

# SBCM Economics Part 2: Dynamic Meso-Economics and the Thermodynamics of Governance

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— From Static Algebra to Dynamic Calculus: The Thermodynamics of Administrative Ruin —

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## Abstract

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Traditional macroeconomics has treated the nation state as a rigid body, ignoring internal structural fatigue. This study updates the "Meso-Economics" framework proposed in v1 by introducing the concept of **Time** (

$t$ ) and **Infinity** ( $\infty$ ).

By evolving the Standard Block Comparison Method (SBCM) from static algebra to **dynamic calculus**, we prove that current fiscal policies in depopulating nations are mathematically equivalent to a "Ponzi scheme." Furthermore, we define "**Algorithmic Public Interestism**," a new governance protocol that replaces moral-based policy with physics-based constraints.

# 1. Introduction: "In the Beginning Was the Logic"

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Why do administrative policies fail? Because they rely on "Words" (Rhetoric/Morality) rather than "Logic" (Physics/Math).

As stated in the foundational axiom of the SBCM Alliance: "*In the beginning was the Logic.*" Governance is not an art; it is an engineering problem governed by the laws of thermodynamics.

This paper aims to establish the "**Equations of Motion for Governance**" to predict and prevent the inevitable collapse of local municipalities.

## 2. Theoretical Upgrade: The Calculus of Distortion

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### 2.1 The Limitation of Static Algebra (v1)

In v1, we defined the Budget Distortion Index (

$D_{index}$ ) as a snapshot:

$$D_{index} = \frac{I_{budget}}{I_{coverage}}$$

This effectively detects instantaneous waste. However, it fails to account for "**Future Liabilities**" (e.g., maintenance costs of bridges in 2050).

### 2.2 The Cumulative Distortion Integral (v2)

To evaluate the true burden, we must integrate the distortion over the lifespan (

$T$ ) of the project. We define the **Cumulative Distortion** ( $D_{total}$ ):

$$D_{total} = \int_0^T \frac{C_{maint}(t)}{P_{block}(t)} dt$$

- $C_{maint}(t)$ : Maintenance cost at time  $t$  (Monotonically increasing due to aging).
- $P_{block}(t)$ : Population of the Standard Block at time  $t$  (Monotonically decreasing in Japan).

### Theorem 1 (The Divergence of Burden):

Since the numerator increases and the denominator decreases, the integrand approaches infinity. Thus, even a project with

$D_{index} \approx 1$  today can result in  $D_{total} \rightarrow \infty$ . This proves that **"debt financing for infrastructure in a shrinking population is mathematically impossible."**

## 2.3 The Limit of Municipal Lifespan

We can mathematically predict the "Date of Death" (

$t_{death}$ ) of a municipality. It is the point where the per-capita burden exceeds the taxable limit ( $\tau_{limit}$ ):

$$\lim_{t \rightarrow t_{death}} \frac{\text{Total Cost}(t)}{P_{block}(t)} > \tau_{limit}$$

SBCM 2.0 acts as a "Doomsday Clock," calculating

$t_{death}$  for all 1,718 municipalities in real-time.

### 3. The Physics of Economy: Conservation of Pain

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#### 3.1 Newton's Third Law of Administration (Action and Reaction)

Macroeconomists often claim, "Government spending stimulates the economy." This violates the Law of Conservation of Mass.

In a closed Standard Block system, every unit of government revenue is a subtraction from private wealth.

$$\Delta G_{revenue} = - \Delta P_{wealth}$$

- **The Illusion of the Moon (Macro):** For the state (Mass  $M$ ), a tax hike of 1 billion JPY is negligible ( $\mathcal{A} \approx 0$ ).
- **The Pain of the Apple (Micro):** For the household (Mass  $m$ ), the same force creates a crushing acceleration ( $a \gg 0$ ).

#### Theorem 2 (Conservation of Pain):

Taxation does not vanish; it transfers "Pain" from the dispersed public to the concentrated state. Any policy that ignores this micro-level pain (

$a$ ) is thermodynamically invalid.

#### 3.2 The Entropy of Leakage (The Straw Effect Revisited)

Without structural barriers, wealth naturally flows from low-gravity areas (Rural) to high-gravity areas (Tokyo/Major Corporations).

We define

$R_{block}$  (**Retention Rate**) as the coefficient of "Insulation."

- **Low  $R_{block}$ :** High thermal conductivity. Energy (Tax) injected into the block instantly dissipates to the outside.

- **High  $R_{block}$**  : Adiabatic process. Energy circulates internally, maximizing work.

## 4. Proposal: Algorithmic Public Interestism

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### 4.1 Redefining "Public Interest"

Traditional "Public Interest Capitalism" relies on the **morality** of leaders.

However, history proves that morality is fragile.

We propose "**Algorithmic Public Interestism**": A system where public interest is enforced not by ethics, but by **protocol**.

### 4.2 The G-Cart Protocol

To implement this, we propose the "**G-Cart**" system (Virtual General Contractor).

- **Mechanism:** An algorithmic procurement system that automatically rejects any project where:
  1.  $D_{total}$  exceeds the sustainability threshold.
  2.  $R_{block}$  falls below the local circulation target.

This ensures that corruption is not just "illegal" but "**computationally impossible**."

## 5. Conclusion

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SBCM Economics 2.0 demonstrates that the collapse of regional economies is not a political accident but a **mathematical inevitability** caused by ignoring the calculus of population dynamics.

By adopting this framework, we move from "Managing Growth" (which is over)

to "Managing Metabolism."

The future of governance lies not in the hands of politicians, but in the **Logic** that governs the block.

## References

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1. **Koyama, H. (2025).** *Proposal for the Standard Block Comparison Method (SBCM).* v2.
2. **SBCM Alliance.** (2025). *G-Cart: The Algorithmic Procurement Protocol.* GitHub.
3. **Newton, I.** (1687). *Philosophiæ Naturalis Principia Mathematica.* (Applied to Administrative Dynamics).

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