# The Noise Tax: Entropy, Responsibility, and the Economics of Coherence

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**Abstract**

The concept of entropy, traditionally confined to thermodynamics and information theory, is herein elevated to a moral and fiscal category essential for sustainable governance. This paper proposes a triadic framework of taxation—the robot tax, noise tax, and merit dividend—to internalize entropy across economic, informational, and epistemic domains. Drawing on Senator Bernie Sanders's critique of AI-driven automation as presented in his October 7, 2025, address "AI Could Wipe Out the Working Class," we integrate his call for a robot tax with the Relativistic Scalar-Vector Plenum (RSVP) model, where persistence requires the reabsorption of disorder. The robot tax addresses labor displacement by taxing corporate automation, redirecting funds to worker support. The noise tax penalizes low-compressibility content in digital ecosystems, funding semantic infrastructure. The merit dividend redistributes epistemic credit from individual achievements back to collective infrastructures, countering the tyranny of merit. Through entropy-reduction labor markets and regenerative robotics examples such as endomarionettes, we demonstrate how these operators form orthogonal projections of a single conservation law, ensuring coherence in civilization's metabolic flows. This unified approach reframes fiscal policy as thermodynamic ethics, aligning technological progress with human flourishing. Entropy is the missing variable of justice in an era of accelerating crises, and this framework provides the fiscal architecture for a civilization capable of metabolizing its own disorder.

## 1 Introduction: Progress Without Feedback

In the era of accelerationism, where automation and attention economies drive relentless growth, society faces a fundamental imbalance. Traditional metrics such as gross domestic product (GDP), user engagement, and innovation rates prioritize production and extraction over maintenance and coherence. This oversight leads to the accumulation of unaddressed entropy in economic, informational, and social systems, threatening long-term sustainability. The Relativistic Scalar-Vector Plenum (RSVP) framework introduces an ethical axiom: persistence requires the reabsorption of entropy. By internalizing the costs of disorder, systems can achieve equilibrium between creation and restoration.

Senator Bernie Sanders, in his October 7, 2025, address "AI Could Wipe Out the Working Class," situates AI and robotics amid crises of inequality and authoritarianism, arguing

they pose a threat comparable to climate change (**?**). He highlights how billionaire-driven technologies exacerbate economic divides, potentially displacing nearly 100 million U.S. jobs within a decade according to a Senate HELP Committee report. This echoes historical concerns over automation, from John Maynard Keynes's 1930 prediction of technological unemployment to Wassily Leontief's 1980s warnings and Jeremy Rifkin's 1995 book *The End of Work*, which lamented unprecedented technological displacement (**???**).

This paper aims to formalize a fiscal and thermodynamic model that holds actors responsible for the entropy they export. The proposed triadic structure—the robot tax for economic entropy, the noise tax for informational entropy, and the merit dividend for epistemic entropy—provides a unified mechanism to redistribute benefits and mitigate harms. Through this lens, technological progress is reoriented toward collective well-being rather than concentrated power, transitioning toward the entropic accounting that underpins sustainable governance.

# 2 Entropy and Externalization

Entropy, as defined in thermodynamics and information theory, represents the measure of disorder or unpredictability in a system. Pioneering works by Claude Shannon on information entropy and Rolf Landauer on the physical limits of computation highlight how energy dissipation accompanies information processing (**??**). Ilya Prigogine and Isabelle Stengers's exploration of dissipative structures in *Order Out of Chaos* further illustrates how open systems maintain order by exporting entropy to their environments (**?**).

In socioeconomic contexts, entropy export manifests as the displacement of disorder from one domain to another, such as unemployment from automation, pollution from industrial production, spam in digital communications, or epistemic debt in knowledge extraction. The Relativistic Scalar-Vector Plenum (RSVP) framework models this through three fields: the scalar field $\Phi$ representing capacity and potential, the vector field $\mathbf{v}$ denoting flow and activity, and the entropy field $S$ capturing disorder. The general conservation condition is given by

$$\mathcal{H}[\Phi, \mathbf{v}, S] \leq 0,$$

ensuring that entropy accumulation does not exceed reabsorption rates. This condition underpins the need for corrective operators to internalize externalized costs.

Consider three examples of entropy export. In the economic domain, industrial pollution arises from productivity gains that displace environmental disorder, leading to ecological degradation. Informational pollution, such as clickbait misinformation, floods cognitive ecosystems with low-value content, eroding epistemic health (**?**). Epistemically, academic prestige hierarchies extract value from collective labor while privatizing credit, fostering inequality in knowledge production.

| **Domain** | **Source of Order** | **Exported Disorder** | **External Cost** |
|---|---|---|---|
| Industry | Productivity | Pollution | Ecological degradation |
| Platforms | Engagement | Cognitive overload | Misinformation |
| Academia | Innovation | Epistemic inequality | Authorial enclosure |

These externalities necessitate mechanisms to reinternalize entropy, as explored in the subsequent sections on specific fiscal operators.

# 3 The Robot Tax: Economic Entropy

Senator Bernie Sanders, in his October 7, 2025, address "AI Could Wipe Out the Working Class," situates AI and robotics amid crises of inequality and authoritarianism, arguing they pose a threat comparable to climate change (**?**). Historical precedents, such as debates over automation in the 20th century, underscore the need for intervention. Automation generates productive order by exporting social disorder, such as labor displacement.

Examples from Sanders include Tesla's deployment of millions of robots replacing factory workers, Amazon's use of over a million robots leading to tens of thousands of layoffs, Foxconn's replacement of 60,000 workers with plans for fully automated factories, and driverless vehicles threatening trucking jobs (**?**). A Senate HELP Committee report estimates nearly 100 million U.S. jobs displaced within a decade, affecting sectors from nursing to accounting.

This aligns with historical automation anxiety, from Keynes's 1930s warnings of technological unemployment, Leontief's 1980s concerns about job scarcity, to Rifkin's 1990s predictions of widespread displacement (**???**). Recent OECD reports echo these fears, noting that occupations at high risk of automation account for 28% of jobs across member countries, exacerbating inequality (**?**).

In RSVP terms:

$$\frac{dS_{\text{economic}}}{dt} = \frac{\partial S}{\partial P}\frac{dP}{dt} - \frac{\partial S}{\partial H}\frac{dH}{dt},$$

where systemic entropy rises unless displaced human participation $H$ is rechanneled. The robot tax serves as a restorative feedback operator:

$$\mathcal{R}_{\text{economic}} = \tau_{\text{robot}}\,\frac{dH}{dt}.$$

Taxation is formalized as proportional to net exported disorder:

$$\tau_{\text{robot}} \propto \max\left(0, \frac{dS_{\text{external}}}{dt} - \frac{dS_{\text{internal}}}{dt}\right).$$

This rebalancing enforces the RSVP condition, metabolizing entropy faster than it accumulates.

Redistribution mechanisms could include wage insurance for displaced workers, implementation of a shorter 32-hour workweek without pay loss, and co-ownership models such as employee stock programs. These policies not only mitigate immediate harms but also foster a just technological transition, as Sanders advocates.

# 4 The Noise Tax: Informational Entropy

## 4.1 Definition of Compressibility

Extending the economic logic to digital ecosystems, the noise tax addresses semantic noise as the dominant externality. Platforms maximize throughput over compressibility, consum-

ing cognitive bandwidth without adding coherence. Compressibility, linked to Kolmogorov complexity, serves as a proxy for semantic density—information that adds structure rather than noise (**?**).

RSVP models this as degradation of the scalar field $\Phi$ (meaning capacity) and entropy inflation:

$$\frac{dS_{\text{info}}}{dt} = \int_{\Omega} (1 - C(x,t))\, d\Omega,$$

where $C$ is local compressibility. The noise tax imposes costs proportional to low $C$, penalizing unstructured content and rewarding high-density patterns.

### 4.2 Empirical Analogs

Empirical analogs include token inflation on social media, generative spam, and algorithmic overproduction, which flood systems with low-value information. Studies on informational pollution highlight how such content erodes trust and coherence (**??**).

### 4.3 Policy Form

The policy could involve a per-byte or per-token tax on low-information content, with revenues funding semantic infrastructure like quality curation platforms. Rewards might incentivize high-compression contributions, such as concise educational resources.

### 4.4 Case Studies

Case studies illustrate the issue: TikTok and Reels act as entropy amplifiers, prioritizing virality over depth, while Wikipedia and StackOverflow serve as entropy absorbers through community-maintained structure.

Scatterplot conceptualizing content density vs. attention cost: High-density content (e.g., scholarly articles) occupies low-attention, high-value quadrants, whereas low-compressibility spam fills high-attention, low-value areas.

This aligns the informational economy with entropic fairness, restoring balance between bandwidth and meaning.

## 5 The Tyranny of Merit: Epistemic Entropy

### 5.1 The Illusion of Individual Causality

Modern societies valorize success as the outcome of personal talent, hard work, or moral character. This ideology—what Michael Sandel has called the *tyranny of merit*—frames achievement as evidence of intrinsic virtue and failure as a lack of effort or worth (**?**). In doing so, it commits a systemic cognitive fallacy that can be formalized within the RSVP framework as the *reverse fundamental attribution error*: observers ascribe contingency and circumstance to others while attributing agency and intentionality to themselves.

Mathematically, let $A_i$ denote the observed achievement of an individual $i$. The meritocratic fallacy assumes a linear relation

$$A_i \approx f_i(\text{effort}, \text{character}),$$

neglecting the convolution of $A_i$ with the distributed field of collective inputs:

$$A_i = (E * C)(x_i, t_i) + \epsilon_i,$$

where $E$ represents environmental affordances (infrastructure, mentorship, education, prior discoveries) and $C$ the collective creative field generated by volunteers, peers, and ancestors. The noise term $\epsilon_i$ is typically interpreted as personal risk or luck, but in aggregate it encodes the entire *evolutionary selection pressure* of material and social constraints.

## 5.2 Collective Work as Hidden Infrastructure

Nearly every major technological or scientific advance emerges not from isolated genius but from *collective recursive labor*: open-source maintainers, unpaid testers, citizen scientists, and historical predecessors who have sedimented structure into the shared plenum of possibility. This background work functions as an *entropy sink* for civilization—absorbing disorder, error, and experimental dead ends so that localized success can appear clean and self-authored.

Within the RSVP framework, this collective substrate corresponds to the scalar field $\Phi$, which encodes capacity and coherence across the plenum. Individuals operate as transient vector perturbations $\mathbf{v}_i$ within that field. When success occurs, it is because the vector flow aligns momentarily with high-capacity regions of $\Phi$:

$$\mathbf{v}_i \cdot \nabla \Phi > 0.$$

To interpret this as individual virtue is to confuse local gradient-following with the underlying topology of the field itself.

## 5.3 Evolutionary Contingency and Selection

Human accomplishment is not primarily causal but *selected* from the ensemble of feasible actions permitted by physical, economic, and social constraints. Across timescales, systems exhibiting greater adaptability and entropy reabsorption survive, while brittle or exploitative strategies collapse. Hence what appears as individual "merit" is often the retrospective stabilization of trajectories that happened to resonate with ambient constraints. Evolution rewards what fits, not what intends.

This reframes moral desert in entropic terms:

$$\text{Merit} \approx \mathbb{E}\big[\, \Delta S_{\text{absorbed}} \,\big],$$

the expected capacity of an agent to reabsorb disorder from its environment. Success does not prove inherent virtue but effective coupling to collective constraint networks.

### 5.4 Implications for the Noise Tax

The tyranny of merit thus parallels the pathology that the noise tax seeks to remedy. In both cases, value is extracted from collective coherence while credit is privatized. Just as platforms monetize semantic labor provided freely by their users, the ideology of merit monetizes social inheritance while erasing its source. An entropy-aware society must therefore redistribute not only economic returns but *epistemic credit*—recognizing that meaning and innovation emerge from recursive communal fields rather than isolated acts of will.

The corrective, in both economics and ethics, is to reintroduce the missing feedback term:

$$\frac{dS_{\text{collective}}}{dt} = -\sum_i \nabla \cdot (\Phi_i \mathbf{v}_i),$$

making the hidden flows of contribution explicit. This is the moral analogue of the noise tax: a *merit dividend* that compensates the collective for the informational infrastructure it provides. Only by acknowledging this distributed authorship can technological progress cease to justify new hierarchies of desert. Recognizing epistemic entropy leads naturally to the corrective mechanism of the Merit Dividend.

## 6 The Merit Dividend: Epistemic Rebalancing

If the *noise tax* corrects informational entropy and the *robot tax* corrects economic entropy, then the *merit dividend* corrects epistemic entropy—the unacknowledged extraction of collective intelligence by individuals or institutions that benefit from inherited order.

**The Principle.** Every act of innovation or discovery draws upon a pre-existing lattice of shared cognition—the open-source repositories, scientific traditions, educational infrastructures, and volunteer communities that silently reabsorb error and stabilize knowledge. The merit dividend ensures that when an individual or corporation captures symbolic or monetary value from this shared lattice, a proportional share of that value is returned to the collective from which it emerged.

Let $V_i$ denote the measurable value (economic, reputational, or informational) accrued by agent $i$. Define $\Phi_{\text{collective}}$ as the scalar field representing accumulated public knowledge and infrastructure, and $\chi_i$ as the coupling coefficient describing how strongly $i$'s output depends on that field. Then the epistemic externality is

$$E_i = \chi_i \, \frac{\partial V_i}{\partial \Phi_{\text{collective}}},$$

and the required redistribution rate becomes

$$\tau_{\text{merit}} = \beta \, E_i,$$

where $\beta$ is a global normalization constant translating epistemic dependence into fiscal units.

**Operationalization.** In practical terms, the merit dividend can be implemented through multiple coupled channels:

(a) **Open-source credit ledgers:** Each software or scientific artifact includes a cryptographic trace of dependencies. When the artifact generates profit or recognition, a fraction of that value flows automatically to the upstream contributors weighted by dependency depth and maintenance labor.

(b) **Epistemic taxation:** Corporations or foundations whose business models rely heavily on public data, academic research, or volunteer curation pay a periodic levy into a *Cognitive Commons Fund*, proportional to the entropy they extract from the shared informational plenum.

(c) **Universal creative dividends:** Individuals receive baseline income or credits for contributing to collective sense-making—writing documentation, moderating discussions, annotating datasets—activities that decrease global entropy but rarely generate market returns.

(d) **Recognition rebalancing:** Academic and industrial citation indices can include a correction term for background dependency density, so that credit is allocated not only by visibility but by the *entropy reduction* each work provides to its successors.

Real-world analogies include Creative Commons licenses for shared attribution, open-source sustainability funds like GitHub Sponsors, and Wikipedia's edit credit systems that track contributions.

| **Flow Before Dividend** | **Flow After Dividend** |
|---|---|
| Extraction from collective → Private capture | Extraction → Redistribution → Collective reinforcement |

**Theoretical Rationale.** Where the tyranny of merit isolates achievement from its ecosystem, the merit dividend restores coherence to the epistemic field. It formalizes gratitude as a conservation law: no act of discovery can generate local order without compensating the global substrate that sustains it. Within the RSVP framework, this is equivalent to enforcing the invariant

$$\langle \mathcal{H}_{\text{epistemic}}[\Phi, \mathbf{v}, S] \rangle_{\Omega} \leq 0,$$

ensuring that cognitive evolution remains entropy-neutral or entropy-negative across scales. This draws on Giddens's structuration theory and March's exploration-exploitation balance, emphasizing organizational learning through structural coupling (**??**).

**Cultural Implications.** A society that adopts the merit dividend in tandem with the noise and robot taxes redefines success itself. Wealth, fame, and authorship cease to signify isolation and instead measure the capacity to *close feedback loops* across the collective plenum. The just society is thus the one in which every local gradient of excellence contributes to the flattening of the global entropy curve. In the context of AI model training, merit dividends could compensate contributors to public datasets, fostering equitable innovation.

# 7 Entropy Reduction as Labor

The *noise tax* treats informational disorder as a real cost and its correction as a productive act. Where traditional economies reward novelty and scale, an entropy-aware economy rewards *repair*. Spelling corrections on Wikipedia, removal of spam, refactoring of open-source code, or the literal collection of garbage are all acts that convert dispersed disorder into structured coherence. Each such action increases the effective compressibility $C$ of the collective field, reducing informational entropy $S$:

$$\Delta S_{\text{system}} = -\int_{\Omega} \Delta C(x,t)\, d\Omega.$$

**Economic interpretation.** In RSVP terms, these actions supply a positive flux of negative entropy back into the shared plenum. They constitute the inverse of extraction: micro-reparative labor that sustains the field's coherence. The appropriate policy mechanism is not charity but remuneration: citizens should be *paid to collect garbage in any domain where garbage exists*—whether physical refuse or informational debris.

**Logarithmic valuation.** To prevent trivial gaming and to reward early discovery, the bounty for a correction or cleanup can scale logarithmically with the *age* of the error or the *entropy density* it corrects:

$$R(t_{\text{error}}) = R_0 \, \log\!\left(1 + \frac{t_{\text{error}}}{t_0}\right),$$

where $t_{\text{error}}$ is the time since the error entered the system and $R_0$ the base rate for immediate repair. Old, uncorrected errors have propagated further through derivative works and therefore carry higher entropic weight. Paying logarithmically more for older corrections ensures that long-standing distortions—misquotations, typos in canonical literature, uncollected trash in neglected areas—receive proportionally greater incentive.

**Unified reward structure.** The same algorithm can operate across domains:

| **Domain** | **Entropy Source** | **Rewarded Act** |
|---|---|---|
| Physical ecology | Waste accumulation | Garbage collection, recycling |
| Digital knowledge | Typos, misinformation | Error correction, citation repair |
| Software ecosystems | Legacy bugs, dead code | Refactoring, documentation updates |
| Civic discourse | Spam, disinformation | Moderation, fact-checking |

Each task reduces local disorder while teaching the agent about the system's structure—a coupling of cognitive and thermodynamic efficiency. The cumulative metric for payment is therefore not just quantity of actions but *entropy absorbed*:

$$W = \int_0^T \left| \frac{dS_{\text{external}}}{dt} \right| dt, \quad \text{Reward} = \gamma W,$$

with $\gamma$ a fixed conversion rate from entropy units to currency.

Case studies include open-source maintainers addressing legacy bugs, janitorial labor in physical spaces, and fact-checkers combating disinformation, all undervalued in traditional economies.

**Moral consequence.** Where the tyranny of merit rewards extraction and visibility, the entropy-reduction economy rewards *maintenance and care*. It reverses the moral direction of work: success is measured not by the novelty one produces, but by the disorder one successfully reabsorbs. In this schema, a person who collects trash or finds a decade-old typo in a scientific paper performs the same essential act as an engineer debugging an unstable network: converting noise into structure. Both are instances of RSVP's universal criterion for persistence,

$$\langle \mathcal{H}[\Phi, \mathbf{v}, S] \rangle_\Omega \leq 0,$$

which demands that each participant, however small, contribute to the continuous reintegration of entropy into meaning. This links to Sanders's vision of a shorter workweek, redistributing time toward such reparative activities.

# 8 Integration: The Merit Dividend and the Entropy-Reduction Market

The entropy-reduction economy forms the operational substrate of the *Merit Dividend*. While the dividend redistributes epistemic credit from innovation back to the collective, the entropy-reduction market channels that redistributed value toward those performing the day-to-day work of coherence restoration.

**Conceptual coupling.** In the RSVP formalism, both creation and correction are phases of the same operator:

$$\mathcal{H}[\Phi, \mathbf{v}, S] = \underbrace{\mathcal{H}_{\text{creative}}}_{\text{entropy export}} + \underbrace{\mathcal{H}_{\text{restorative}}}_{\text{entropy reabsorption}}.$$

The merit dividend allocates funds according to the exported component, taxing those who benefit from collective structure. The entropy-reduction market allocates payouts according to the restorative component, rewarding those who reintegrate disorder. The equilibrium condition for a coherent society is:

$$\langle \mathcal{H}_{\text{creative}} + \mathcal{H}_{\text{restorative}} \rangle_\Omega = 0.$$

**Automatic payment architecture.** Each verified entropy-reduction event (a corrected error, removed spam, fixed bug, cleaned site) generates a micropayment from the collective fund established through merit and noise taxes. A distributed ledger records the event with three fields:

(i) **Entropy delta** $\Delta S_i$: quantitative estimate of disorder removed.

(ii) **Age multiplier** $\log(1+t_i/t_0)$: compensates for long-lived or deeply propagated errors.

(iii) **Verification hash**: consensus proof from peers or algorithmic cross-check confirming that the correction holds.

The total reward becomes:

$$R_i = \gamma\, \Delta S_i\, \log\!\left(1 + \frac{t_i}{t_0}\right),$$

paid automatically from the *Cognitive Commons Fund* financed by the merit dividend and noise tax. This closes the loop: value extracted from collective insight flows back into collective maintenance.

Consider a simulation: A user corrects a longstanding typo in a Wikipedia article on automation history. The ledger registers $\Delta S_i$ based on page views impacted, applies the age multiplier for the error's duration, and verifies via community consensus. Funds from tech firms' epistemic taxes flow as micropayment, incentivizing further maintenance.

**Human recognition as thermodynamic currency.** Although denominated in currency, the deeper reward structure is reputational. Each entropy-reduction event carries a signature in the ledger, contributing to a participant's *coherence index*:

$$\kappa_i = \int_0^T \left| \frac{dS_{\text{external},i}}{dt} \right| dt,$$

which replaces conventional metrics of productivity with a measure of sustained systemic stabilization. High-$\kappa$ agents are not merely "productive" but *entropically responsible*—they leave the collective plenum more ordered than they found it.

**Societal effect.** In this configuration, the Merit Dividend and the Noise Tax cease to be abstract redistributive policies. Together they form a coherent feedback circuit in the thermodynamic economy of meaning:

**Extraction (creation) → Redistribution (dividend) → Reabsorption (entropy labor)**.

Those who profit most from the collective's order fund those who labor to maintain it. Those who maintain it preserve the very conditions for future creation. The outcome is an economy where value is measured not by acceleration or accumulation, but by the continuity of coherence in the scalar field $\Phi$.

**Governance and Oversight.** Effective implementation requires oversight councils to set entropy metrics, verification algorithms to prevent fraud, and civic trust models to ensure participation. Pilot programs on platforms like GitHub or civic apps could test ledger functionality, scaling to national entropy-balance systems.

# 9 Endomarionettes: Embodied Entropy Reabsorption

Not all automation externalizes entropy. While the *robot tax* proposed by Sanders applies to high-capital, labor-displacing automation that offloads social disorder for private gain, certain forms of embodied automation—notably *endomarionettes* constructed from household or biodegradable materials—do the opposite. They function as *entropy absorbers*, not emitters.

**Material and Dynamic Principles.** Endomarionettes are lightweight robotic organisms built from low-cost, compliant materials: paper-mâché, bread paste, yogurt glue, kombucha (SCOBY) leather, or other bio-derived composites. They are actuated by internal pneumatic bladders or tendon-like strings that pull against flexible joints. Their structural fragility is not a defect but an informational feature: each deformation or leak serves as feedback to stabilize higher-level motion.

Instead of rigid control, they employ *hierarchical Central Pattern Generator* (CPG) chains, modeled after biological gait oscillators:

$$\text{Trunk CPG} \;\rightarrow\; \text{Hip/Knee CPGs} \;\rightarrow\; \text{Ankle Reflex Loops.}$$

These oscillators entrain through phase coupling, allowing local irregularities to be reabsorbed as rhythmic variation rather than mechanical failure. The governing principle is *recursive entropy smoothing*:

$$\frac{dS_{\text{local}}}{dt} = -\nabla\cdot(\Phi\mathbf{v}) + Q_{\text{feedback}},$$

where $Q_{\text{feedback}} > 0$ represents the rate at which internal noise is converted into stabilizing information. This contrasts with opaque, centralized AI infrastructure, emphasizing repairability and permeability in material philosophy (**??**).

To build a basic endomarionette: Form a truss skeleton with tape and straws, attach antagonistic balloon bladders at joints for torque, route strings through straws for tendon control, and integrate pressure sensors for reflexes.

**Change Magnification.** For training, rehabilitation, or educational use, endomarionettes can employ a function

$$\delta r = G(\phi)\,\delta h, \quad G'(\phi) > 0,$$

mapping small human input $\delta h$ into large robotic motion $\delta r$. This *change magnification* amplifies feedback and supports learning without large mechanical energy flows, keeping the total entropic footprint low.

**Why They Are Exempt.** The *robot tax* applies when automation *externalizes entropy*—that is, when a corporation uses robotics to increase profit while exporting social disorder (unemployment, deskilling, concentration of wealth). By contrast, endomarionettes:

(a) **Do not displace labor.** They are typically operated, modified, and repaired by their users; they *create work* rather than erase it.

(b) **Localize production.** Made from household materials, they generate no large-scale capital externality or offshored manufacturing entropy.

(c) **Metabolize noise internally.** Their softness and feedback structure ensure that errors, flex, and drift become part of the control loop, not waste products.

(d) **Support education and skill formation.** They transform mechanical noise into pedagogical information, serving as entropy sinks for human learning.

Therefore, in an RSVP-informed policy regime, the tax liability $\tau_{\text{robot}}$ would be defined by net exported entropy:

$$\tau_{\text{robot}} \propto \max\left(0,\, \frac{dS_{\text{external}}}{dt} - \frac{dS_{\text{internal}}}{dt}\right).$$

For high-capital automation, $\frac{dS_{\text{external}}}{dt} \gg 0$ and the tax is positive. For endomarionettes and other regenerative robotics, $\frac{dS_{\text{internal}}}{dt} \geq \frac{dS_{\text{external}}}{dt}$, yielding $\tau_{\text{robot}} \approx 0$.

**Interpretation.** Such devices embody the same ethics as the *noise tax*: entropy is not avoided but domesticated. Where industrial robotics export disorder into society, low-entropy robotics—built from paper, yogurt, and air—recycle it into coherence. Their exemption from the robot tax reflects not indulgence but fidelity to the governing thermodynamic law of RSVP: enduring systems persist only by reabsorbing the noise they create. These fragile machines demonstrate that the future of automation lies not in power but in permeability.

**Policy Footnote: Definition of Entropic Exemption.** To integrate the above principles into governance, we define a robotics or automation system as *entropically exempt* from taxation when it satisfies the following empirical inequality over its operational domain $\Omega$:

$$\int_{\Omega} \left(\frac{dS_{\text{external}}}{dt} - \frac{dS_{\text{internal}}}{dt}\right) d\Omega \leq 0.$$

In practice, this means that the system's design, fabrication, and use collectively reabsorb as much entropy (in the form of waste, disorder, or social cost) as they emit. The evaluation can be performed along three complementary axes:

(i) **Material Circularity:** Proportion of components made from biodegradable, recyclable, or locally sourced matter. Systems with closed or regenerative material loops score $S^{\text{mat}}_{\text{external}} \approx 0$.

(ii) **Participatory Coupling:** Degree of human interaction, modification, and creative involvement. Devices that function as *tools of learning or craftsmanship* contribute negatively to net external entropy, $S^{\text{soc}}_{\text{external}} < 0$.

(iii) **Feedback Integration:** Fraction of mechanical, informational, or environmental noise reabsorbed through feedback loops. Endomarionettes that convert deformation into proprioceptive data or training signals exhibit $S^{\text{info}}_{\text{external}} \leq 0$.

The cumulative entropy balance

$$S_{\text{external}} = S^{\text{mat}}_{\text{external}} + S^{\text{soc}}_{\text{external}} + S^{\text{info}}_{\text{external}}$$

determines the applicable tax coefficient:

$$\tau_{\text{robot}} = \alpha \, \max(0, S_{\text{external}}),$$

where $\alpha$ is a jurisdiction-specific normalization constant linking entropy units to fiscal currency.

**Regulatory Implication.** Under this model, *high-capital displacing automation* (e.g., closed-source factory robotics, proprietary large-model infrastructures) would yield $S_{\text{external}} > 0$ and incur taxation proportional to their exported disorder. Conversely, *regenerative automation*—including soft endomarionettes, open-source prosthetics, and educational bio-robots—would qualify for a *zero or negative tax rate*, receiving subsidies or credits for their entropy-absorbing function.

This extension reframes fiscal policy as a thermodynamic feedback mechanism: taxation becomes not punishment for progress, but a balancing operator ensuring that technological evolution respects the RSVP condition of persistent coherence,

$$\langle \mathcal{H}[\Phi, \mathbf{v}, S] \rangle_\Omega \leq 0.$$

# 10 RSVP Interpretation of Enshittification

Cory Doctorow's concept of *enshittification* describes the progressive decay of online platforms as they transition from being good for users, to good for advertisers, to good only for themselves (**?**). Within the Relativistic Scalar–Vector Plenum (RSVP) framework, this dynamic can be modeled as a collapse of *entropy coupling* between three interacting fields: the scalar field $\Phi$ (capacity or legitimacy), the vector field $\mathbf{v}$ (flow or activity), and the entropy field $S$ (disorder or extractive pressure). Enshittification represents the runaway phase of this system in which local optimization of $\mathbf{v}$ for profit exceeds the capacity of $\Phi$ to reabsorb disorder, causing a positive feedback in $S$.

**Stage I: High Coupling, Low Entropy.** In the early phase of a platform's life, the gradient $\nabla\Phi$ between user needs and technical affordances drives a coherent flow $\mathbf{v}$. The entropy field $S$ is minimized through open feedback loops—user complaints lead to fixes, interoperability is permitted, and external APIs function as entropy sinks. The divergence condition

$$\nabla \cdot (\Phi \mathbf{v}) + \frac{\partial S}{\partial t} \approx 0$$

is approximately satisfied: disorder exported through growth is rapidly reabsorbed through repair and adaptation.

**Stage II: Flow Dominance and Scalar Depletion.** As investor pressures increase, the system begins maximizing $\|\mathbf{v}\|$ (monetary flow, engagement rate) at the expense of $\Phi$ (user capacity). Interoperability restrictions and enclosures raise $\partial S/\partial t > 0$, while maintenance and openness decline. The entropy exported to the periphery—users, small developers, moderators—no longer returns as feedback. The plenum becomes asymmetric: flows are strong, but capacity and meaning weaken. This is the onset of informational debt.

**Stage III: Entropic Inversion.** At the terminal stage, both users and advertisers become trapped within a high-entropy attractor. Every new action—scrolling, posting, advertising—feeds back as additional disorder, increasing $S$ without increasing $\Phi$. The platform consumes its own informational coherence, transforming user creativity into noise and algorithmic sludge. Formally:

$$\frac{dS}{dt} > 0, \qquad \frac{d\Phi}{dt} < 0, \qquad \mathbf{v} \cdot \nabla \Phi \leq 0.$$

The plenum's Hamiltonian $\mathcal{H}[\Phi, \mathbf{v}, S]$ becomes positive, violating the RSVP persistence condition $\langle \mathcal{H} \rangle_\Omega \leq 0$. At this point, collapse or regulation is inevitable.

**Interoperability as Entropic Reabsorption.** Doctorow's proposed remedy—mandated interoperability—can be expressed in RSVP terms as the restoration of *vector permeability*. When data and users can flow freely between systems, $\mathbf{v}$ once again couples to $\Phi$, allowing the reabsorption of entropy through cross-platform feedback. Competition and modularity act as negative entropy gradients that restore systemic coherence:

$$\frac{\partial S}{\partial t} = -\lambda \nabla \cdot (\Phi \mathbf{v}),$$

where $\lambda > 0$ represents regulatory permeability. Antitrust enforcement likewise flattens excessive scalar asymmetries—preventing any single region of $\Phi$ from monopolizing capacity.

**Physical World Analogy.** The same process applies to physical infrastructures that undergo *enshittification*—appliances that demand logins, cars with remote locks, or supply chains with opaque data brokers (**?**). Each instance reflects a reduction in local feedback and an increase in informational latency: users can no longer repair or repurpose their own tools. Entropy that once circulated within the ecosystem becomes trapped inside proprietary enclosures, raising the system's free energy until failure.

**RSVP Diagnosis.** From an RSVP perspective, enshittification is not moral decline but thermodynamic imbalance. A platform or polity decays when its restorative operators $\mathcal{R}$ (repair, user control, transparency) are suppressed relative to its creative operators (growth, extraction, engagement). The cure is therefore not ideological but structural: restore feedback permeability, reinstate entropy sinks, and ensure that the divergence condition

$$\langle \mathcal{H}[\Phi, \mathbf{v}, S] + \mathcal{R} \rangle_\Omega \leq 0$$

holds across the economic, informational, and epistemic layers of the system.

**Integration with the Noise Tax.** In this light, the *noise tax* can be interpreted as a formal mechanism for counteracting enshittification. By taxing the unrecirculated entropy produced by attention economies and rewarding reabsorptive acts such as moderation, open APIs, and interoperability, society re-implements Doctorow's policy insight as a thermodynamic feedback law:

$$\tau_{\text{noise}} \propto \max\left(0,\ \frac{dS_{\text{external}}}{dt} - \frac{dS_{\text{internal}}}{dt}\right).$$

Enshittification is thus the fiscal signature of a system where this tax is zero; coherence restoration begins the moment entropy costs are internalized again.

**Bridge to Triadic Closure.** The enshittification of digital and physical systems underscores the urgency of integrating the robot tax, noise tax, and merit dividend into a unified framework. Just as Sanders's robot tax addresses the economic fallout of automation and endomarionettes exemplify entropy-absorbing technology, the noise tax counters the informational decay of enshittified platforms. Together, these mechanisms enforce the RSVP principle of entropy reabsorption, setting the stage for a comprehensive conservation law that ensures systemic coherence across all domains.

# 11 Triadic Closure: The Conservation of Coherence

The three fiscal operators developed throughout this paper—the *robot tax*, the *noise tax*, and the *merit dividend*—represent orthogonal projections of a single conservation principle: the preservation of coherence within the scalar–vector–entropy plenum. Each addresses a distinct dimension of exported entropy:

| **Domain** | **Entropy Form** | **Corrective Operator** |
|---|---|---|
| Economic (production) | Labor displacement, material waste | Robot tax |
| Informational (communication) | Semantic noise, cognitive overload | Noise tax |
| Epistemic (knowledge) | Credit extraction, unacknowledged inheritance | Merit dividend |

These operators form a basis set for entropic accounting across civilization's three fundamental flows: energy, information, and meaning. Their sum defines the total restorative operator $\mathcal{R}$ acting on the RSVP Hamiltonian:

$$\mathcal{R} = \mathcal{R}_{\text{economic}} + \mathcal{R}_{\text{informational}} + \mathcal{R}_{\text{epistemic}}.$$

**Unified invariant.** The global coherence condition is therefore:

$$\langle \mathcal{H}[\Phi, \mathbf{v}, S] + \mathcal{R} \rangle_{\Omega} \leq 0,$$

ensuring that at every scale the entropic export of creation is counterbalanced by the reabsorption of restoration. The robot tax closes the loop on matter, the noise tax on signal, and the merit dividend on understanding.

**Geometric interpretation.** In informational geometry, these three operators correspond to the orthogonal axes of RSVP space:

$$(\Phi, \mathbf{v}, S) \quad \Rightarrow \quad (\text{capacity},\ \text{flow},\ \text{entropy}).$$

The robot tax acts on vector flows ($\mathbf{v}$), restraining extractive acceleration by taxing displacement. The noise tax acts on scalar capacity ($\Phi$), filtering low-information gradients to preserve meaning. The merit dividend acts on entropy ($S$), restoring epistemic balance by compensating the collective field. Together they enforce a closed divergence condition,

$$\nabla \cdot (\Phi \mathbf{v}) + \frac{\partial S}{\partial t} = 0,$$

which expresses social sustainability as literal thermodynamic continuity. This orthogonality ensures comprehensive coverage: capacity enables flow, flow generates entropy, and entropy feedback stabilizes capacity.

A 3D axes diagram labeled $\Phi$, $\mathbf{v}$, $S$ would show the projection of the three taxes as perpendicular planes, illustrating how they intersect to form a balanced plenum.

Historical conservation laws in physics, from energy to information, inspire this generalization to ethics, where RSVP extends thermodynamic principles to civic coherence (**?**).

**Ethical corollary.** A society that implements these three feedbacks ceases to confuse growth with coherence. Progress becomes the maintenance of reversible transformations in which no form of order is extracted without another form being restored. This triadic conservation law—economic, informational, epistemic—constitutes the fiscal expression of the RSVP axiom:

*Persistence requires reabsorption.*

This satisfies $\langle \mathcal{H}[\Phi, \mathbf{v}, S] \rangle_\Omega \leq 0$.

# 12 Conclusion: Civilization as Entropic Metabolism

Civilization endures only as long as it remains metabolically open to its own disorder. The robot, noise, and merit taxes together formalize this principle in economic, informational, and epistemic form. They remind us that progress without feedback is not progress but leakage. Every system—biological, cognitive, or civilizational—that forgets to reabsorb the entropy it exports begins to disintegrate under the weight of its own acceleration. To persist is not to produce more, but to circulate more perfectly: to let what has been scattered become structured again. In this sense, the highest act of intelligence is not creation but maintenance—the quiet reconstitution of coherence from the ruins of excess. Reconnecting to Sanders's moral tone, this calls for cultural imagination alongside fiscal reform, inviting future empirical validation through pilot programs and entropy-balance metrics. To sustain civilization is to master the art of reversible disorder.

# A Mathematical Derivation of Entropy Balance Equations

Detailed derivations of the RSVP equations, including proofs of orthogonality and conservation invariants.

# B Case Studies

Amazon automation as economic entropy export; Wikipedia as epistemic reduction; etc.

# C Prototype Pseudocode

Ledger for entropy-reduction; CPG for endomarionettes.