

Title

Apparent Equalization? Population Redistribution and the Spatial Reorganization of Higher Education Opportunities in Japan, 1970–2020

Research Overview

Higher education institutions are unevenly distributed within countries, often concentrating in urban areas while rural and peripheral regions remain underserved. Using Japan as a long-term case, this study examined whether national higher education location policies reduced spatial inequality in access, or whether apparent equalization was driven primarily by population redistribution.

Purpose of Study

The spatial distribution of higher education institutions remains an ongoing policy issue amid population growth, decline, and urban concentration. In Europe, access to universities is nearly universal among urban residents but substantially lower in rural areas (Poelman & Dijkstra, 2018). In the United States, poorly served areas have been conceptualized as “education deserts” (Hillman, 2016). These studies indicate that higher education opportunity is not merely a matter of aggregate enrollment capacity, but also a problem of the spatially uneven distribution of institutions.

This study examined Japan as a long-term case of policies attempting to reshape this distribution indirectly. Postwar Japan addressed the concentration of higher education institutions in metropolitan areas through two main policy instruments: restrictions on new establishments and capacity expansions in metropolitan areas such as Tokyo, and regional enrollment-capacity targets across broad geographic blocks. Meanwhile, Japan

experienced demographic restructuring, including metropolitan concentration and population decline in peripheral areas. This combination makes Japan a strategic case for asking whether policies regulating institutional expansion and regional capacity can reduce spatial inequality, or whether population redistribution can produce an appearance of equalization even when institutional opportunities remain unevenly distributed.

Research Methods

The study constructed a longitudinal spatial database of universities and junior colleges in Japan for 1970, 1980, 1990, 2000, 2010, and 2020. Institutional data included location, sector, institution type, and enrollment capacity. High school student population data were drawn from census-based statistics for one-kilometer grid squares. Road-network distances between grid-square centroids and institutional locations were calculated using OpenStreetMap and the Open Source Routing Machine (OSRM).

The analysis proceeded in four steps. First, it calculated the distribution of high school students across distance bands to the nearest university or junior college. Second, it constructed a spatial opportunity index using the two-step floating catchment area method (Luo & Wang, 2003), with institutional capacity as supply and high school student population as demand. By using floating catchment areas rather than fixed administrative units, this method incorporated cross-boundary accessibility and avoided constraints imposed by prefectural or municipal borders. An 80-kilometer road-network threshold defined catchment areas. Third, it measured national-level inequality in the opportunity index using the Gini coefficient. Fourth, it decomposed Gini changes into contributions of institutional capacity redistribution and population redistribution. The

analysis also compared opportunity levels across cumulative population quintiles to test whether declining national inequality corresponded to improvement in less populated areas.

Results and Discussion

The analysis yielded four findings. First, simple proximity to universities and junior colleges improved. Among high school students, the proportion living within 20 kilometers of a university or junior college increased from 74.1 percent in 1970 to 90.7 percent in 2020. However, counterfactual analysis showed that improved proximity reflected not only institutional establishment and relocation, but also population concentration in already served areas.

Second, the opportunity index showed that the spatial distribution of higher education opportunities became more even at the national level. The Gini coefficient generally declined over the long term, especially from 1970 to 1990, although this decline temporarily stagnated or reversed between 1990 and 2000 before resuming after 2000. This suggests that, when accessibility across prefectural borders and local population distribution are considered, Japan's higher education opportunities appear to have become less unequal.

Third, the decomposition analysis showed that population redistribution contributed more to changes in the Gini coefficient than institutional capacity redistribution. After 2000, the decline in national inequality was supported mainly by population redistribution rather than by a more equal distribution of university and junior college capacity. Apparent equalization therefore did not mean that institutions became more

evenly distributed. Rather, people increasingly lived closer to areas where such institutions were already concentrated.

Fourth, cumulative population quintile analysis showed that national equalization and disadvantage in less populated areas can coexist. Although opportunity levels improved in all quintiles, the absolute gap between the least populated and most populated areas widened, especially after 2000. Thus, a declining national Gini coefficient does not necessarily indicate improvement for demographically peripheral areas.

This study contributes to research and policy debates on spatial inequality in higher education by integrating proximity and capacity into an index-based visualization. It concludes that institutional distribution should be examined alongside population redistribution when assessing apparent equalization under demographic change. These findings inform national and international debates on higher education policy, regional inequality, and demographic change.

Keywords

university location policy; spatial accessibility; population redistribution; regional inequality; two-step floating catchment area method