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Is the Productivity Growth of Services Higher Than Industries in China?

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1. Research Problem

The Chinese economy has achieved remarkable growth since 1978 when the reform and opening-up policy was implemented. The tertiary industry has also grown rapidly during this process. According to the latest official statistics, the nominal value added of the tertiary industry as a percentage of gross domestic product (GDP) has increased from 24.6% in 1978 to 51.6% in 2016. In particular, it has exceeded that of the industry and made the tertiary industry become the industry with the largest proportion of GDP since 2011. Given its vital position in the national economy, the long-term, sustainable development of the tertiary industry has a profound impact on the long-term development of the Chinese economy. Especially in recent years, the development of the Chinese economy has entered a new normal state. With the gradual deterioration of the international economic environment, the little effect from the policy of expanding domestic demand, and the urgent demand for industrial upgrading, all of which make the long-term, sustainable development of the tertiary industry even more important.

The question on the sustainability of the tertiary industry cannot be answered without the exploration of the growth of total factor productivity (TFP), which is the decisive factor affecting the long-term sustainable growth of the industry and even the national economy. Many studies investigate the TFP growth of the Chinese service sectors (e.g., Guo 1996; Cheng, 2003; Wang and Hu, 2012; Wang et al., 2015). Some studies find that the TFP growth in service sectors is higher than that in industrial sectors (e.g., Pang and Deng, 2014; Liu and Zhang, 2010).

However, there are still some shortcomings in the existing studies. First, they adopt aggregate production function in gross accounting, which not only needs some restrictive assumptions for the existence of the aggregate production function, but also ignores the important role of intermediate inputs. Many studies have paid attention on the important role of intermediate inputs playing in economic growth (Hulten, 1978; Jorgenson et al., 2005). Second, they use the official value added price index to derive real value added, which is often criticized as underestimation of price change and overestimation of output growth. Third, they cannot trace the aggregate economic growth and TFP growth to industry level and also cannot measure the growth contribution from individual industries. Finally, they ignore the resource allocation

effects which is considered as an important factor affecting TFP growth (Hsieh and Klenow, 2009; Zheng, 1994).

The objective of this study attempts to tie theory, methodology and measurement firmly together to form a unified analytical framework, and also considers the resource reallocation effects across industries to measure the TFP growth in services and industries in China.

2. Methodology

The aggregate production possibility frontier (APPF) approach (Jorgenson et al., 1987) and KLEMS data have been widely used to measure TFP growth (OECD, 2001; O¡¯Mahony and Timmer, 2009) since the APPF approach is based on a gross output production function, which also takes the important role of intermediate input into account (Hulten, 1978). Moreover, the Domar aggregation scheme (Domar, 1961) and resource reallocation effects are also incorporated into the APPF framework. Domar weights, defined as the ratio of gross output of a sector to aggregate value added, can capture the impacts resulted from the productivity improvement of a sector on the aggregate economy. The resource reallocation effects, defined as difference between the Domar-weighted sum of growth rates of factor inputs across sectors and the unweighted growth rate of aggregate factor inputs, can reflect the contribution of resource utilization efficiency across sectors to aggregate TFP growth.

3. Data

The data used in this study are from the China Industry Productivity (CIP) Database Project. This project follows the KLEMS principles of data construction and aims to construct consistent sector-level input and output data series that satisfy analytical studies in a production function framework as well as for international comparisons of output and productivity. By the same token, the gross output of an industry equals the total costs of KLEMS, and the gross output of an economy equals the sum of the costs of KLEMS of all industries.

4. Organization

This paper will be organized in four sections as follows. Section 1 discusses the current situation of analysis on the TFP growth in services and industries. Section 2 introduces the APPF framework and CIP database. Section 3 provides and discusses the empirical results. We finally conclude this study in Section 4.