Forecasting the Influences of Information and Communication Technology on the Structural Changes of Japanese Industrial Sectors: A Study Using Statistical Analysis

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Abstract : The purpose of this study is to forecast the influences of Information and Communication Technology (ICT) on the structural changes of Japanese economies based on Leontief Input-Output (IO) coefficients. This study establishes a statistical analysis to predict the future interrelationships among industries. We employ the Constrained Multivariate Regression (CMR) model to analyze the historical changes of input-output coefficients. Statistical significance of the model is then tested by Likelihood Ratio Test (LRT). In our model, ICT is represented by two explanatory variables, i.e. computers (including main parts and accessories) and telecommunications equipment. A previous study, which analyzed the influences of these variables on the structural changes of Japanese industrial sectors from 1985-2005, concluded that these variables had significant influences on the changes in the business circumstances of Japanese commerce, business services and office supplies, and personal services sectors. The projected future Japanese economic structure based on the above forecast generates the differentiated direct and indirect outcomes of ICT penetration.