After Economy:
Constraint, Price, and
the End of the Fiscal World

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Abstract

Price is a late institutional interface, a derived form of commensuration that arrives after value has already been made consequential. The deeper sequence runs through constraint, patterned flow, cost, allocation, bind, valuation, commensuration, price, money, market, capital, and financial abstraction. Physical systems supply gradients and dissipation; economic language enters there only by analogy. Cells allocate energy, metabolites, membrane gradients, and repair capacity under viability constraints; they have costs and tradeoffs but no prices. Organisms budget energy, attention, immune response, movement, and reproduction. Sensorimotor systems transact with environments before they exchange anything: a ball in flight and a catcher form a temporary field of reciprocal constraint in which action possibilities compete for realization. Human economies stabilize these older structures under social value frames. Gifts create debt without money. Blood compensation creates price without market. States fiscalize grain, land, labor, debt, and bodies before capitalism. Capitalism inherits value, money, markets, and price, subordinates them to accumulation, and treats capitalized price as the privileged public form of value. Financialization extends that move by pricing claims on future income, risk, collateral, volatility, liquidity, and state rescue. The phrase "after economy" can survive only as a precise claim: after the monetary-price form loses its monopoly over the interpretation of value. AI, platforms, ecological accounting, open-source production, public provisioning, carbon budgets, and post-scarcity imaginaries leave allocation intact and shift it into compute, attention, energy, access, reputation, and governance. The problem after economy is the political form taken by allocation after price ceases to appear as ontology. A small allocation model makes the structural claim auditable: undistorted prices reproduce the constraint-optimal allocation exactly, while a speculative markup on finance raises its budget share from 0.02 to 0.26 and costs 8.08 percent of system viability.

1. Price Is Not Ontology

Modern social life often treats price as the public test of reality. A forest becomes real to an institution when it enters a balance sheet, a carbon market, an insurance model, a concession, a tax schedule, or a damages claim. A person's time becomes real when it becomes wage time, billable time, platform time, or debt-service time. Attention becomes real when it is sold through an auction system. Risk becomes real when it is priced as premium, spread, derivative, or reserve requirement.

The achievement is historical. Price is a technique for stabilizing commensuration. It makes heterogeneous things comparable under a unit and an institution. It can attach to bread, labor, rent, injury, land, risk, carbon, reputation, and attention. The attachment arrives after a value frame has already made the thing socially, biologically, legally, or politically consequential. Blood matters before blood compensation. Labor matters before wages. Land matters before rent. Attention matters before advertising auctions. Carbon matters before carbon credits.

The useful threshold is *economicity*. A relation becomes economy-like when constrained flows are recurrently allocated under a value frame and a stabilizing mechanism. The mechanism may be

metabolism, habit, kinship, ritual, law, fiscal administration, money, platform code, or ecological governance. A river has constrained flow; that is physics. A cell allocating proteome between growth and repair has economy-like organization because alternative pathways matter for viability. A gift relation has economy because obligation, prestige, delay, and reciprocity stabilize transfers across time. A state has economy when land, grain, labor, and population become legible to accounts and extraction.

Economy enters before money and markets, and after bare constraint. The chain is narrower:

$$\text{constraint} \rightarrow \text{flow} \rightarrow \text{cost} \rightarrow \text{allocation} \rightarrow \text{valuation} \rightarrow \text{commensuration} \rightarrow \text{price}.$$

Money generalizes some prices. Markets produce and discipline some prices. Capital reorganizes price around accumulation. Finance prices claims on future conditions. The historical error of monetary civilization is treating one interface in this chain as the truth of the whole chain.

2. Constraint Before Economy

Constraint is deeper than economy. A constraint reduces possible states or paths. It can be physical, chemical, biological, social, legal, symbolic, computational, or ecological. A membrane constrains molecular movement. A rule constrains access. A taboo constrains action. A price constrains demand. An algorithm constrains visibility. A carbon budget constrains permissible combustion.

Flow is constraint's counterpart. Matter, energy, information, affect, obligation, signs, money, and risk move through channels whose structure selects what can pass. Deacon's account of constraint, Prigogine's dissipative structures, and Schrödinger's discussion of life as an order-maintaining process all matter because they prevent the social concept of economy from floating free of physics. They also impose a guardrail. Dissipation is not economy. A falling rock does not allocate among value-bearing alternatives. Physical systems give gradients, channels, barriers, work, and loss. Economicity appears later, when constrained flow is distributed among alternative pathways that matter to persistence, reproduction, rank, power, legitimacy, or value.

Biology is the earliest level where the economy analogy becomes analytically useful. Living systems maintain themselves by regulating flows under constraint. The cell is bounded, selective, and temporally organized. It must allocate resources among growth, repair, replication, movement, defense, dormancy, and death. A bacterium under nutrient stress shifts expression, metabolism, and repair in ways that can be modeled as resource allocation. The language remains dangerous because it tempts anthropomorphism. Cells allocate through regulation, outside calculation, property, bargaining, and settlement.

Cost enters here in a restricted sense. Physical cost can mean energy dissipated or exergy lost. Biological cost means expenditure relative to viability, repair, replication, or survival. Social cost means burden under a norm or institution. Economic cost means foregone alternatives under a value regime. The same word crosses levels, but its reference changes.

3. Cost Without Price

ATP is often called the cell's energy currency. The phrase is useful only under strict limits. ATP couples otherwise unfavorable biochemical reactions to cellular work; it is generated, hydrolyzed, regenerated, and routed through pathways. It lacks the institutional features of money: unit of account, social payment, legal settlement, durable store of value, property transfer, and public price expression. ATP is currency-like as an energy carrier, not as money.

The cellular case still matters. Protein synthesis, ion transport, motility, DNA repair, membrane maintenance, and replication impose costs. A cell can invest in growth at the expense of stress resistance, or in repair at the expense of replication speed. Resource-allocation models in cell biology are useful precisely because the cell faces constrained alternatives. Cost exists here outside price.

Organisms extend the same structure across more registers. Glucose, oxygen, fat storage, immune activation, sleep, pain, reproduction, risk, and attention are distributed under constraints. Fever consumes energy; immune response can damage tissue; reproduction competes with repair; vigilance competes with rest; movement exposes the organism to danger while securing food or mates. Physiology budgets before reflective calculation appears.

Read as analogy and not identity, these cases block a common reduction. The existence of cost does not imply money, and the existence of allocation does not imply market exchange. A system can expend, conserve, defer, repair, or sacrifice without pricing. Price is a later public technique for making some of these burdens commensurable, and §11 makes that claim auditable on a small allocation model.

4. Transaction Without Exchange

The ball-catcher relation is a clean case because it contains transaction without exchange. A ball in flight constrains possible futures through gravity, spin, speed, trajectory, distance, and time-to-contact. The catcher participates in the field. Vision tracks motion; posture changes; the body moves to reduce error; the hand opens; impact is absorbed. Ball and catcher form a temporary dynamical bind. The future state of each is constrained by the relation.

Transaction, in this broad sense, means a state-changing coupling between systems. Exchange is narrower. Exchange requires recognized reciprocal transfer, and social exchange requires conventions or agents capable of treating the transfer as transfer. Monetary exchange adds property, price, settlement, and account. Capital transaction adds the advance of value for augmentation.

Gibson's concept of affordance gives the example its force. The ball affords catching only relative to a body with specific capacities, position, skill, attention, and timing. Uexküll's *Umwelt* adds the same point from another direction: the world that matters to an organism is structured by the organism's sensorimotor form. Enactive cognition and active-inference models make the coupling still sharper. The organism acts in order to maintain a workable relation with the field of constraints it encounters.

The case is a dynamical transaction under a task-relative value frame. Successful interception mat-

ters to the system. Energy and time are spent. The catch succeeds or fails. The example prevents the monetary transaction from posing as the primitive case. Purchase is one late species of transaction.

5. Debt Without Money

The gift gives a social form of allocation without monetary price. Mauss's classic triad, the obligation to give, receive, and return, describes a system in which objects move, but the object is never the whole event. Prestige, honor, delay, dependency, alliance, and memory move with it. A gift received creates an asymmetry that has to be carried until it is answered, transformed, refused, or converted into subordination.

The gift produces debt without money and value without price. The return gift may be measured loosely, ritually, competitively, or symbolically; it may carry no scalar equivalent. The debt can be felt as gratitude, shame, obligation, rank, or danger. Bourdieu's work on symbolic capital prevents the gift from becoming a sentimental alternative to exchange. Generosity can dominate. Delay can discipline. Recognition can bind more tightly than contract.

Polanyi's embeddedness remains useful here because it breaks the false naturalism of market exchange. Provisioning, reciprocity, redistribution, and householding are real before pricing enters them. Sahlins's work on Stone Age economics and Graeber's work on debt extend the same correction, though both require local historical discipline. The point is structural. Money is one way to settle an obligation. Obligation is older and wider.

6. Price Without Market

Blood compensation is the strongest case for price outside markets. Wergild, blood money, fines, legal damages, penance, and compensation schedules convert injury, death, guilt, and vengeance into a compensable form. The payment is a legal-ritual commensuration that contains violence and stabilizes rank, responsibility, and closure.

The functions are precise. Commensuration turns harm into a payable or performable form. Containment prevents revenge from extending indefinitely. Hierarchy appears when compensation varies by status, kin position, gender, or political order. Sovereignty appears when the authority to set compensation, accept settlement, or refuse revenge moves from kin groups to courts, rulers, churches, or states.

Nietzsche's genealogy of creditor, debtor, memory, pain, and punishment belongs here as philosophy, with legal history left to legal-historical sources. Girard and Bataille belong here because sacrifice, expenditure, and violence sit near the boundary between compensation and order. Legal anthropology supplies the empirical guardrail: blood price is kinship, feud, masculinity, status, cosmology, penalty, and authority in a specific arrangement, with the number as one surface of the settlement.

The claim can be stated without overreach. There can be price without market. There can be

value without price. A real price requires a valuation and commensuration regime behind it. Price without such a regime is metaphor.

7. Fiscalization Before Capitalism

States inherit provisioning, exchange, and obligation, then change the scale and medium of legibility. Fiscalization begins when land, grain, labor, animals, debts, persons, and days become recordable claims. Mesopotamian tablets are central because they show accounting, rations, silver and barley equivalences, temple and palace administration, labor obligations, and debt records long before capitalism. Writing in this setting functions as an administrative technology for making flows durable, comparable, and enforceable.

Scott's grain-state argument gives the ecological and administrative side of the problem. Grain is taxable because it is visible, divisible, storable, measurable, and tied to sedentary fields. Goody and Schmandt-Besserat give the media side: lists, tablets, tokens, seals, and writing change what can be counted and transmitted. Hudson's work on ancient debt and clean slates gives the political side: creditor claims can endanger social reproduction and require sovereign interruption.

The birth of economy needs careful phrasing. Economic activity has no single birth. The modern economy as a bounded macro-object is much later and depends on statistics, national accounting, and policy expertise, as Mitchell argues for the twentieth century. Mesopotamia helps invent fiscalized reality: the conversion of heterogeneous life into accounts that an institution can store, compare, command, and settle.

Fiscalization is the ancestor of later monetary civilization because it trains institutions to treat the world as an accountable surface. Taxes, rations, debt ledgers, censuses, tribute, land measurement, and labor obligations turn persons and things into units of obligation. The ledger precedes the market as a governing interface.

8. Money, Market, Capital

Money generalizes commensuration. Simmel's account of money as abstraction and social distance remains one of the cleanest descriptions of the change. Money loosens things from local relations by giving them a common form. Marx supplies the deeper transformation: the money-form emerges as the universal equivalent and then becomes the medium through which commodities, labor-power, and capital circulate. Weber adds the discipline of calculability: bookkeeping, bureaucracy, vocation, methodical conduct, and rationalized enterprise.

Markets are older and broader than capitalism. Braudel's distinction between material life, markets, and capitalism matters because it blocks the reduction of all exchange to capital. Markets coordinate through repeated exchange under norms, property, and price. Capitalism reorganizes market forms around accumulation. Marx's formula $M - C - M'$ captures the shift. Money is advanced to return as more money. Labor-power, land, tools, debts, and time are drawn into that circuit.

The chartered corporation intensifies the circuit by joining accounting, monopoly, violence, and sovereignty. The English East India Company and the VOC matter because they condensed corporate personality, state authorization, armed capacity, monopoly privilege, territorial administration, and fiscal extraction. The plantation ledger carries the same logic in a more naked form: bodies rendered as assets, labor capacity, depreciation, discipline, insurance risk, and future output.

Capitalism inherits value, price, money, and markets, subordinates them to accumulation, and treats capitalized price as the privileged public truth of value. What cannot enter that form is externalized, enclosed, moralized, subsidized, or destroyed.

9. Financialization and Computation

Financialization extends fiscalization into the future. Grain, labor, land, and tax become the earlier objects of legibility. Future income, volatility, risk, debt service, collateral, liquidity, and state rescue become the financial objects. Krippner's definition of financialization as a pattern in which profits accrue increasingly through financial channels remains useful, provided the phrase is kept material. Finance remains anchored in production, rent, households, public guarantees, ecological extraction, and future solvency by pricing claims on them.

Financial abstraction is recursive because prices become inputs into further prices. A mortgage becomes a security. A security becomes collateral. Collateral supports leverage. Risk models price the instrument; the price of the instrument feeds risk and liquidity models. The result is enforceable claim layered on enforceable claim, held together by law, accounting, counterparties, central banks, and the expectation that someone will absorb losses when the chain fails.

Computation changes the form of allocation without escaping the problem of power. Hayek's argument for prices as carriers of dispersed knowledge remains serious. Mises's calculation argument remains serious. Stafford Beer's cybernetics, Cockshott-style computational planning, platform logistics, and contemporary AI all reopen the technical question. They do not settle preference formation, tacit knowledge, legitimacy, distributional conflict, corruption, ecological constraint, or the choice of objective function.

Platforms already allocate without ordinary market price at many interfaces. Feeds allocate attention. Search allocates visibility. Credit models allocate trust. Hiring systems allocate access to work. Insurance models allocate risk categories. Cloud systems allocate compute. Recommenders allocate cultural probability. These mechanisms often coexist with prices, auctions, subscriptions, and rents. After price may arrive as more calculation, not less domination.

10. Ecology and Post-Scarcity

Post-scarcity is coherent only when its object is specified. Digital copying can approach abundance because marginal reproduction is low. Symbolic production can become cheap in some domains. Open-source software and peer-produced knowledge show that high-value work can be organized

partly outside direct price, though it still depends on hidden labor, firms, universities, states, protocols, energy, devices, and time. Public provisioning can decommodify some necessities. None of these facts abolishes material constraint.

Ecological economics gives the hard boundary. Georgescu-Roegen's entropy argument and Daly's steady-state economics insist that economic systems are throughput systems embedded in biophysical limits. Energy, carbon, water, metals, soil, biodiversity, heat, waste, land, and repair remain allocative problems. Carbon budgets are price-like only when an institution makes them tradable or taxable. In themselves they are constraint accounts.

The Banksian phrase, money as a sign of poverty, is useful as a test. In monetary civilization, money signifies access. In a genuine post-scarcity regime, necessity would be decommodified: food, shelter, care, education, communication, transport, and cultural participation would be guaranteed outside individual purchasing power. Money would then mark optional scarcity, positional goods, unique places, prestige, danger, or luxuries. If money disappears first from luxury while survival remains priced, the condition is oligarchic abundance.

After economy names this fork. One path weakens the monopoly of price through commons, public provisioning, democratic planning, ecological constraint, and machine coordination accountable to political judgment. The other path completes total economy: every gesture scored, every attention stream auctioned, every ecological limit financialized, every reputation quantified, every access right tiered, every model optimized for an owner. The same technologies make both paths more plausible.

11. A model of allocation under constraint

The claim that price is an interface rather than a substrate can be made auditable on a small model. A system divides a fixed budget across six sectors, subsistence, infrastructure, care, knowledge, ecology, and finance, each with concave viability returns. Finance carries a low true weight, since it coordinates claims rather than sustaining the system directly. Three coordinators allocate the same budget. The constraint coordinator maximises total viability under the budget alone, with no prices, in the manner of a cell dividing energy among repair and maintenance. A faithful price coordinator sets prices equal to marginal viability. A financialised coordinator applies a speculative markup to the price of finance and allocates to maximise price-weighted return.

The constraint optimum reaches a total viability of 4.97 and holds finance at 0.02 of the budget. The faithful price coordinator reproduces that allocation exactly: its divergence from the optimum is 0.0. Undistorted, price is a transparent interface onto the allocation that constraint already determines, which is the precise sense in which price is not ontology.

A markup on finance breaks the correspondence. At a distortion of 3 the financialised coordinator raises finance from 0.02 to 0.26 of the budget and loses 8.08 percent of true viability against the optimum. The loss grows with the distortion: at a markup of 8 finance takes more than half the budget and viability falls by 25.1 percent. These numbers are facts about the model's geometry, not measurements of any economy. The model claims only what a stylised construction can: a price

interface carrying true marginal values is informationally free and reproduces the constraint optimum exactly, while a distorted interface is not, at a cost that grows with the distortion. It exhibits the mechanism and its direction, not the magnitude of any real misallocation. Allocation under constraint is the invariant; the price interface tracks it faithfully only while it stays undistorted; the recursive markup of financialization is the mechanism by which the interface detaches from the allocation it was meant to carry, and the detachment costs viability the priced surface does not display.

The simulation in `simulation/` computes each allocation by water-filling on marginal viability and writes every figure and number to `simulation/output/results.json`.

12. Conclusion

Price can lose authority while constraint, cost, allocation, obligation, desire, scarcity, excess, risk, and power remain. The defensible claim is narrower and stronger: monetary price is losing its monopoly as the public interface of value, while other allocation regimes become explicit.

Cells show cost without price. Sensorimotor coupling shows transaction without exchange. Gifts show debt without money. Blood compensation shows price without market. Fiscal states show legibility before capitalism. Capital shows price subordinated to accumulation. Finance shows claims on future conditions recursively priced. Computation shows allocation through prediction, ranking, and access. Ecology shows constraint returning as the limit of every abundance claim.

After economy is a question about sovereignty over allocation. If price ceases to appear as ontology, something else will decide what matters, what circulates, what is scarce, what may be accessed, what must be sacrificed, and who bears the cost. The name of that something is still open.

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