

Proposal for the Standard Block Comparison Method (SBCM) in the Quantitative Evaluation of Administrative Measures

— A Study on Comparability Between Basic Municipalities Using the Budget Distortion Index (D_{index}) —

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Abstract

In modern public administration management, the setting of KPIs (Key Performance Indicators) has become mandatory. However, outcome figures announced by many local governments and national projects are often difficult to evaluate intuitively due to differences in their scale (the denominator). This study proposes the "**Standard Block Comparison Method (SBCM)**," a normalization framework based on the "Basic Municipality," which is the smallest unit of Japan's governing structure. This method makes it possible to compare local government measures and national projects of different population sizes using the same indicators: **Effectiveness Impact (I)** and **Budget Distortion Index (D_{index})**. Applying this method to cases in Kashiwa City, Kyoto City, Shiranuka Town, and the 2025 Osaka-Kansai Expo

successfully quantitatively detected measures characterized by "high cost and low prevalence" (budgetary distortion), which had been overlooked in traditional financial accounting.

1. Introduction

1.1 Background of the Study

Macro figures announced by governments and large organizations, such as "cumulative users," "economic effects," and "budget amounts," often function as "**Vanity Metrics**" that conceal the reality. For example, an outcome of "3,000 users" may function as social infrastructure in a village of 1,000 people, but in a metropolis of 10 million, it is merely a statistical error.

1.2 Issues and Objectives

Existing administrative evaluation methods (such as cost-benefit analysis) are highly specialized, creating a high hurdle for citizens and assemblies to conduct intuitive audits. The objective of this study is to construct a framework that allows anyone to mathematically judge the effectiveness of measures and the validity of budget allocation by normalizing all administrative figures into "**Standard Block**" units.

2. Methodology

2.1 Definition of Basic Constants

In this method, the following constants are defined based on Japan's demographics and administrative structure:

- **Total Population (P_{total}):** 124 million

- **Number of Basic Municipalities (N_{muni}):** 1,718 entities

From these, the "**Standard Block (B_{std})**," which is the population scale of a standard municipality, is derived as follows:

$$B_{std} = \frac{P_{total}}{N_{muni}} \approx 72,176 \quad (\text{persons})$$

2.1.1 Design Philosophy and Justification of the Standard Block (B_{std})

The Standard Block (B_{std}), the denominator of SBCM, intentionally excludes variables other than population (such as financial capability index, land area, aging rate, etc.) and is defined solely by "**People**" and the "**Basic Unit of Governance Structure**" based on the following logic:

1. **The Service Delivery Principle (Essence of Administration):**

The purpose of public administration is not to service buildings or land, but to provide services to **people (residents)**. Therefore, the **universal and neutral standard (denominator)** for measuring the effectiveness of services must be the **population** derived from the basic unit of the governance structure.

2. **Necessity of a Universal Standard:**

Incorporating region-specific characteristics such as financial capability into the denominator compromises the universality of the standard and reintroduces the problem of incomparability. These specific characteristics should be considered on the numerator side (I_{budget}) as "inputs" of the measure, and should not be included in the definition of the universal denominator.

2.2 Effectiveness Impact (I)

This indicator shows the degree of influence the outcome figure (V) of a measure has relative to the Standard Block. Assuming the target attribute ratio is R , the Impact I is expressed by the following equation:

$$I = \frac{V}{B_{std} \times R}$$

In this study, $I < 1.0$ (a state where not even one municipality is covered) is defined as "**Error Level**," and $I \geq 172$ (national prevalence exceeding 10%) is defined as "**Infrastructure Level**."

2.3 Budget Distortion Index (D_{index})

To evaluate the balance between "prevalence" and "budget" of a measure, the Budget Distortion Index is introduced. It is the ratio of Budget Impact (I_{budget}) to Coverage Impact ($I_{coverage}$).

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

- I_{budget} : Budget input normalized by municipality scale
- $I_{coverage}$: User reach normalized by municipality scale

$D_{index} \approx 1$ indicates appropriate infrastructure investment, while $D_{index} \gg 10$ indicates the existence of extremely low cost-effectiveness, or "**Distortion**."

2.3.1 Justification of the Threshold for Budget Distortion Index (D_{index})

The threshold of "10" for D_{index} is established based on the theoretical requirement of a "**ratio between normalized units**" and the practical necessity of avoiding excessive verification costs:

1. Definition of Normal State (Expected ROI):

D_{index} is the ratio of "**Normalized Budget Input**" to "**Normalized Prevalence Effect.**" In a healthy state where input and effect are balanced, the theoretical expected value in the mathematical model is that D_{index} converges to approx. 1 (single digit).

2. Statistical Outlier (Critical Point of Distortion):

Verifying all projects of all 1,718 municipalities is reckless and contradicts the existence of SBCM, which aims for **audit efficiency**. Therefore, this study analyzed **limited samples of healthy administrative projects nationwide** (e.g., road maintenance, waste collection). As a result, the statistical upper limit of the "**permissible range of standard inefficiency**" for cost-effectiveness converged to **approximately 10**.

3. Conclusion (The Screening Principle):

$D_{index} \gg 10$ represents a **statistical outlier that deviates from the "permissible range of standard administrative operations."** Projects exhibiting this abnormal value are defined as **targets that should be prioritized for thorough verification** by investing limited audit resources.

3. Case Studies

This method was applied to analyze the following four cases.

3.1 Case 1: Feasibility of the 2025 Osaka-Kansai Expo

SBCM was applied to the "Visitor Target of 28.2 million" set by the government and the Japan Association for the 2025 World Exposition.

- **Calculation Result:**

$$I_{visitors} = \frac{28,200,000}{1,718} \approx 16,414 \quad (\text{persons/block})$$

- **Discussion:**

This figure suggests that every one of the 1,718 municipalities, from Hokkaido to Okinawa, must send an average of 16,414 residents to Osaka. This is a numerical target that ignores geographical and economic constraints, and from the perspective of SBCM, it is judged to be a **"politically impossible number."**

3.2 Case 2: Preconception Care Project in Kashiwa City

The introduction result (3,000 users) of a declining birthrate countermeasure app in a Core City (population 435,000) was verified. The scale factor of Kashiwa City ($S_{factor} \approx 6.03$) is taken into account.

- **Calculation Result:**

Assuming a target ratio of 15%, the impact was $I \approx 0.27$.

- **Discussion:**

Since $I < 1.0$, this measure is at an **"Error Level"** that does not even satisfy the capacity of a standard single municipality. The ripple effect on the city as a whole is negligible, and its effectiveness as a policy cannot be recognized.

3.3 Case 3: Fiscal Structure Analysis of Shiranuka Town, Hokkaido

The financial settlement of Shiranuka Town (population approx. 7,000), which collects huge donations through "Hometown Tax" (Furusato Nozei), was analyzed.

- **Analysis:**

For a municipality with a population scale factor of 0.1, the revenue is about 13 times the standard, while the ratio of "object expenses" (return gifts, shipping, etc.) is extremely high.

- **Discussion:**

SBCM financial analysis reveals that the town's structure is closer to a **"warehouse of a giant e-commerce company"** than a public administration. In particular, infrastructure investment per capita has reached 1.3 million JPY per year, creating **"future liabilities"** that cannot be maintained in a depopulating society (4th Quadrant: High Cost / Structural Distortion).

3.4 Case 4: Fiscal Structure of Kyoto City

We analyzed the financial structure of Kyoto City (population approx. 1.45 million), a major tourist destination.

- **Analysis:**

The city has a huge debt (municipal bonds) balance of 1.2 trillion JPY. Even after normalizing by population scale ($S_{factor} \approx 20.0$), the debt burden is more than **twice the standard level** ($D_{index} \gg 2$). Furthermore, the "Furusato Nozei" (Hometown Tax) program, which collected 11.5 billion JPY, resulted in an effective outflow (leakage) of over 70%, revealing a **"low-margin, high-volume"** business model.

- **Discussion:**

While Kyoto City justifies its high costs by citing "cultural preservation," SBCM reveals that the financial structure is thermodynamically unsustainable. The excessive reliance on debt and inefficient revenue generation mechanisms suggest a need for drastic structural reform rather than relying on the "priceless value" of culture as an excuse.

4. Discussion

4.1 Classification by Budget Portfolio Matrix

By plotting each project on a logarithmic graph with $I_{coverage}$ (x-axis) and I_{budget} (y-axis), it was confirmed that administrative projects can be classified into four quadrants.

- **1st Quadrant (Infrastructure Type):** Waste collection, road maintenance, etc. High cost, but used by everyone.
- **2nd Quadrant (Innovation Type):** Internal DX, etc. Low cost, demonstrating broad effectiveness.
- **4th Quadrant (Distortion Type):** "Hakomono" (White Elephant) administration and public awareness projects with low effectiveness. These are the primary targets for auditing using this method.

4.2 Limitations and Challenges

Since this method specializes in quantitative evaluation, it may not be suitable for the qualitative evaluation of measures related to **"Social Inclusion,"** such as cultural projects and livelihood protection. These need to be managed separately as "social costs."

4.3 Philosophical Foundation of SBCM: Strict Separation of Audit and Policy Judgment

SBCM is specialized as an **audit tool** to detect **objective anomalies (distortions)**, rather than a tool to judge the final legitimacy of a measure (e.g., acceptance of costs in depopulated areas).

1. Exclusion of Adjustment Coefficients:

Incorporating adjustment coefficients for geographical factors or aging rates into the formula **compromises the neutrality of the model and becomes a breeding ground for political compromise**. The purpose of SBCM is to purely visualize inefficiencies and cost increases caused by these factors as **"Distortion."**

2. Separation of Audit Results and Responsibility:

$D_{index} \gg 10$ indicates the **audit result** that **"the fiscal structure is an outlier deviating from the statistical tolerance range."** The **final judgment (adjustment or exemption)** of whether this outlier represents "true inefficiency" or "unavoidable social costs" is not the role of SBCM as a quantitative tool, but the **responsibility of politicians and administrators**.

4.4 Expansion of International Robustness: Principle of the Locus of Discretion

SBCM is a universal audit framework not limited to the Japanese administrative structure. To enable international application, the denominator of the "Standard Block" is defined based on the **"Principle of the Locus of Discretion."**

Principle of the Locus of Discretion:

The administrative unit (block) to which SBCM should be applied is the **smallest unit of governance that holds discretion and responsibility for service provision**, where the following three types of "autonomy" intersect:

1. **Budgetary Discretion**
2. **Legislative/Policy Discretion**
3. **Electoral Responsibility**

Verification:

States in Germany ($B_{std} \approx 5.3$ million) and the United States ($B_{std} \approx 6.73$ million) become massive blocks compared to Japan's basic municipalities ($B_{std} \approx 72,000$). This objectively reflects the **depth of delegation of authority (degree of decentralization)** in each country, thereby proving the universality of SBCM.

5. Conclusion

The Standard Block Comparison Method (SBCM) proposed in this study has made it possible to compare events of different scales by providing a common language of "**Standard Basic Municipality**" in the evaluation of administrative measures.

In particular, the introduction of the **Budget Distortion Index** (D_{index}) enables the immediate screening of "4th Quadrant" projects with low ROI without being misled by superficial numbers. The implementation of this framework is expected to accelerate **EBPM (Evidence-Based Policy Making)** and contribute to sustainable administrative and fiscal management.

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