< Abstract >

A Study on the Patterns of Changes in Industrial Structure and Long-run Aggregate Productivity Growth

This study consists of three parts: finding patterns, building a model to explain patterns, and application of the model.

First, we find common patterns in structural change and long-run aggregate productivity growth of major industrialized economies. Long term data of these countries dating back to the late 19th or mid 20th century shows that both long-run aggregate productivity growth and manufacturing employment share exhibit inversed U-shape patterns. It also shows that these two time series appear to be closely related. The correlation between them is relatively high, particularly during de-industrialization phase (average correlation coef. 0.87). And the peaks of two time series appear close in terms of timing with the peak of manufacturing employment share lagging that of aggregate productivity growth by about 10 years.

Second, we introduce a model to explain the patterns. In the model, an economy is composed of three sectors (agriculture, manufacturing, and services) and three assumptions are made : Engel's law (income elasticity of agriculture is less than one), unbalanced productivity (productivity growth is higher in manufacturing than in services), and agricultural economy as an initial condition. The pattern of structural change is derived from the model and three assumptions : industrialization (rising manufacturing employment share) from Engel's law and initial condition of agricultural economy, and de-industrialization (diminishing manufacturing employment share) from unbalanced productivity. The inversed U-shape pattern of aggregate productivity growth is generated in the model with an additional assumption of logistic functional form of sectoral productivity growth, which is supported by empirical data. Simulations of our model with parameters obtained from actual economies produce trends of structural change and aggregate productivity growth very similar to actual data. Compared with previous studies, not only does our model replicate actual trends better, but it also derives patterns from assumptions that have stronger empirical

bases.

Third, we discuss several issues related to structural change and economic growth, using logic or analytical tools obtained from our model. Applying our model, we decompose the growth slowdown of major economies, estimate the contribution of industrialization to economic growth, and forecast productivity growth and structural change of Korean economy and Chinese economy up to the year 2040. According to the prediction of our model, while productivity growth of Korean economy is expected to slowdown by less than 0.2%p by 2040, that of Chinese economy is forecasted to fall by more than 2%p as a result of the difference in development stage and the consequent difference in industrial structure. We also show that our model provide interesting implications and explanations for empirical findings of previous researches related to such issues as convergence, East Asian high growth, premature de-industrialization, and the relationship between agricultural revolution and industrialization. Finally, we discuss implications of our model for industrial policy and employment policy.