

論文の内容の要旨

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論文題目 Agriculture and Economic Growth in China: Labor Transfers, Capital Accumulation, and Food Supply Reconsidered

(中国における農業と経済成長: 労働移動、資本蓄積および食料供給の再検討)

China's remarkable economic growth is accompanied with its profound structural transformation. Much attention to China-style growth is paid by development economics. Agriculture has been playing a very important role during this process. Although there are a great number of studies investigating the development of China's agriculture, there are few studies that deeply analyze China's growth from the perspective of agriculture's contribution. This dissertation attempts to examine the contribution of the agricultural sector to economic growth and structural transformation in China under the enlightenment of the previous theories and studies.

The analytical framework of this study is the dual economy theory that divides the entire economy into the agricultural (or traditional) sector and the non-agricultural (or modern) sector based on the different production paradigms. The first analysis is to scrutinize the reallocation of the labor force between the two sectors of China in Chapter Two. We build a benchmark model as a discrete choice to describe how likely peasants would migrate from the agricultural sector to the non-agricultural sector.

In our model inter-sectoral labor transfers depend on the wage differential between the two sectors, the probability of finding a job in the non-agricultural sector, the transfer cost, and the preference parameters. Besides, two other factors such as political regulation and food constraint should be considered as determinants of labor transfers. According to the benchmark model our holistic examination of Chinese labor statistics from 1952 to 2012 resulted in the conclusion that inter-sectoral labor transfer rate should be recalculated. The proposed date performs quite well in explaining the inter-sectoral labor allocation between the agricultural and the non-agricultural sectors. We estimated an expected probability of finding a job in the non-agricultural sector for a peasant using the new date. The value is obviously much lower than Todaro's theory predicts.

Chapter Three attempts to elaborate the mechanism of capital accumulation in the agricultural sector and the non-agricultural sector in China. Unlike labor transfer, inter-sectoral capital mobility did not attract so much attention and has not been elaborated explicitly no matter theoretically or empirically.

Through a dual economy model that describes the capital accumulation in each sector, three important propositions are examined theoretically in this chapter.

Proposition one: Generally, in a closed economy, with others held, the relative increase

of the agricultural products (food) price will encourage the capital accumulation in the agricultural sector and suppress the capital accumulation in the non-agricultural sector. In contrast, the relative increase of the non-agricultural products (like machine) price will be in favor of the capital accumulation in the non-agricultural sector but against the capital accumulation in the agricultural sector.

Proposition two: Assuming a closed economy without any capital flows between the agricultural sector and the non-agricultural sector, there would be a long-run stationary rate of capital accumulation in each sector under an exogenous inter-sectoral labor transfer rate. And the more inter-sectoral labor transfer rate would result in the less stationary rate of capital accumulation in the agricultural sector but has no effect on the stationary rate of capital accumulation in the non-agricultural sector.

Proposition three: When food supply is mostly met by domestic production, we consider two kinds of lower boundaries for the capital accumulation rate in the agricultural sector. Low boundary 1 denotes the capital accumulation rate to keep the average agricultural wage rate at the subsistence level. Low boundary 2 refers to the rate that ensure sufficient food supply for total population. The higher labor transfer rate leads to the lower level of boundary 1 and the higher level of boundary 2. Dominative boundary has been changing through economic transition. The boundary 1 dominates at the early stage while the boundary 2 becomes dominative as economy develops.

The three propositions are tested using the data of sectoral capital stock in China from 1952 to 2012, which is originally calculated in this chapter. The main findings are as follows. First, during the period of the relatively closed economy from 1962 to 2000, the two relations are observed; a weak and positive relationship between the food price and the agricultural capital accumulation rate and a weak and negative relationship between the food price and the non-agricultural capital accumulation rate.

Second, before the economic reform, the capital accumulation in each sector seemed to keep the stationary rate under self-financing condition. However, this self-financing status was broken by the economic reform. During the period from 1978 to about 2000, the predicted stationary rate of capital accumulation was higher than the observed rate in the agricultural sector while the situation was the opposite in the non-agricultural sector. It implies there has been a great amount of capital that flowed out of the agricultural sector into the non-agricultural sector since the economic reforms. The predicted stationary rate of capital accumulation is lower than the observed rate in both sectors since 2000. It is due to the inflows of foreign investments and the increasing government investments in the agricultural sector.

It is worth noting that according to our conclusion, the labor transfer rate only has much more impact on the stationary rate of capital accumulation in the agricultural sector rather than the non-agricultural sector in the long run when the economy is closed without inter-sectoral capital flows. In this case, however, the decrease in capital accumulation rate of the agricultural sector due to the inter-sectoral labor transfers can be regarded as a disguised capital flows between the two sectors and its influence on the agricultural sector is quite significant.

Last, at the early stage of economic development, especially before the economic reforms, the lower boundary 1 was the dominant constraint. Beyond the cross point in 1982, lower

boundary 2 became dominant. Furthermore, the observed rate of capital accumulation in the agricultural sector moved closer together the lower boundary, at first near lower boundary 1 and later near lower boundary 2. Besides, it is worth noting that lower boundary 2 exceeded the observed rate of capital accumulation in the agricultural sector due to the rapid inter-sectoral labor transfers since the 2000s. As more and more labor forces were transferred into non-agricultural sector, the agricultural sector might need more own capital accumulation to meet domestic agricultural production to the growing demand for food. Thus, in the same time, the food price rose suddenly.

The analysis of Chapter Four is based on the data and findings in Chapter Two and Chapter Three. In this part, the analytical focus lies on the integrated configuration of factors inputs of production and the role of technological dynamism. At first, according to the capital-output ratio in China, we can find three phases of transition between 1952 and 2012: the period from 1952 to 1962, the period from 1963 to 1995, and the period since then. Capital-output ratio during the first and the third phases increased while it was almost constant during the second phase. This segmented feature is also shown in the agricultural and non-agricultural sectors, respectively. Then, we estimate the Cobb-Douglas production function in each sector. At last, adopting the estimated technological parameters, we conducted the growth accounting analysis in both sectors from 1953 to 2012.

The findings from the growth accounting in both sectors can be concluded as follows. Firstly, both the growth of the agricultural sector and that of the non-agricultural sector periodically changed no matter before or after the economic reforms. Secondly, both of agricultural sector and non-agricultural sector developed much more after the economic reforms. Thirdly, the technological progress (caught by Total Factor Productivity) accounts for the largest contribution to the growth of the agricultural output. In contrast, the most significant contributor in the non-agricultural sector is capital accumulation for most periods. Finally, the labor increase hardly contributed to the agricultural sector as much as the other studies showed.

Most studies mentioned economic reforms toward opening-up as contribution factors to China's rapid growth. Besides, we should notice one more important fact that the domestic economic reforms enabled China's agricultural sector to release abundant factors of production to the non-agricultural sector. Then, as discussed in Chapter Two and Chapter Three, thanks to the factors of production contributed from the agricultural sector the non-agricultural sector could develop rapidly. It would be interpreted as the primary cause of China's rapidly growing. And so on, we can infer that once the advantage of inter-sectoral factors flows was exhausted, China's growth, mainly in the non-agricultural sector, would probably lose its momentum before, especially when the benefits from economic reforms became insignificant any more. Thus, the technological progress functioned as a next source to keep a high growth rate in China

Another significant contribution of China's agricultural sector is to supply sufficient food for her huge population. One major feature of our dual-sector model is to include the role of national food supply, no matter any economic transition. That is to say, the sufficient and stable food supply is always required as the security for China's rapid growth. However, along with more and more resources and production factors transferred to the non-agricultural sector, food security will still be a serious political address for China's

further development. In particular, China has loosen the population restriction policy and abolished One-Child Policy recently. There is a concern that the natural population growth rate may recover. Thus, to develop the agriculture and ensure the sufficient food supply will be an arduous task next.