

University Location, Student Choice, and Regional Demographics

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Extended Abstract

1. Introduction

Interregional migration of young people plays a central role in shaping regional demographic structures and long-term economic disparities. In Japan, university enrollment constitutes one of the most significant triggers of internal migration. Each year, a large number of high school graduates move across prefectural borders to enroll in higher education institutions, contributing to the persistent concentration of young populations in metropolitan regions and accelerating demographic decline in peripheral areas.

Although internal migration has been widely analyzed using gravity-type models, the role of higher education capacity—particularly university enrollment quotas—has received comparatively limited attention. Enrollment quotas are determined institutionally and influenced by national policy, yet they directly shape access to higher education opportunities across regions. Understanding how such institutional capacity interacts with student mobility is essential for evaluating the demographic implications of higher education policy.

This study proposes a unified framework to examine inter-prefectural migration associated with university enrollment. The analysis combines a conceptual model of student choice and university capacity with a modified gravity specification estimated using prefecture-level panel data. The objective is to clarify the mechanisms through which university enrollment capacity may influence youth mobility and, potentially, medium- to long-term regional demographic patterns.

2. Conceptual Framework

Rather than presenting a fully specified structural model, this study outlines a simple conceptual framework that guides the empirical analysis.

2.1 Student Choice

Students are assumed to choose enrollment destinations based on expected benefits and

costs. The expected benefits may include anticipated labor market returns, educational quality, and regional amenities. Costs may include tuition, living expenses, and migration-related costs such as distance from home.

Under a random utility perspective, the probability of choosing a given region depends positively on expected benefits and negatively on costs. Aggregating individual decisions yields migration flows that resemble a gravity structure: flows increase with origin population size and destination attractiveness and decrease with geographic distance.

2.2 Role of Enrollment Capacity

University enrollment quotas affect the availability of higher education opportunities in each region. Higher capacity may increase admission probability and perceived accessibility, thereby enhancing the relative attractiveness of a region. Conversely, limited quotas may intensify competition and restrict inflows.

Importantly, this framework does not impose strong assumptions about institutional objectives or equilibrium determination. Instead, enrollment capacity is treated as a policy-relevant factor that potentially shapes migration incentives. The purpose of the theoretical discussion is to provide intuition for including university-related variables in the gravity specification rather than to derive a fully structural equilibrium.

3. Empirical Specification

Guided by the conceptual framework, the study estimates a modified gravity model of inter-prefectural student migration:

$$M_{ij} = \exp(\beta_1 \ln GDP_i + \beta_2 \ln Capacity_j + \beta_3 \ln Distance_{ij} + \beta_4 X_j + \beta_5 Z_i + \mu_{ij} + \tau_t)$$

where:

- GDP: Gross prefectural product of each region
- Capacity: measures university enrollment quotas in the destination region,
- Distance: captures geographic migration costs,
- X_j : Control variables related to region j ,
- Z_i : Control variables related to region i ,
- μ_{ij} and τ_t denote fixed effects.

The primary parameter of interest is the elasticity of migration with respect to enrollment capacity. This coefficient provides an empirical indication of how strongly higher education infrastructure is associated with youth mobility patterns.

The model is estimated using the Poisson Pseudo-Maximum Likelihood (PPML) estimator, which accommodates zero migration flows and heteroskedasticity, common

features in bilateral migration data.

4. Data and Variables

The analysis utilizes prefecture-level panel data covering inter-prefectural student migration flows. Migration data are constructed from official statistics on university enrollment by prefecture of origin. University capacity measures include total enrollment quotas and the number of higher education institutions in each prefecture.

Control variables include regional income levels, labor market indicators, population density, and measures of urban amenities. These controls allow the analysis to distinguish the role of educational capacity from broader economic attractiveness.

5. Expected Contributions

This study contributes to the literature in three ways.

First, it highlights university enrollment capacity as a potentially important determinant of internal migration, extending standard gravity approaches that focus primarily on population size and distance.

Second, it provides a conceptual link between higher education policy and regional demographic dynamics, suggesting a channel through which enrollment regulations may influence spatial population distribution.

Third, by integrating educational infrastructure variables into a gravity framework, the analysis offers a systematic approach to evaluating the demographic implications of higher education reforms.

6. Conclusion

This study proposes a conceptual and empirical framework to analyze interregional migration associated with university enrollment in Japan. By incorporating university enrollment capacity into a modified gravity model, the research aims to clarify how higher education infrastructure may shape youth mobility patterns. The findings are expected to inform discussions on higher education policy and regional demographic sustainability.