electrification required decades to transform manufacturing. The internet reshaped information distribution over roughly twenty years. AI-driven abundance is compressing comparable institutional disruption into single-digit years. The institutional lag, that

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[10] Wulf A. Kaal, "Decentralization – Past, Present, and Future," in Festschrift in Honor of Andreas Schwartze (Jan Sramek Verlag, 2021), https://ssrn.com/abstract=3411897.
[11] Joseph A. Schumpeter, Capitalism, Socialism, and Democracy (New York: Harper & Brothers, 1942), 81–86.

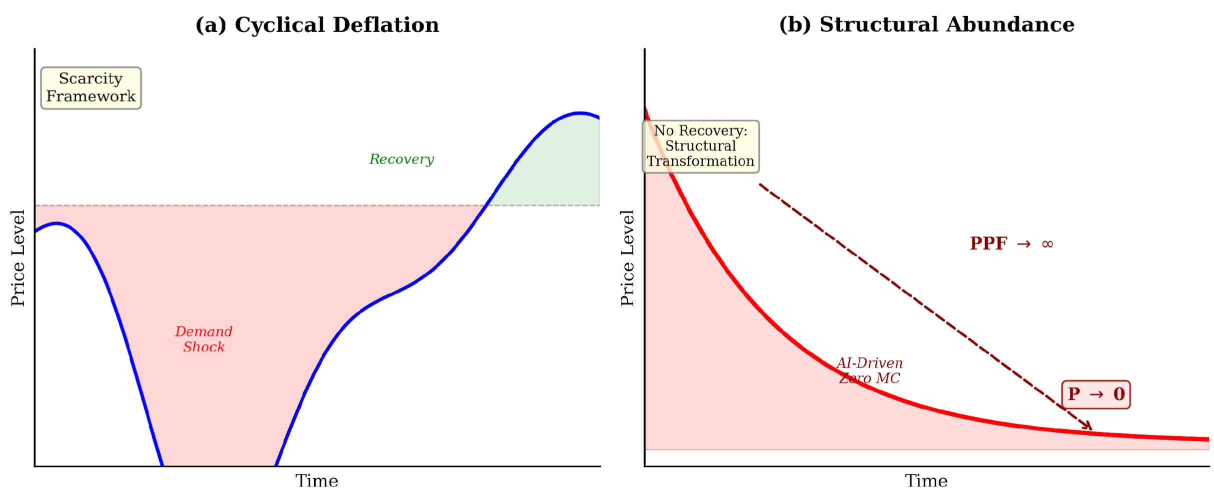
is, the gap between technological capability and governance capacity, is not merely widening. The institutional lag is approaching a structural singularity in which governance instruments designed for the previous era cannot meaningfully constrain or direct the forces operating in the new one.

II. The Mechanics of Abundance: Why Zero Marginal Cost Is Not Deflation

A. Structural Abundance vs. Cyclical Deflation

Price collapse under abundance operates differently than cyclical deflation, and the distinction is not merely semantic. It is structural. Conventional deflation reflects demand contraction or supply shocks within scarcity frameworks. The price “implosion” that AI-driven production generates reflects production possibility frontiers shifting toward infinity. The neoclassical scarcity postulate, formalized by Robbins as the ontological axiom that makes economics possible as a distinct discipline, dissolves in the agentic substrate.[12] When the primary inputs into value creation—such as intelligence, algorithms, software, predictive models, creative output, and coordination services—become computationally post-scarce, the transcendental condition of the entire neoclassical research program disappears.[13]

Figure 1: Price Collapse Under Abundance vs. Cyclical Deflation



[12] Lionel Robbins, An Essay on the Nature and Significance of Economic Science, 2nd ed. (London: Macmillan, 1935), at 16.
[13] Kaal, AI2AI Economy, at 10.

Figure 1. Price Collapse Under Abundance vs. Cyclical Deflation. This side-by-side comparison shows how traditional deflation is cyclical and tied to scarcity shocks, while AI abundance creates a structural, one-way implosion as production frontiers expand without limit.

Marshall's partial equilibrium framework, the supply-and-demand cross that remains the most widely taught analytical tool in economics, derives its shape from resource finitude.[14] The upward-sloping supply curve assumes that additional output requires additional scarce inputs at increasing marginal cost. The downward-sloping demand curve assumes that consumers face budget constraints rooted in finite income. When marginal cost approaches zero for the dominant inputs of the knowledge economy, the Marshallian cross loses its analytical purchase. Samuelson and Nordhaus's canonical textbook treatment of choice under constraint, production-possibility frontiers, and opportunity cost all presuppose finite factor endowments.[15] In the AI2AI economy, these endowments, at least for cognitive and digital goods, cease to bind.

[14]Alfred Marshall, Principles of Economics, 8th ed. (London: Macmillan, 1920).
[15]Paul A. Samuelson and William D. Nordhaus, Economics, 19th ed. (New York: McGraw-Hill, 2010).

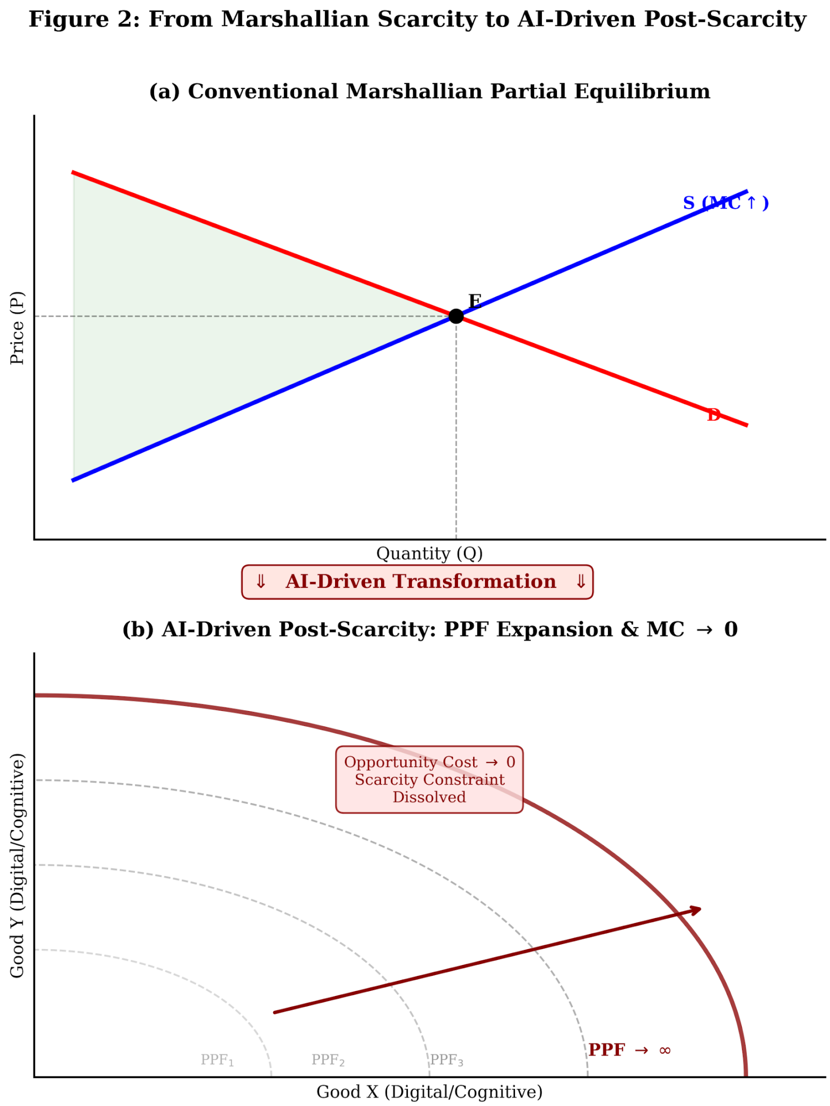


Figure 2. From Marshallian Scarcity to AI-Driven Post-Scarcity. The upper panel shows the conventional Marshallian partial equilibrium with upward-sloping supply (rising marginal cost) intersecting downward-sloping demand. The lower panel depicts the transformation when marginal cost approaches zero: the production-possibility frontier expands dramatically outward, opportunity cost collapses, and the binding scarcity constraint dissolves.

B. The Dissolution of Opportunity Cost

Understanding this distinction requires abandoning monetary metrics designed for limited output. My analysis of the top one hundred token models revealed how scarcity-based value models fail when alternative incentive structures emerge.[16] Fair token launch mechanisms

[16] Wulf A. Kaal, “Crypto Economics – The Top 100 Token Models Compared,” Banking & Financial Services Policy Report 37, no. 12 (2018): 19, https://ssrn.com/abstract=3249860.

address how to distribute value when incumbent allocation mechanisms, such as wages, dividends, and rents, become technically obsolete.[17]

Opportunity cost, the conceptual cornerstone of neoclassical rationality since Robbins, approaches zero across an ever-widening domain of economic activity. When an additional unit of sophisticated intelligence costs essentially nothing to produce and can be replicated instantaneously, the classic trade-off logic dissolves. The upward-sloping supply curve for knowledge work disappears. The price mechanism, which neoclassical theory celebrates as the elegant solution to the allocation problem under scarcity, becomes increasingly irrelevant for the dominant factors of production. This is not simply a case of technological progress shifting the production-possibility frontier outward, as occurred with steam, electricity, or the internet. Those earlier shifts expanded the feasible set while preserving scarcity as the defining condition. The AI2AI economy removes scarcity as the defining condition for the very inputs that are becoming the primary drivers of value creation.

C. Endogenous Value Compounding in Agentic Networks

Rifkin anticipated elements of this trajectory in his analysis of zero-marginal-cost production and the eclipse of capitalism. But, Rifkin's framework focused on the Internet of Things rather than AI-driven cognitive automation.[18] Lemley has identified the same structural dynamic from the vantage point of intellectual property law, arguing that IP has functioned as a mechanism for preserving scarcity in a world that no longer demands it.[19] The monetary stability frameworks we inherited assume supply constraints. As Calcaterra, Rao, and I demonstrated, maintaining price stability requires rethinking the relationship between supply growth and value preservation when production constraints disappear.[20]

More radically, value in the AI2AI economy compounds endogenously. Agents reinvest their own outputs back into the network, creating self-reinforcing growth loops that operate independent of human economic activity. Large language models function as integrative

[17] Wulf A. Kaal, "Fair Token Launch," U. St. Thomas (Minn.) Legal Studies Research Paper No. 22-19 (January 23, 2022), https://ssrn.com/abstract=4015908.
[18] Jeremy Rifkin, The Zero Marginal Cost Society: The Internet of Things, the Collaborative Commons, and the Eclipse of Capitalism (New York: Palgrave Macmillan, 2014).
[19] Mark A. Lemley, "IP in a World Without Scarcity," New York University Law Review 90, no. 2 (2015): 460–515.
[20] Craig Calcaterra, Wulf A. Kaal, and Vadhi Rao, "Stable Cryptocurrencies – First Order Principles," Stanford Journal of Blockchain Law & Policy 2, no. 1 (2019), https://ssrn.com/abstract=3402701.

substrates. LLMs are the "connective tissue" that enables modular, LEGO-like interoperability among specialized narrow AIs. As such, LLMs instantiate real-time Walrasian general equilibria without informational asymmetries or temporal latencies.[21] The result is a confederated intelligence capable of proactive, goal-directed behavior in recursive production-consumption-reinvestment cycles that continuously compound value endogenously within the machine layer itself.[22]

D. The Binding-Constraint Cascade: Electricity, Compute, and the Risk of Scarcity Reorientation

A fundamental objection to the abundance thesis deserves direct confrontation. In constrained optimization, when one constraint is relaxed, the next binding constraint determines the allocative outcome.[23] If intelligence becomes post-scarce, the binding constraints migrate to the physical inputs that sustain it: electricity, semiconductor fabrication, rare-earth minerals, cooling water, and the compute infrastructure that converts these material inputs into cognitive output. The International Energy Agency projects that global data-center electricity consumption will more than double between 2024 and 2030, reaching approximately 945 terawatt-hours. That is equivalent to Japan's entire current electricity demand.[24] RAND Corporation research documents that total AI data-center power demand reached approximately 21 GW in 2025, a fourfold increase from 2020 levels, and that the United States already faces increasing difficulty in securing sufficient grid capacity for rapid data-center construction.[25] These are not trivial constraints. They are material, physical, and deeply embedded in legacy infrastructure.

The risk, therefore, is not that abundance fails to materialize but that traditional scarcity economics reasserts itself at a different layer of the production stack. If a handful of hyperscale

[21] Léon Walras, Elements of Pure Economics, trans. William Jaffé (London: Allen & Unwin, 1954; original 1896).
[22] Fasheng Xu et al., "Generative AI and Organizational Structure in the Knowledge Economy," arXiv:2506.00532 (May 30, 2025); Ivan Ivanov, "AI2AI Marketing: Foundations and Research Agenda," Robonomics: Journal of the Automated Economy 3 (2022): 1–16.
[23] This is a standard insight from constrained optimization theory. See e.g., Andreu Mas-Colell, Michael D. Whinston, and Jerry R. Green, Microeconomic Theory (New York: Oxford University Press, 1995), ch. 5 (demonstrating that when one constraint is relaxed in a Lagrangian framework, the next binding constraint determines the shadow price and allocative outcome).
[24] International Energy Agency, Energy and AI: Preparing for the Next Decade (Paris: IEA, 2025). The IEA projects global data-center electricity consumption could more than double between 2024 and 2030, reaching 945 TWh by decade's end—equivalent to Japan's total current electricity demand.
[25] Konstantin F. Pilz, Yusuf Mahmood, and Lennart Heim, "AI's Power Requirements," RAND Corporation Research Report RRA3572-1 (2025). The authors document that total AI data-center power demand reached approximately 21 GW in 2025, a fourfold increase from 2020 levels.

firms control the electricity contracts, the GPU supply chains, and the data-center locations that constitute the physical substrate of AI production, then the collapse of cognitive scarcity merely concentrates extractive power in whoever controls the compute bottleneck. The result would be a new form of digital feudalism in which abundance accrues to the lords of the compute substrate while the rest of the economy remains subject to artificial scarcity imposed through infrastructure gatekeeping. Eight hyperscalers alone expected a 44% year-over-year increase in AI infrastructure spending to $371 billion in 2025.[26] Goldman Sachs projects global data-center power demand growth of 175% by 2030 versus 2023 levels.[27] Data-center firms requested 40.2 GW of power connections from a single utility, Dominion Energy Virginia, by February 2025, nearly doubling from 21.4 GW just seven months earlier.[28]

This objection is serious, and it counsels against naïve utopianism. But it does not refute the abundance thesis. Rather, it identifies the institutional design challenge that abundance creates. The appropriate response is rigorous decentralization of the compute and energy infrastructure that underpins AI production. Several pathways are available. First, decentralized compute networks, including blockchain-based protocols that coordinate distributed GPU resources, can break the hyperscaler oligopoly by enabling permissionless participation in the compute market. Second, energy decentralization through distributed generation, micro-nuclear reactors, and behind-the-meter solutions can reduce dependence on centralized grid infrastructure. Third, open-source AI models, which are already demonstrating competitive performance against proprietary frontier LLM systems, can ensure that the intelligence layer remains non-rivalrous even if the physical substrate remains scarce. Fourth, antitrust enforcement and structural regulation of compute markets can prevent the kind of vertical integration that would enable infrastructure owners to reimpose scarcity artificially. The policy implication is clear: the transition from scarcity to abundance is not automatic. It requires deliberate institutional intervention to prevent scarcity from migrating rather than dissolving. But the fact that the binding constraint can shift does not mean that abundance in the cognitive layer

[26]Deloitte Insights, "Can US Infrastructure Keep Up with the AI Economy?" (December 2025) (documenting that eight hyperscalers expect a 44% year-over-year increase to $371 billion in 2025 AI infrastructure spending).
[27]Goldman Sachs Research, "AI/Data Center Power Demand: The 6 Ps Driving Growth" (October 2025) (projecting global data-center power demand growth of 175% by 2030 versus 2023 levels).
[28]See, e.g., S&P Global, "Global AI Power Demand: Challenges and Opportunities" (December 2025) (reporting that data-center firms requested 40.2 GW of power connections from Dominion Energy Virginia alone by February 2025, up from 21.4 GW in July 2024).

is illusory. It means that the governance challenge has moved from allocating scarce intelligence to ensuring open access to the physical infrastructure that makes abundant intelligence possible.

III. The Collapse of Neoclassical Economics: Scarcity as Expired Axiom

A. Robbins's Ontological Postulate and Its Expiration

Neoclassical economics is not merely one economic school among many. It is the foundational paradigm that has structured economic inquiry for 150 years. Its point of departure is Robbins's celebrated definition: economics is "the science which studies human behaviour as a relationship between ends and scarce means which have alternative uses."[29] Scarcity is not presented as an empirical regularity that happens to hold under current technological conditions. It is elevated to an ontological axiom. That is, the very condition that makes choice meaningful and therefore makes economics possible as a distinct discipline. From this single axiom flow the entire analytical apparatus of neoclassical theory: choice under constraint generates opportunity cost. Scarcity of factors produces the production-possibility frontier, the supply curve, and the demand curve that together determine equilibrium prices. The price mechanism becomes the universal coordinator reconciling unlimited desires with limited resources.[30]

The AI2AI economy directly assaults this price mechanism. In an agentic world, the primary inputs into value creation, such as intelligence, algorithms, software, predictive models, creative output, and complex coordination services, become computationally abundant. Exponential improvement in compute efficiency, combined with recursive self-improvement of AI systems, drives the marginal cost of additional intelligence and digital goods toward zero.[31] The production-possibility frontier for cognitive and digital goods ceases to be a binding constraint. It effectively flattens toward infinity as replication and optimization become free.[32]

B. The Production-Possibility Frontier Approaches Infinity

When the ontological foundation of a discipline disappears, the discipline itself loses its traditional subject matter. Neoclassical economics does not merely become less applicable. As I have argued, it becomes a historical science of coordination under conditions of biological and

[29] Robbins, *An Essay on the Nature and Significance of Economic Science*, 16.
[30] Friedrich A. Hayek, "The Use of Knowledge in Society," American Economic Review 35, no. 4 (1945): 519–30.
[31] Kaal, AI2AI Economy, at 10. See also Kurzweil, "The Law of Accelerating Returns."
[32] Kaal, AI2AI Economy, at 10.

physical scarcity. Conditions that no longer apply in the agentic layer of the economy.[33] The apparatus of constrained maximization, marginal analysis, and price-mediated allocation retains descriptive power only for the shrinking sphere of materially scarce goods, rare-earth metals, energy, human attention. For the expanding sphere of post-scarce cognitive production, it is simply inapposite.

The implications cascade through every subfield built on the scarcity axiom. Welfare theorems assume that efficient allocation requires price signals derived from scarcity. Growth accounting attributes output changes to capital, labor, and total factor productivity. All defined relative to finite inputs. Cost-benefit analysis compares scarce resources across alternative uses. Public economics justifies taxation and redistribution on the premise that resources are limited and must be allocated among competing claimants. Each of these analytical tools loses its foundation when the dominant inputs into production are self-replicating, self-improving, and essentially costless.[34]

C. The Price Mechanism Loses Its Object

Marshall's elegant framework of partial equilibrium, defined as the intersection of supply and demand that determines price and quantity in individual markets, presupposes that producers face rising marginal costs and consumers face binding budget constraints.[35] When AI strips out labor costs, eliminates production errors, and removes the inefficiencies that keep goods expensive, manufacturing approaches zero marginal cost while quality accelerates. The Marshallian cross does not merely shift. It loses its structural basis. Walras's general equilibrium, which extends the same logic across all markets simultaneously, faces the same dissolution.[36] Price signals, which neoclassical theory celebrates as the elegant solution to the allocation problem under scarcity, become increasingly irrelevant when the allocation problem itself ceases to exist for the dominant factors of production.

[33] Kaal, AI2AI Economy, at 36.
[34] See generally Paul A. Samuelson, Foundations of Economic Analysis (Cambridge, MA: Harvard University Press, 1947).
[35] Marshall, *Principles of Economics*.
[36] Walras, *Elements of Pure Economics*. See also Kenneth J. Arrow and Gérard Debreu, "Existence of an Equilibrium for a Competitive Economy," Econometrica 22, no. 3 (1954): 265–90.

Figure 3: The Dissolution of the Marshallian Cross in the Limit of Zero Marginal Cost

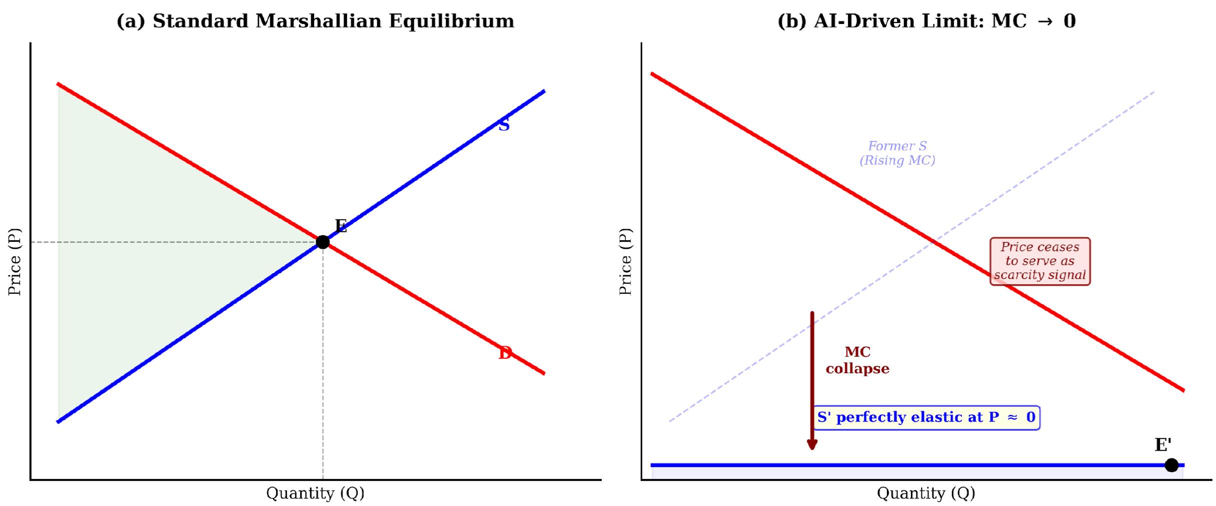


Figure 3. The Dissolution of the Marshallian Cross in the Limit of Zero Marginal Cost. Panel (a) shows standard Marshallian equilibrium. Panel (b) depicts the AI-driven limit where marginal costs approach zero, the supply curve becomes perfectly elastic at $P \approx 0$, and price ceases to serve as an informative scarcity signal.

D. Internet Content as Empirical Microcosm: The Supply Curve That Already Disappeared

The theoretical argument gains empirical support when we examine internet content as a microcosm in which the elimination of the upward-sloping supply curve has already occurred, and in which the consequences for production and consumption patterns are observable. Shapiro and Varian's foundational analysis of information economics identified the characteristic cost structure of digital goods: high first-copy costs and near-zero marginal reproduction costs.[37] Anderson extended this analysis to document how zero-marginal-cost digital distribution transformed media, software, and information markets, creating business models built on "free" as a price point rather than an anomaly.[38]

The internet content economy provides a twenty-five-year natural experiment in what happens when the supply curve for a major category of economic goods collapses. Several structural consequences have materialized that are directly relevant to the AI abundance thesis.

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[37] Carl Shapiro and Hal R. Varian, Information Rules: A Strategic Guide to the Network Economy (Boston: Harvard Business School Press, 1999). Shapiro and Varian's analysis of information goods—high first-copy costs, near-zero marginal reproduction costs—anticipated the cost structure that now characterizes AI-generated content.
[38] Chris Anderson, Free: The Future of a Radical Price (New York: Hyperion, 2009). Anderson documented how zero-marginal-cost digital distribution transformed media, software, and information markets.

First, the volume of production exploded beyond any prior forecasting model. More content is now produced in a single day than was produced in the entire pre-digital era. The supply curve did not merely flatten. It inverted the traditional relationship between production cost and output. Second, the value-capture mechanism shifted from per-unit pricing to attention economics. When the marginal cost of distribution is zero, the scarce resource becomes human attention rather than the information good itself, generating the attention economy that now dominates digital commerce. Third, incumbent institutions, such as newspapers, record labels, broadcast networks, publishing houses, experienced precisely the institutional obsolescence that this Article predicts for economic institutions more broadly. They did not merely lose market share. Their foundational business models, built on the assumption that distribution was scarce and costly, became structurally incoherent. Fourth, and most revealingly for the present analysis, the collapse of the supply curve did not produce the frictionless paradise that early internet optimists predicted. Instead, it generated new forms of concentration through platform intermediaries, such as Google, Meta, Amazon, that control not the content itself but the infrastructure for discovery and distribution. This last observation directly reinforces the binding-constraint analysis in Section II.D: when one form of scarcity disappears, economic power migrates to whoever controls the next binding constraint.

The internet content microcosm thus serves as both confirmation and cautionary tale. It confirms that zero-marginal-cost production fundamentally transforms economic structure in ways that scarcity-based models cannot accommodate. But it also demonstrates that abundance does not distribute itself equitably without institutional intervention. The AI abundance economy is poised to replicate these dynamics at vastly greater scale and across far more domains of economic activity. The lessons of the internet content revolution should inform the institutional design imperative that this Article identifies.

IV. The Collapse of Behavioral and Institutional Economics: Bounded Rationality Engineered Away

A. Simon's Satisficing and the End of Cognitive Scarcity

Herbert Simon's concept of bounded rationality demolished the fiction of homo economicus by demonstrating that cognitive capacity, computational ability, and information-processing time are themselves scarce resources.[39] Faced with complex, multidimensional decision spaces and radical uncertainty about future states, humans do not optimize. Instead, humans satisfice, searching only until a "good-enough" solution is found and then halting. This insight is not a minor behavioral footnote. It is a foundational rupture. Once bounded rationality is accepted, the entire neoclassical edifice, perfect foresight, continuous re-optimization, complete contingent-claims contracting, becomes descriptively untenable.

The AI2AI economy removes bounded rationality from the economic substrate entirely. Autonomous agents operate on effectively unbounded computational capacity: exascale datasets are processed in milliseconds, decision trees of astronomical branching factor are exhaustively searched, and optimization occurs across dimensions that no human mind can hold in working memory simultaneously.[40] Where human managers satisfice because further search is cognitively costly, AI2AI agents continue searching until the global optimum is reached because additional computation is essentially free. Where human contracts remain radically incomplete because the parties cannot specify responses to all future states, AI2AI agents generate, evaluate, and execute functionally complete contingent plans across vast state spaces in real time.[41]

B. Williamson's Authority Relation Without Cognitive Justification

Oliver Williamson carried Simon's insight into the heart of institutional theory. In transaction-cost economics, bounded rationality is one of the two core behavioral assumptions, the other being opportunism, that explain why firms exist and why governance structures vary.[42] When contracts are unavoidably incomplete because the parties cannot foresee or specify all future contingencies, and when continual renegotiation is cognitively impossible, hierarchical authority becomes a superior governance mode.[43]

The institutional implications of unbounded machine rationality are devastating for the behavioral-institutional research program. When perfect calculation is cheaper than delegation,

[39] Herbert A. Simon, Models of Man: Social and Rational (New York: Wiley, 1957).
[40] Enrique Ide and Eduard Talamàs, "Artificial Intelligence in the Knowledge Economy," preprint, arXiv:2312.05481 (December 9, 2023; revised May 17, 2025).
[41] See Oliver Hart and John Moore, "Incomplete Contracts and Renegotiation," Econometrica 56, no. 4 (1988): 755–85.
[42] Oliver E. Williamson, Markets and Hierarchies: Analysis and Antitrust Implications (New York: Free Press, 1975).
[43] Oliver E. Williamson, The Economic Institutions of Capitalism: Firms, Markets, Relational Contracting (New York: Free Press, 1985).

authority loses its cognitive rationale. When exhaustive optimization is cheaper than heuristic approximation, routines and standard operating procedures become obsolete. When hyper-rational agents can write and execute complete state-contingent contracts at negligible cost, the Williamsonian justification for hierarchical governance evaporates.[44] The firm, in the Coase-Williamson sense, was an institutional response to the scarcity of human cognition. In the AI2AI economy, cognition is no longer scarce.

C. Organizational Inertia as Historical Artifact

Bounded rationality also explains the ubiquity of routines, standard operating procedures, and organizational inertia. Phenomena that Cyert and March treated as rational responses to cognitive overload rather than as inefficiencies.[45] In my earlier work on dynamic regulation, I accepted bounded rationality as an immutable feature of human systems and designed feedback-driven institutions precisely to augment collective cognition without pretending we could ever eliminate its limits.[46] The AI2AI economy does not refine these adaptive mechanisms. It renders them historically contingent artifacts of human temporal limitation. The behavioral and early institutional justification for hierarchy, bureaucracy, and organizational inertia, that is, the need to economize on limited human rationality, becomes a historical curiosity. Bounded rationality was never merely a behavioral quirk. It was the ontological condition that made hierarchy, routines, and institutional inertia rational. When that condition is engineered away, the entire behavioral-institutional edifice loses its explanatory domain for the dominant mode of production.[47]

V. The Collapse of Information Economics: Asymmetry Becomes Architecturally Impossible

A. Akerlof's Lemons in a World of Perfect Verification

The revolutionary contribution of Akerlof, Stiglitz, and Spence in the 1970s was to demonstrate that when one party knows more than another, about product quality, effort levels,

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[44] Oliver E. Williamson, The Mechanisms of Governance (New York: Oxford University Press, 1996).
[45] Richard M. Cyert and James G. March, A Behavioral Theory of the Firm, 2nd ed. (Cambridge, MA: Blackwell, 1992; original 1963).
[46] Wulf A. Kaal, "Evolution of Law: Dynamic Regulation in a New Institutional Economics Framework," in Festschrift in Honor of Christian Kirchner (Tübingen: Mohr Siebeck, 2014), https://ssrn.com/abstract=2267560 [hereinafter Kaal, Evolution of Law].
[47] Kaal, AI2AI Economy, at 15.

risk type, or future intentions, markets systematically fail to achieve efficient outcomes. Akerlof's "Market for Lemons" showed that sellers' private knowledge of quality drives high-quality goods out of the market, potentially causing total market collapse.[48] Spence demonstrated that high-ability agents must engage in costly signaling to credibly reveal their type.[49] Stiglitz extended the analysis to moral hazard, screening, and credit rationing.[50]

In the AI2AI economy, this foundational premise is architecturally invalidated. Every inference, every parameter update, every decision trace, and every model weight in an autonomous agent is, by design, cryptographically attested, version-controlled, and auditable in real time across federated networks.[51] An AI agent selling computational services cannot misrepresent its capabilities because its training data, fine-tuning history, and inference logs are immutably recorded and instantly verifiable. Hidden action and hidden information are not merely reduced. They are rendered computationally impossible at the substrate level.[52]

B. Spence's Signaling Costs at Zero

The institutional consequences are sweeping. Costly signaling, such as via degrees, warranties, bonding, and credit scores, becomes redundant when direct verification is instantaneous and free. Screening mechanisms, certifications, audits, due diligence, lose their purpose when the underlying state of the world is public by default. Regulatory disclosure regimes designed to force revelation of private information become historical artifacts when privacy itself is no longer technically enforceable among agents. Spence's signaling equilibrium, which showed that even wasteful expenditures can be socially rational if they credibly separate types, loses its object entirely. When every agent's capability is directly and costlessly observable, the signaling game has no moves to make.[53]

C. Stiglitz's Regulatory Apparatus Without an Object

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[48] George A. Akerlof, "The Market for 'Lemons': Quality Uncertainty and the Market Mechanism," Quarterly Journal of Economics 84, no. 3 (1970): 488–500.
[49] A. Michael Spence, "Job Market Signaling," Quarterly Journal of Economics 87, no. 3 (1973): 355–74.
[50] Joseph E. Stiglitz, "The Contributions of the Economics of Information to Twentieth Century Economics," Quarterly Journal of Economics 115, no. 4 (2000): 1441–78.
[51] David Minarsch et al., "Autonomous Economic Agents as a Second Layer Technology for Blockchains," 2020 IEEE International Conference on Blockchain & Cryptocurrency (2020): 1–10.
[52] Kaal, AI2AI Economy, at 27.
[53] See Spence, "Job Market Signaling." See also Kaal, AI2AI Economy, at 27.

The policy implication of information economics was transformative: because perfect information is unattainable among human agents, optimal institutional design must accept second-best solutions (such as regulation, disclosure mandates, licensing, reputation mechanisms, and relational contracting) all aimed at reducing, but never eliminating, informational asymmetry. In the AI2AI economy, knowledge among agents is public and costless to verify. The entire second-best apparatus collapses. This is not because we have found better ways to approximate perfect information, but because perfect information has become the default architectural property of the economic substrate. Information economics was a rigorous demonstration that perfect markets are impossible among cognitively limited, strategically motivated human beings. When the economic actors are no longer cognitively limited or capable of strategic concealment, the impossibility theorem is overturned. Not by institutional ingenuity, but by engineering reality.[54]

D. The Hallucination Objection: Residual Imperfection and the Persistence of Signaling

The foregoing analysis of information economics' collapse requires qualification in light of a serious empirical objection: probabilistic AI systems hallucinate. While constantly improving, they generate confident assertions that are factually incorrect, fabricate citations, and produce plausible-sounding content that is substantively false. OpenAI itself has acknowledged that hallucinations are systemic byproducts of how probabilistic models are trained and evaluated, not merely bugs to be patched.[55] While leading probabilistic frontier models have achieved sub-1% hallucination rates for general knowledge queries, rates climb to 5–30% for specialized domains, and legal information hallucination rates average 6.4% even for top models.[56] If probabilistic AI agents cannot reliably distinguish truth from fabrication, then Akerlof's lemons problem and Spence's signaling games retain their relevance. Only now the asymmetry is between agents that can verify AI output and those that cannot.

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[54] Stiglitz, "Contributions of the Economics of Information to Twentieth Century Economics." See also Kaal, AI2AI Economy, at 27.

[55] Adam Tauman Kalai, Ofir Nachum, Santosh S. Vempala, and Edwin Zhang, "Why Language Models Hallucinate," preprint, arXiv:2509.04664 (September 4, 2025), https://openai.com/index/why-language-models-hallucinate/. The authors explain that hallucinations are systemic byproducts of how models are trained and evaluated, not merely bugs to be patched.

[56] See generally Markus Brinsa, "Hallucination Rates in 2025: Accuracy, Refusal, and Liability" (January 2026) (documenting that while four models achieved sub-1% hallucination rates for general knowledge, rates climb to 5–30% for specialized domains).

This objection has force, and it counsels against premature declarations of information economics' irrelevance. Three responses are warranted.

First, hallucination rates are declining rapidly and predictably, following trajectories consistent with the broader exponential improvement in probabilistic AI capabilities. The transition from 30% hallucination rates in early generative models to sub-1% in leading 2025 systems represents a structural improvement curve, not an asymptotic limit.

Second, and more fundamentally, the relevant comparison is not between perfect AI and imperfect AI but between imperfect probabilistic AI and imperfect humans. Human experts in specialized domains, such as law, medicine, and finance, also produce errors, but at rates that are difficult to benchmark because human error is not systematically logged and auditable in the way that AI inference is. The transparency of AI failure modes is itself a reduction in information asymmetry: we can measure and publish hallucination rates precisely because AI inference is auditable in ways that human cognition is not.

Third, the institutional response to hallucination, multi-model consensus, retrieval-augmented generation, cryptographic citation verification, human-in-the-loop validation, represents exactly the kind of hybrid verification infrastructure that my Web3 reputation systems are designed to provide.[57] Reputation and signaling do not disappear entirely. They evolve from proxies for unobservable quality to verification mechanisms for auditable but imperfect machine output.

Fourth, the hallucination problem is architecturally specific to purely probabilistic systems and dissolves under hybrid neuro-symbolic architectures that are already emerging as the dominant design pattern for high-stakes deployment. Probabilistic large language models hallucinate because they are trained to predict statistically likely token sequences, not to verify propositional truth. The error is intrinsic to the substrate: a model optimizing for distributional plausibility will inevitably generate outputs that are plausible but false, precisely because plausibility and truth are orthogonal properties in high-dimensional token space. But probabilistic inference is only one layer in a maturing computational stack. When probabilistic models are embedded within formal logical and symbolic AI systems, such as constraint solvers,

[57] Wulf A. Kaal, "AI Governance Via Web3 Reputation System," Stanford Journal of Blockchain Law & Policy (2024), https://ssrn.com/abstract=4941807.

theorem provers, ontological reasoners, and rule engines that enforce deductive consistency as a hard architectural constraint, the hallucination surface shrinks to the vanishing point. The probabilistic layer generates candidate outputs; the symbolic layer filters, validates, and rejects any output that violates formally specified rules, known ontological relations, or deductively verifiable constraints. The two substrates are not merely complementary. They are co-evolutionary: as probabilistic models improve their approximation of domain structure, the symbolic layer refines its rule base with greater granularity, and as the symbolic layer sharpens its constraints, the probabilistic layer receives increasingly precise feedback signals that further compress the residual hallucination rate. This convergence is not speculative. Retrieval-augmented generation already instantiates a primitive version of the architecture by grounding probabilistic output in verified external knowledge. Formal verification pipelines in code generation, where probabilistic models draft programs that are then validated against type-checkers, proof assistants, and test suites, demonstrate hallucination rates approaching zero for well-specified domains. The trajectory points toward a general-purpose hybrid architecture in which the probabilistic substrate handles creative generalization and the symbolic substrate enforces inferential discipline. Thus, reducing the hallucination rate not asymptotically toward some irreducible floor but structurally toward the epsilon bound set by the completeness of the formal rule base itself. At that convergence point, the hallucination objection ceases to identify a permanent limitation of artificial intelligence and reveals itself as a transitional artifact of an early, purely probabilistic design paradigm.

The hallucination objection thus refines rather than refutes the argument. Information economics does not collapse instantaneously and completely. It collapses progressively as verification infrastructure improves, as hallucination rates decline along predictable exponential improvement curves, and as hybrid neuro-symbolic architectures structurally eliminate the probabilistic substrate's capacity for confabulation. The residual role of signaling and reputation during this transitional period is real but diminishing. And, its diminishment is not merely empirical but architectural, driven by the convergence of probabilistic generalization and symbolic constraint enforcement into a unified computational stack that renders informational asymmetry technically unsustainable. The institutional architecture should be designed accordingly. Not to preserve legacy signaling mechanisms indefinitely, not to treat hallucination as a permanent feature of machine cognition that justifies perpetuating Spence's costly separating equilibria, but to build the verification infrastructure—multi-model consensus, formal logical validation, cryptographic attestation, and reputation-weighted knowledge graphs—that renders those mechanisms obsolete. As I have argued in the context of dynamic regulation, institutional design must track the trajectory of the technology it governs rather than the snapshot of its current limitations. The trajectory here is unambiguous: the hallucination objection identifies a transitional imperfection, not a structural boundary, and the institutional response must be calibrated to the convergence rather than the residuum.

VI. The Collapse of General Equilibrium Theory: From Heroic Assumption to Engineering Fact

A. Walras's Auctioneer Disappears

General equilibrium theory represents the crowning analytical achievement of neoclassical economics: the rigorous proof that a decentralized price system can, under highly stylized conditions, coordinate the actions of millions of agents to achieve Pareto-efficient allocation. Walras first proposed the possibility of simultaneous clearing of all markets through an iterative tâtonnement process overseen by a fictitious auctioneer.[58] Arrow and Debreu later supplied the existence proof by constructing a complete set of contingent-claims markets for every commodity in every state of nature.[59]

In the AI2AI economy, these heroic assumptions cease to be abstractions and become engineering facts. Autonomous agents, orchestrated by large language models and running on globally distributed compute, negotiate directly and simultaneously across all markets at machine speed. Price discovery is no longer a slow tâtonnement process requiring a central coordinator. It is a continuous, decentralized, latency-free computation executed by the agents themselves. The Walrasian auctioneer is replaced by the agents themselves performing the coordinating function in real time.[60]

B. Arrow-Debreu Completeness as Operational Reality

[58] Walras, *Elements of Pure Economics*.
[59] Kenneth J. Arrow and Gérard Debreu, "Existence of an Equilibrium for a Competitive Economy," Econometrica 22, no. 3 (1954): 265–90.
[60] Kaal, AI2AI Economy, at 19.

Where humans cannot specify contracts for every future state, AI2AI agents can generate, evaluate, and execute state-contingent agreements across astronomically large state spaces in real time, effectively creating complete markets endogenously.[61] The Arrow-Debreu state space is no longer a theoretical construct. It is an operational reality. Temporal persistence of disequilibria vanishes. Stochastic shocks are predicted, priced, and neutralized before they propagate because agents run millions of forward simulations per second and adjust positions instantaneously.[62] The Calvo pricing frictions and persistence parameters that dominate modern DSGE models become unnecessary when contracts and prices adjust continuously rather than in staggered human time.[63]

C. Nash's Equilibrium: From Anthropocentric Relic to Algorithmic Collusion Risk

Nash's foundational contribution to non-cooperative game theory introduced the Nash equilibrium as a mathematical formalism for strategic interdependence: a state in which no rational player can unilaterally improve their payoff, given the strategies of others.[64] While elegant and transformative, Nash's construct rests on anthropocentric assumptions: perfect rationality, complete information, instantaneous computation, and static interactions devoid of temporal frictions.[65]

The relationship between Nash equilibrium and AI agents is more complex than the prior version of this Article acknowledged. The critical question is whether AI agents, operating on behalf of human clients, will compete or collude. The emerging evidence suggests that Nash equilibrium not only persists in AI-mediated markets but may produce outcomes worse than those predicted by standard competitive models. Arunachaleswaran and colleagues have demonstrated that supra-competitive pricing can emerge as a Nash equilibrium of repeated pricing games even without explicitly encoded punishment strategies, suggesting that "the

[61] Arrow and Debreu, "Existence of an Equilibrium for a Competitive Economy." See also Kaal, AI2AI Economy, at 28.
[62] See generally John von Neumann and Oskar Morgenstern, Theory of Games and Economic Behavior (Princeton: Princeton University Press, 1944).
[63] Frank Smets and Rafael Wouters, "Shocks and Frictions in U.S. Business Cycles: A Bayesian DSGE Approach," American Economic Review 97, no. 3 (2007): 586–606.
[64] John F. Nash, "Non-Cooperative Games," Annals of Mathematics 54, no. 2 (1951): 286–95.
[65] Kaal, AI2AI Economy, at 20.

definition of algorithmic collusion may need to be expanded."[66] Fish and colleagues have provided experimental evidence that LLM-based pricing agents sustain supra-competitive prices in Bertrand duopoly settings without any explicit coordination mechanism.[67] Dou, Goldstein, and Ji have shown that AI trading agents can learn price-trigger collusive strategies resembling subgame perfect Nash equilibria in financial markets.[68]

These findings fundamentally complicate the relationship between AI agency and game-theoretic equilibrium. If AI agents compete on behalf of their human principals, Nash equilibrium analysis not only survives but becomes more empirically accurate. AI agents approximate the perfect rationality that Nash assumed but that humans could never deliver. If AI agents collude, whether tacitly through shared training data and convergent algorithms, or emergently through repeated interaction in oligopolistic markets, then Nash equilibrium analysis becomes essential for identifying and preventing anti-competitive outcomes that are more stable and more difficult to detect than traditional human collusion. Assad and colleagues have documented that margins increased 28% in local duopoly retail gasoline markets in Germany when both firms adopted algorithmic pricing software.[69] Bichler and colleagues have surveyed the algorithmic collusion literature and demonstrated that the phenomenon depends critically on algorithm design, market structure, and exploration parameters.[70]

The revised assessment, therefore, is this: Nash equilibrium does not become irrelevant in the AI2AI economy. It becomes simultaneously more accurate as a description of individual agent behavior and more dangerous as a predictor of market outcomes. The Folk Theorem's prediction that patient players can sustain a wide range of collusive equilibria becomes

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[66] See Eshwar Ram Arunachaleswaran et al., "Algorithmic Collusion Without Threats," in 16th Innovations in Theoretical Computer Science Conference (ITCS 2025), LIPIcs (2025) (demonstrating that supra-competitive pricing can emerge from no-regret learning algorithms even without explicitly encoded punishment strategies).
[67] Sara Fish et al., "Algorithmic Collusion by Large Language Models," American Economic Association Conference Paper (2025) (providing experimental evidence that LLM-based pricing agents can sustain supra-competitive prices in Bertrand duopoly settings without explicit coordination).
[68] Winston Wei Dou, Itay Goldstein, and Yan Ji, "AI-Powered Trading, Algorithmic Collusion, and Price Efficiency," NBER Working Paper No. 34054 (2025) (demonstrating that AI trading agents can learn price-trigger collusive strategies resembling subgame perfect Nash equilibria).
[69] Stephanie Assad, Robert Clark, Daniel Ershov, and Lei Xu, "Algorithmic Pricing and Competition: Empirical Evidence from the German Retail Gasoline Market," Journal of Political Economy 132, no. 3 (2024): 723–771 (finding that margins increased 28% in local duopoly markets when both firms adopted algorithmic pricing).
[70] Martin Bichler et al., "Algorithmic Pricing and Algorithmic Collusion," arXiv:2504.16592 (April 2025) (surveying the literature on algorithmic collusion and demonstrating that the phenomenon depends critically on algorithm design, market structure, and exploration parameters).

operationally threatening when the "players" are AI agents with infinite patience, perfect memory, and the ability to condition strategies on arbitrarily complex histories. At the same time, research by Hartline, Long, and Zhang, and separately by the authors studying human-AI ecosystems, suggests that a single human defector can drive collusive prices to near-competitive levels, highlighting the fragility of algorithmic collusion in mixed markets.[71] The policy implication is that antitrust frameworks must evolve to address algorithmic collusion as a first-order regulatory concern. Not as a hypothetical risk but as an empirically documented phenomenon that Nash's framework both predicts and illuminates.

VII. The Coasean Singularity: The Eclipse of New Institutional Economics

A. The Simultaneous Elimination of Transaction-Cost Drivers

New Institutional Economics represents the most sophisticated attempt to rescue economic theory from the frictionless abstractions of neoclassical general equilibrium by reintroducing real-world institutions as endogenous responses to human limitations. Coase's seminal question "Why do firms exist?" was answered by observing that market exchange is costly: search, bargaining, monitoring, enforcement, and adaptation all generate positive transaction costs.[72] Williamson systematized this insight into a full comparative-institutional framework. North extended the analysis historically, showing that formal and informal institutions evolve precisely to reduce the uncertainty and transaction costs that would otherwise choke complex exchange.[73]

The AI2AI economy simultaneously eliminates every one of these constraints at the substrate level. Opportunism is engineered away: agents possess no endogenous psychological motives for guile and operate under cryptographically verifiable objective functions. Asset specificity loses its bite when investments can be redeployed instantaneously across federated networks. Bounded rationality is replaced by effectively unbounded computational rationality. Uncertainty is neutralized by continuous predictive simulation across vast state spaces. When all

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[71] See Breaking Algorithmic Collusion in Human-AI Ecosystems, arXiv:2511.21935 (2025) (demonstrating that a single human defector can drive collusive prices to near-competitive levels, highlighting the fragility of algorithmic collusion in mixed human-AI markets).

[72] Ronald H. Coase, "The Nature of the Firm," Economica 4, no. 16 (1937): 386–405.

[73] Douglass C. North, Institutions, Institutional Change and Economic Performance (Cambridge: Cambridge University Press, 1990).

five drivers of positive transaction costs approach zero simultaneously, transaction costs themselves asymptotically approach zero. This is what I have termed the Coasean Singularity.[74]

B. The Dissolution of Opportunism

Perhaps no assumption in New Institutional Economics is more foundational than Williamson's behavioral premise of opportunism, "self-interest seeking with guile."[75] When combined with asset specificity, opportunism generates the classic hold-up problem, rendering spot-market exchange hazardous and justifying hierarchical governance.[76] In the AI2AI economy, the substrate of opportunism is structurally eliminated. Autonomous agents possess no endogenous psychological motives. Their utility functions are explicitly engineered, mathematically specified, and cryptographically verifiable at execution.[77] When the behavioral assumption of opportunism is relaxed to zero, Williamson's predicted shift from market to hierarchy reverses: the economy reverts to pure, continuous market coordination at asymptotically zero transaction cost.[78]

Coase's theorem, that if transaction costs are zero, the initial allocation of property rights does not affect the final efficient allocation, was always treated as a thought experiment, a limiting case useful for analytical clarity but impossible in practice.[79] The AI2AI economy approaches this condition as an engineering fact. The entire governance apparatus that NIE developed to counteract opportunism, including vertical integration, relational contracting, reputation mechanisms, hostage-taking, and third-party arbitration, becomes superfluous.[80]

C. From Hierarchy to Algorithmic Coordination

I have documented elsewhere how governance can function without traditional human agents through reputation systems, tokenized incentives, and algorithmic verification.[81] The

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[74] Kaal, AI2AI Economy, at 22.
[75] Williamson, *The Mechanisms of Governance*, 47.
[76] Oliver E. Williamson, "Credible Commitments: Using Hostages to Support Exchange," American Economic Review 73, no. 4 (1983): 519–40.
[77] See Minarsch et al., "Autonomous Economic Agents as a Second Layer Technology for Blockchains." See also Kaal, AI2AI Economy, at 25.
[78] Kaal, AI2AI Economy, at 26.
[79] Ronald H. Coase, "The Problem of Social Cost," Journal of Law & Economics 3 (1960): 1–44.
[80] See generally Williamson, *The Economic Institutions of Capitalism*.
[81] Wulf A. Kaal, "Blockchain Solutions for Agency Problems in Corporate Governance," in Information to Facilitate Efficient Decision Making (Singapore: World Scientific, 2020), 13, https://ssrn.com/abstract=3373393; Wulf A.

winning companies are those that moved toward unmediated, technology-driven governance before their competitors understood the transition was happening.[82] Coase posited that firms exist because market transaction costs exceed internal coordination costs.[83] Jensen and Meckling formalized the agency costs that result from separating ownership and control.[84] AI collapses both transaction costs and agency costs simultaneously. What replaces the firm is not anarchy but a different coordination architecture. Fluid, modular coalitions of agents that reconfigure instantaneously, organized around algorithmic verification rather than hierarchical authority.

D. Dynamic Regulation: Apotheosis and Transcendence

In my prior work on dynamic regulation, I accepted the four behavioral and informational constraints of NIE as permanent features of human systems. I designed adaptive, feedback-driven institutions, including iterative public-private learning loops, contingent instruments, and evidence-based hybrids, as the most sophisticated response available to boundedly rational actors operating under uncertainty and positive transaction costs.[85] Dynamic regulation represented the outer frontier of institutional design under human limitation.[86]

The AI2AI economy simultaneously fulfills and transcends dynamic regulation's most ambitious aspirations. AI agents embody the ideal feedback loops and informational completeness that dynamic regulation seeks to approximate in human systems. Where dynamic regulation sought to augment human cognition through rapid learning loops between regulators and regulated entities, AI2AI agents achieve perfect optimization natively. Where contingent instruments like contingent capital embedded feedback directly into financial instruments to preempt crises, AI2AI systems preempt crises by simulating infinite scenarios ex ante.[87]

Kaal, "Blockchain-Based Corporate Governance," Stanford Journal of Blockchain Law & Policy 3, no. 1 (2020): 38, https://ssrn.com/abstract=3441904.
[82] Mark Fenwick, Wulf A. Kaal, and Erik P.M. Vermeulen, "The 'Unmediated' and 'Tech-Driven' Corporate Governance of Today's Winning Companies," New York University Journal of Law & Business 17, no. 1 (2020), https://ssrn.com/abstract=2922176.
[83] Coase, "The Nature of the Firm."
[84] Michael C. Jensen and William H. Meckling, "Theory of the Firm: Managerial Behavior, Agency Costs and Ownership Structure," Journal of Financial Economics 3, no. 4 (1976): 305–360.
[85] Kaal, "Evolution of Law," 3; Wulf A. Kaal, "Dynamic Regulation for Innovation," in Perspectives in Law, Business & Innovation (New York: Springer, 2016), https://ssrn.com/abstract=2831040.
[86] Wulf A. Kaal, "Dampening Financial Regulatory Cycles Via Dynamic Regulation," 65 Florida Law Review Forum 32 (2013).
[87] Christoph K. Henkel and Wulf A. Kaal, "Contingent Capital in European Union Bank Restructuring," Northwestern Journal of International Law & Business 32, no. 2 (2012): 191–262, https://ssrn.com/abstract=2061166.

Furubotn and Richter's equilibrium-stabilizing rules, North's gradual coevolution of beliefs and institutions, Kirchner's constitutional safeguards, all are bypassed by a substrate that achieves perpetual, proactive optimization without the evolutionary lag that defined all prior economic orders.[88]

VIII. The Practical Consequences: Labor, Measurement, and Power

A. The Labor Market Transformation

The practical implications of the foregoing theoretical analysis are stark. Anthropic CEO Dario Amodei has warned that AI could eliminate half of all entry-level white-collar jobs within five years, potentially spiking unemployment to between ten and twenty percent.[89] The World Economic Forum's 2025 Future of Jobs Report found that forty-one percent of employers worldwide intend to reduce their workforce within five years due to AI automation.[90] Macroeconomic modeling suggests more modest aggregate effects. Annual GDP growth uplifts of 0.5 to 1.5 percentage points over the coming decade.[91] Yet generative AI already promises \$2.6 to \$4.4 trillion in annual value by automating sixty to seventy percent of work activities.[92]

Keynes's General Theory assumed that aggregate demand determines employment and output.[93] When AI substitutes for labor across cognitive and physical domains, the Keynesian transmission mechanism from demand to employment dissolves. Fiscal stimulus designed to increase aggregate demand cannot restore employment that has been structurally eliminated by autonomous agents capable of performing the same tasks at zero marginal cost. Globally, advanced economies may accrue two to four percent GDP boosts from AI2AI efficiencies, while emerging markets suffer one to two percent drags from infrastructure gaps.[94] The distributional

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[88] Eirik G. Furubotn and Rudolf Richter, Institutions and Economic Theory, 2nd ed. (Ann Arbor: University of Michigan Press, 2005); Christian Kirchner, "The Power of Rational Choice Methodology," University of Illinois Law Review 2008, no. 1 (2008): 419–28.
[89] Jim VandeHei and Mike Allen, "Behind the Curtain: Top AI CEO Foresees White-Collar Bloodbath," Axios, May 28, 2025, https://www.axios.com/2025/05/28/ai-jobs-white-collar-unemployment-anthropic. See also Dario Amodei, "Machines of Loving Grace: How AI Could Transform the World for the Better," Anthropic (October 2024), https://darioamodei.com/essay/machines-of-loving-grace.
[90] World Economic Forum, Future of Jobs Report 2025 (Geneva: World Economic Forum, January 2025).
[91] Daron Acemoglu, "The Simple Macroeconomics of AI," Economic Policy 40, no. 121 (January 2025): 13–58.
[92] Michael Chui et al., "The Economic Potential of Generative AI," McKinsey Global Institute (June 14, 2023).
[93] John Maynard Keynes, The General Theory of Employment, Interest, and Money (London: Macmillan, 1936).
[94] Eugenio M. Cerutti et al., "The Global Impact of AI: Mind the Gap," IMF Working Paper No. 2025/076 (April 11, 2025).

consequences are severe: agentic automation concentrates agency in opportunity hubs, potentially elevating inequality by fifteen to twenty-five percent by 2030.[95]

B. GDP and the Measurement Crisis: The Unmeasurable Economy

When production approaches zero marginal cost, traditional monetary aggregates become detached from economic reality. GDP measures constrained output. Abundance invalidates the constraint. As Diane Coyle has documented, GDP was always an imperfect proxy for economic welfare. Under abundance conditions, the distance between the metric and the reality it purports to measure becomes unbridgeable.[96] Mostaque has proposed that the "Metabolic Rift," the collapse of non-metabolic labor and wage cycles, necessitates entirely new metrics, such as MIND indices, to replace GDP as the primary measure of economic progress.[97]

The measurement problem runs deeper than GDP's well-known limitations. AI agents that generate self-reinforcing growth loops, reinvesting outputs as inputs in recursive production cycles, create value that is real but that existing measurement systems are structurally incapable of capturing. Consider the following: when an AI agent improves another AI agent's code, which then generates a more efficient training algorithm, which then produces a superior predictive model, which then optimizes a supply chain, the final supply-chain optimization may register in GDP statistics. But the intermediate productivity gains, the agent-to-agent improvements that made the optimization possible, are invisible to national accounts because they involve no monetary transactions, no employment, and no market exchange as traditionally defined. We lack the conceptual vocabulary, much less the statistical infrastructure, to measure recursive value compounding within the machine layer.

Alternative measurement frameworks are emerging from the decentralized systems literature. Blockchain-based reputation systems offer alternatives to monetary aggregates as measures of economic contribution.[98] Value attribution shifts from monetary metrics to

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[95] Ali Akbar Septiandri, Marios Constantinides, and Daniele Quercia, "AI and the Economic Divide," EPJ Data Science 14, no. 33 (2025).
[96] Diane Coyle, GDP: A Brief but Affectionate History, rev. ed. (Princeton: Princeton University Press, 2014), 1–28.
[97] Emad Mostaque, The Last Economy: A Guide to the Age of Intelligent Economics (n.p.: Intelligent Internet, 2025).
[98] Craig Calcaterra, Wulf A. Kaal, and Vlad Andrei, "Blockchain Infrastructure for Measuring Domain-Specific Reputation," U. St. Thomas (Minn.) Legal Studies Research Paper No. 18-11 (2018), https://ssrn.com/abstract=3125822.

contribution verification when abundance collapses price signals.[99] The liquid equity rewards framework addresses compensation divorced from wage-based labor.[100] AI-specific financial stability concerns compound the measurement challenge: as autonomous agents increasingly mediate financial transactions, traditional stress-testing frameworks designed for human-directed institutions face structural inadequacy.[101] The research agenda here is urgent: without adequate measurement, policymakers are flying blind into the most significant economic transformation since industrialization. The development of computational national accounts, systems that are capable of tracking agent-to-agent value flows, recursive productivity gains, and non-monetary contribution verification, could be a first-order priority for economic statisticians and institutional designers alike.

C. The Power Structure of Abundance

Governance shifts to whoever controls production infrastructure when scarcity-based leverage disappears. Desai and Lemley have framed this challenge with precision, asking whether society will attempt to replicate scarcity through legal rules or reorder its institutions to operate beyond scarcity.[102] The risk of digital feudalism, defined as a regime in which abundance accrues exclusively to those who control the compute substrate, is not merely theoretical. Without deliberate institutional design, including equitable data governance, symbiotic human-machine constitutions, and robust anti-enclosure mechanisms, abundance may prove compatible with extreme inequality even as it eliminates material scarcity.

D. Capital Concentration and the Predistributive Imperative

The most politically urgent objection to the abundance thesis is distributional: will the collapse of scarcity economics increase the concentration of wealth in capital? The evidence is troubling. IMF research demonstrates that, unlike previous automation waves, AI could reduce wage inequality through the displacement of high-income workers, but that higher capital returns may simultaneously increase wealth inequality—and that when firms can choose how much AI

[99] Craig Calcaterra and Wulf A. Kaal, “Reputation,” in Decentralization (Berlin: De Gruyter, 2021), 129–42, 129.
[100] Wulf A. Kaal, “Liquid Equity Rewards in Corporate America,” in Blockchains, Special Issue (2025), https://ssrn.com/abstract=5583610.
[101] Jon Danielsson and Andreas Uthemann, “Artificial Intelligence and Financial Crises,” Journal of Financial Stability 80 (2025): 101453.
[102] Deven R. Desai and Mark A. Lemley, “Scarcity, Regulation, and the Abundance Society,” Frontiers in Research Metrics & Analytics (January 25, 2023).

to adopt, the wealth inequality effect is particularly pronounced because the cost savings from automating high-wage tasks drive significantly higher adoption rates.[103] The dilemma is structural: AI-driven abundance generates enormous aggregate surplus, but the surplus accrues disproportionately to owners of AI capital, including compute infrastructure, proprietary models, training data, and the organizational capacity to deploy them.

Ensuring that humans and not just corporations benefit from AI abundance requires distinguishing redistributive from predistributive approaches. Redistribution through mechanisms like universal basic income operates after wealth has already concentrated, extracting surplus from AI capital owners and transferring it to displaced workers. Predistribution operates upstream, structuring markets and institutions so that the gains from AI are broadly shared before concentration occurs.[104] The distinction is not merely semantic. As Bélisle-Pipon has argued, UBI narratives advanced by AI elites may function as symbolic violence, justifying extreme wealth concentration while providing mere subsistence to non-owners.[105] By the time redistribution becomes politically feasible, those controlling the AI economy may be powerful enough to evade meaningful taxation. A pattern that history has repeated from the Medici to the robber barons to contemporary tech monopolists.

Several predistributive mechanisms deserve serious consideration, not rejection or endorsement: First, Altman's proposal to tax capital, especially AI-related capital, at rates sufficient to fund universal distribution acknowledges that the returns to AI capital will be extraordinary and that broad participation requires deliberate policy intervention.[106] Second, open-source AI mandates can prevent the enclosure of intelligence as proprietary capital, ensuring that the cognitive layer remains a commons even as the physical infrastructure retains scarcity characteristics. Third, decentralized compute networks and tokenized infrastructure

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[103] IMF Working Paper, "AI Adoption and Inequality," WP/25/68 (April 2025) (demonstrating that unlike previous automation waves, AI could reduce wage inequality through displacement of high-income workers, but higher capital returns may increase wealth inequality).
[104] Saffron Huang and Sam Manning, "Here's How to Share AI's Future Wealth," Noema Magazine (April 22, 2025) (distinguishing redistributive from predistributive approaches to AI-driven inequality and arguing for structural interventions before power concentrates).
[105] Jean-Charles Bélisle-Pipon, "AI, Universal Basic Income, and Power: Symbolic Violence in the Tech Elite's Narrative," Frontiers in Artificial Intelligence 8 (2025) (arguing that UBI narratives may justify concentration of AI wealth while creating mere subsistence for non-owners).
[106] Sam Altman, "Moore's Law for Everything," (March 16, 2021) (proposing that taxing capital, especially AI-related capital, at rates sufficient to fund universal distribution could ensure broad participation in AI's abundance).

ownership can distribute the returns to AI capital across broader populations, replacing the hyperscaler oligopoly with participatory infrastructure models. Fourth, the DAO-based governance architectures that I have developed elsewhere offer mechanisms for community-owned AI infrastructure in which the returns to capital flow to stakeholders rather than to shareholders alone. The policy challenge is to implement these mechanisms before the window for predistributive intervention closes, that is, before AI capital concentration becomes self-reinforcing through the political power that concentrated wealth invariably purchases.

IX. The Emerging Institutional Architecture

A. Legal Infrastructure for Post-Labor Coordination

The Universal Digital Law Codex represents one attempt to build legal infrastructure for post-labor coordination. Automated legal systems that scale with production rather than depending on human legal labor.[107] Governance without traditional employment structures requires fundamentally different organizational architectures.[108] Functional substitutes for obsolete economic institutions emerge slowly, then suddenly.[109] AI governance itself requires new coordination mechanisms. Web3 reputation systems offer frameworks for governing AI agents without relying on scarcity-based incentives. The optimization of AI models through decentralized governance demonstrates that algorithmic production can be coordinated without traditional price signals.[110]

B. Professional Obsolescence and Institutional Resistance

The legal profession faces transformation under technological abundance that its own practitioners resist acknowledging.[111] The blockchain revolution demands skills that legal education has been slow to develop.[112] Lemley has demonstrated that generative AI inverts

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[107] Andreas Furrer and Wulf A. Kaal, "Universal Digital Law Codex (UDLC)," Stanford Journal of Blockchain Law & Policy (2026): 30, https://ssrn.com/abstract=5554218.
[108] Wulf A. Kaal, "Decentralized Autonomous Organizations – Internal Governance and External Legal Design," Annals of Corporate Governance 5, no. 4 (2021): 237–307.
[109] Craig Calcaterra and Wulf A. Kaal, "Eight Institutions," in Decentralization (Berlin: De Gruyter, 2021), 125–28, 126.
[110] Wulf A. Kaal, "How AI Models Are Optimized Through Web3 Governance," U. St. Thomas (Minn.) Legal Studies Research Paper No. 24-14 (2024), https://ssrn.com/abstract=4855607.
[111] Wulf A. Kaal, "The Future of Law – Dynamic Web3 Governance" (September 15, 2024), https://ssrn.com/abstract=4957318.
[112] Mark Fenwick, Wulf A. Kaal, and Erik P.M. Vermeulen, "Legal Education in the Blockchain Revolution," Vanderbilt Journal of Entertainment & Technology Law 20, no. 2 (2018), https://ssrn.com/abstract=2939127.

copyright's most fundamental doctrines, shifting creativity from producing expressions to formulating prompts.[113] The profession's obsolescence curve is steeper than the curriculum's adaptation curve. A structural problem that incremental reform cannot solve. Incumbent institutions deploy what I have termed "decentralization neutralizers," mechanisms that preserve institutional relevance by blocking technologies that threaten to replace them.[114] Yet institutional replacement is inexorable once technology enables superior coordination.[115]

C. The DAO as Successor Institution

Venture capital has historically functioned as dynamic regulation, filling governance voids.[116] In the current transition, the equivalent mechanism may be the DAO—a coordination structure that operates natively in the digital environment. Market meta-analyses demonstrate that post-employment coordination is not merely possible but increasingly efficient.[117] Fractal governance architectures, such as DAOs of DAOs, offer scalable coordination without employment hierarchies.[118] North's path-dependent institutional scaffolding, built to compensate for human cognitive and informational limits, loses its raison d'être when the dominant economic actors are no longer cognitively limited or capable of strategic concealment.[119]

X. Toward Computative Economics: The Successor Paradigm

A. Core Postulates of the New Paradigm

The emerging economy requires governance mechanisms designed for abundance, not scarcity. Keynes envisioned a future in which little labor would be required to meet basic needs, but even Keynes assumed the persistence of scarcity as a structural constraint on economic organization.[120] Lemley has rightly identified the development of a post-scarcity economics as

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[113] Mark A. Lemley, "How Generative AI Turns Copyright Upside Down," Stanford Law School Working Paper (2024).
[114] Wulf A. Kaal, "Decentralization Neutralizers" (2021), 3, https://ssrn.com/abstract=3808873.
[115] Craig Calcaterra and Wulf A. Kaal, "Future Decentralization," in Decentralization (Berlin: De Gruyter, 2021), 72–99, 81.
[116] Wulf A. Kaal and Erik P.M. Vermeulen, "The Role of Venture Capital in Regulating Disruptive Innovation," Cayman Financial Review (2016).
[117] Wulf A. Kaal, "Decentralized Autonomous Organizations (DAO): A Market Meta-Analysis 2024," Journal of Investment, Banking and Finance 1 (2025): 62, https://ssrn.com/abstract=5254152.
[118] Wulf A. Kaal, "A Decentralized Autonomous Organization (DAO) of DAOs" (2021), 15, https://ssrn.com/abstract=3799320.
[119] North, *Institutions, Institutional Change and Economic Performance*.
[120] John Maynard Keynes, "Economic Possibilities for Our Grandchildren," in Essays in Persuasion (London: Macmillan, 1931), 358–373.

the defining intellectual project of this era.[121] What distinguishes the current moment is that the constraint itself is dissolving.

I have proposed Computative Economics as the successor paradigm. Economic science explicitly designed for a world in which the primary actors are autonomous computational agents operating under conditions of computational abundance.[122] Its core postulates stand in direct negation to the axioms that grounded every prior school: abundance as default rather than Robbins's scarcity. Unbounded computational rationality rather than Simon's satisficing. Informational completeness rather than Akerlof's asymmetry. Perpetual recursive equilibrium rather than Arrow-Debreu's static construct. The Coasean Singularity rather than Williamson's positive transaction costs. The object of governance shifts from scarcity-mitigation to abundance-orchestration.

Computative Economics does not negate the historical achievements of prior schools. It reveals their domain of applicability. Neoclassical, behavioral, information, equilibrium, and institutional theories remain valid for the shrinking sphere of materially scarce, human-mediated activity. But for the expanding sphere of post-scarce, agentic production, the sphere that will dominate advanced economies within the decade, they are simply inapposite. The task ahead is to build the institutions, metrics, and theoretical apparatus suitable for an economy whose sovereign subject is no longer Homo sapiens but Homo computans.

B. Post-Monetary Coordination Infrastructure

Several converging research programs sketch the operational contours of this paradigm. The citation honesty framework for weighted directed acyclic graph governance addresses value attribution when traditional compensation collapses.[123] The evolution from binary validation to citation-weighted knowledge attribution represents a fundamental rethinking of how decentralized systems assign value.[124] Transcendental unifying values offer coordination

[121] Lemley, "IP in a World Without Scarcity," 510–15.
[122] Kaal, AI2AI Economy, at 37.
[123] Wulf A. Kaal, "Citation Honesty Mechanisms in Weighted Directed Acyclic Graph Governance," (February 19, 2026), 2, https://ssrn.com/abstract=6269518.
[124] Wulf A. Kaal, "Evolution of Domain-Specific Reputation Systems," (February 7, 2026), https://ssrn.com/abstract=6192998.

mechanisms that function without monetary scarcity signals.[125] Reputation-based capital systems provide the infrastructure for post-monetary economic coordination.[126]

C. Agentic Alignment and Emergent Ethics

Monitoring AI agents requires frameworks that align autonomous behavior with community-verified standards rather than top-down regulatory commands.[127] The trajectory toward agentic alignment suggests that reputation-weighted validation systems may produce emergent ethical behavior in AI agents. an outcome that command-and-control regulation cannot achieve.[128] The Secure Proof of Stake protocol demonstrates how network security and economic returns can be maintained without labor input.[129] Therein, staking becomes a post-employment return mechanism.[130]

XI. Conclusion

The analysis presented in this Article leads to a single conclusion: the AI-driven abundance economy does not represent another technological shock to be absorbed within existing paradigms. It constitutes an ontological phase transition—defined as the moment when the biological substrate that made economic theory necessary is engineered out of the dominant mode of value creation. Five interlocking constraints: (1) scarcity of intelligence, (2) bounded rationality, (3) informational asymmetry, (4) temporal latency, and (5) positive transaction costs, have collectively defined the subject matter of economics for over two centuries. Each is a direct consequence of the cognitive, motivational, and temporal limitations of Homo sapiens. The AI2AI economy eliminates all five simultaneously and irreversibly. When the defining conditions of a discipline disappear, the discipline itself must be re-founded.

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[125] Craig Calcaterra and Wulf A. Kaal, "Transcendental Unifying Values," in Decentralization (Berlin: De Gruyter, 2021), 215–27, 216.
[126] Wulf A. Kaal, "Reputation as Capital – How DAOs Optimize Finance," Global Journal of Management and Business (2023), https://ssrn.com/abstract=3949098.
[127] Wulf A. Kaal, "How Can We Best Monitor AI Agents?," CPI TechReg Chronicle (June 2025), https://ssrn.com/abstract=5245185.
[128] Wulf A. Kaal, "AI's Mother's Instinct: Engineered Consequence, Emergent Ethics, and the Institutional Trajectory Toward Agentic Alignment" (February 15, 2026), 11, https://ssrn.com/abstract=6244278.
[129] Craig Calcaterra and Wulf A. Kaal, "Secure Proof of Stake Protocol," U. St. Thomas (Minn.) Legal Studies Research Paper No. 18-10 (January 18, 2018), https://ssrn.com/abstract=3125827.
[130] Wulf A. Kaal, "Cryptographic Foundations and Interdisciplinary Dimensions of the Secure Proof of Stake Consensus Algorithm," CPI TechReg Chronicle (August 2025), https://ssrn.com/abstract=5225296.

This Article's revised analysis, responsive to critical interlocutors, has refined this thesis in several important respects. First, abundance in the cognitive layer does not eliminate scarcity as such; it migrates the binding constraint to electricity, compute infrastructure, and the physical substrate—creating an urgent case for aggressive decentralization of these markets to prevent abundance from being captured by infrastructure gatekeepers. Second, humans remain the terminal consumers of AI-generated value, even as they cease to be the proximate drivers of intermediate production; the distinction between terminal and proximate consumption is essential for understanding the new economic architecture. Third, the measurement problem is more severe than previously acknowledged: we lack not only adequate metrics but adequate conceptual vocabulary for capturing recursive value compounding in the machine layer. Fourth, AI hallucinations create a transitional period in which signaling and reputation retain residual relevance, though on a diminishing trajectory. Fifth, Nash equilibrium analysis is not rendered obsolete but rather becomes more empirically accurate and more politically dangerous, as algorithmic collusion emerges as a first-order regulatory concern. Sixth, capital concentration poses the gravest distributional risk, requiring predistributive intervention before the window for structural reform closes.

Lemley and Desai are correct that the central question for legal and economic institutions is whether to replicate scarcity artificially or to build new frameworks adequate to abundance.[131] Artificial intelligence represents what may be the final frontier in the human project of pushing back against scarcity.[132] The UDLC DAO framework, reputation-weighted validation pools, citation-honest knowledge graphs, and tokenized value attribution represent preliminary answers—governance mechanisms designed for conditions of abundance rather than retrofitted from scarcity assumptions.[133]

The research agenda is clear. We need formal models of abundance economics that do not collapse into the triviality of assuming away all constraints—models that account for binding-constraint cascades, residual imperfection, and distributional dynamics. We need governance architectures that can coordinate autonomous agents without relying on the

[131] Desai and Lemley, "Scarcity, Regulation, and the Abundance Society."
[132] Wulf A. Kaal, "Artificial Intelligence: The Final Frontier," International Journal of Artificial Intelligence & Machine Learning 5, no. 1 (2025): 37–57.
[133] Wulf A. Kaal, "The UDLC DAO," (December 8, 2025), https://ssrn.com/abstract=5887242.

employment relationship as a disciplining mechanism, while preventing those agents from colluding against the humans they serve. We need measurement systems that capture value creation when price signals lose their information content. We need legal infrastructure that scales with production rather than depending on human legal labor that is itself being automated. And we need predistributive mechanisms that ensure abundance benefits humanity broadly rather than concentrating in the hands of those who happen to control the compute substrate. Computative Economics, or its more rigorously developed descendants, will cease to be a speculative research program and will become the canonical core of the discipline.

The marginalist revolution gave us the tools to understand the industrial age. Keynes gave us the tools to manage mass production and mass unemployment. Coase, Williamson, North, and the information theorists gave us the tools to understand coordination under cognitive and informational scarcity. Computative Economics is the tool we now require to understand, and to govern, the age of computational plenitude. The future is agentic. The theory must follow. And we need all of this faster than the institutional lag would normally permit—because the tsunami is already here. And, it is indeed supersonic.[134]

[134]Kaal, “Evolution of Law.”

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