Efficient Size of Regional Population: an Interregional CGE Model Approach

Topic: Theory and application of CGE modelling
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This paper identifies if the population size of the Seoul Metropolitan Area (SMA) in Korea is efficient in terms of national economy, developing a recursive interregional Computable General Equilibrium (CGE) model with population module. In the general equilibrium framework, explicit benefit and cost by population increase are estimated as the industrial value added and inflation functions by region. The efficient size is computed as a range of population to positively contribute to economic growth of nation rather than only that of the SMA. Also, the optimal size is regarded as the population to maximize the GDP. Implicitly, it can maximize difference between the aggregate agglomeration benefits and costs.

The CGE model is developed for simply four industrial sectors of two regions, namely the SMA and the rest of Korea (ROK). The model specifies the behaviors of economic agents of six producers, two regional households, two regional governments and a national (central) government, and the rest of the world. The model is applied to various regional population alternatives of the SMA for fifteen periods. With total national population size fixed, the model can estimate the marginal increase of the relative share of the SMA or the marginal decrease of the relative share of the ROK population on the national and regional income growth. It reveals the range of efficient population size of the SMA and its optimal sizes by scenarios. The counter-factual analysis finds that de-concentration of population is desirable for the national economic growth of Korea. As the population share of the SAM to nation increases more than roughly 38%, the economic growth rate could start to decrease.