Reducing Carbon Emissions Via Structure Change Along A Consumption Turnpike: A Remesey-Tsukui-Leontief Dynamic Environment System Of China

Topic: 814X Structural Change and Dynamics
Author: Xue FU

Replacing applicable capital turnpike model (Tsukui and Mutakami, 1979) completely resolved by linear programming, an environmental oriented consumption turnpike is firstly presented, with maximum residentsâ€™ real welfare represented by accumulated long-term utilities (Remesey, 1928), however, it irresolvable before the development of a new dynamic programming model. Along this effective sustainable growth path, structure changes might enable China to meet its 2020 goal for carbon emissions reduction, where an environmental oriented dynamic input-output system of China is formatted in a dynamic programming and at given national carbon targets, with the aim of maximizing national utilities (or consumptions) over accumulation period, under constrains for both demand-supply dynamic balance and the magnitude of output and energy-use change within realizable and practical limits. The novels of Remesey-Tsukui-Leontief turnpike model are integrating the dynamic input-output model with a new dynamic programming with both constraints under given terminal condition and national carbon targets, and an objective maximizing the accumulated final demand (excluding investment) over the planning time, rather than that maximizing the terminal capital in Tsukuiâ€™ capital turnpike. By a new reverse algorithm, a solution to an effective sustainable growth path finds inter-industry shifts of production and investment enable China, with reasonable ratio of consumption to investment accumulation on the long term, to reduce carbon emissions per GDP by at least 40% of its 2005 levels before the year 2020. The model suggest that increasing service share by 5% without panel manufacture growth, increasing consumption annually by ten point percentage than actual economy performance would help Chinaâ€™s economy growth more effectively.