

The Effects of Technology and Division of Labor on Value Added Rates: an Analysis Based on Input-Output Model

Topic: (3.7) Techniques for Identifying Important I-O Coefficients and Sectors

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Abstract: The value added rates of variant industries in many countries keep decreasing in recent years. This paper investigates this issue, and discusses how technology progress and the development of division of labor affect the value added rates. First, a framework for analyzing value added rates based on input-output price model is built, and used to investigate the relations between the two factors and value added rates theoretically. Then by using world input-output tables in current and previous year prices, the effects of technology and division of labor are analyzed empirically. The main results are as follows. Firstly, technology progress alone will lead to the increase in value added rates. Secondly, for division of labor, the results are complicated. The division of labor without technology progress and efficiency improvement will certainly cause decreased in value added rates. However, division of labor accompanying technology advance and efficiency increases has different effects: for the industry where division of labor originates, its value added rate does not necessarily decrease, and may increase in some occasions; for other industries, their value added rates will increase. The empirical results show that from 1996 to 2007, international specializations with efficiency improvements lead to increases in some countries' manufacture value added rates, such as US Japan, India and European Union. But for China, the manufacture value added rate actually decrease under international specialization. The main factor causing the decreases of value added rates in US and Japan is price changes, and the main factors for the decreases of value added rates in EU and Canada are non price factors except for international division of labor and price changes.

Key words: value added rate; division of labor; technology; input-output price model