Growth of a Service Economy and the Global Warming

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In developed countries, the growth of a service economy largely contributes to the GDP, while it is expected that its growth contributes to reducing greenhouse gas emissions, which leads to mitigating climate change. The plausible explanation is that since the growth of a service economy simultaneously brings about the shrink of manufacturing sector which is more carbon-intensive than service sector, it consequently reduces the carbon dioxide emissions and other greenhouse gases. From the linked input-output table of Japan, we observed that the output share of service sector increased from 46% to 57% during the study period: 1990-2005, while the output share of manufacturing sector decreased from 49% to 39%. To what extent the growth of the service economy decreases the greenhouse gas emissions? In this paper, we addressed this important issue by performing the structural decomposition analysis. Our decomposition analysis quantified economic scale effects, industrial composition effects (output share effects), and technique effects (carbon intensity effects). From the empirical results of the Japanese economy during 1990-2005, we find that although the growth of the service economy has clearly contributed to reducing the carbon dioxide emissions, the climate mitigation effects has grown smaller since 1990.