Book review

Historical and Cultural Interpretation of Agricultural Growth and Food Security

Giovanni Federico
Princeton University Press
Keyword Productivity growth
Review DOI 10.1108/CAER-03-2016-0038

From the slash-and-burn farming, hunt to male plow female weave, big machine production, the development of the agriculture civilization described the history of human nature, conquered nature and lighted up with flashes of human sweat, and wisdom. Agricultural production is closely related to most basic requirements of the lives of human being since the agricultural products are necessities for daily lives. The Chinese civilization is original from the Yellow River and the traditional society lasting for nearly 1,000 years form "the exceeding stable structure in the agricultural production and lead to the long-term poverty of small farmers, and at the same time, people in the Atlantic economic circle on the other side of the world do the activities, like planting or raising livestock, according to the seasonal change, soil characteristics (Guantao and Qingfeng, 1984, pp. 193-196)." Those activities are also influenced by the threat of disasters, such as animal and plant epidemics, famine in Ireland. Obviously, factor endowments and environmental characteristic play an important role in the traditional agricultural production, which are the main factors that restrict the agricultural production. Based on this, Professor Giovanni Federico states a success story of the agricultural economy – *Feeding the World: An Economic History of Agriculture, 1800-2000 (2004, pp. 8-11).* The author follows the economic paradigm, expresses how the agriculture feeds the world, enriches the various types of products, and provides the labor force for other economic sectors in the past two centuries. Currently, the book that is translated by Professor Xiurong. He has published in the China Agricultural University Press at 2011.

It is a comprehensive model about the history of agricultural economy. Moreover, Professor Xiurong He from China Agricultural University brought it to China. By chance, he met the original work. With the mode of serious thinking, learning attitude, learning method, he developed China agricultural economic historical research, and began his arduous road of translation. Professor He successfully promotes such valuable academic books in China because of combination of economic history, political science, sociology, academic insight, the ability of logic analysis, and the ability of multinational language in the book. In November, 2011, with the support of many publishers such as China Agricultural University Press, the translation version, named *Feeding the World: An Economic History of Agriculture, 1800-2000*, has been successfully published. He successfully present a complete new agricultural economic history textbooks to the Chinese scholars. The thinking of economics not only describes the development of agricultural economic history filled the gap of agricultural economic history and provides a new way and a new train of thought for China's agricultural economic history research, but also is the leading book in the agricultural civilization study.

China Agricultural Economic Review
Vol. 8 No. 3, 2016
pp. 526-530

1756-137X

1. Agricultural productivity and technology progress

In general, historians and economists often use a single factor measurement method to measure agricultural productivity, such as yield per unit area (per-acre yield), the output of unit labor, etc. However, from the perspective of actual available historical data and per-acre yields of each historical period, population have no clear records. It is also a controversial academics. Especially in China, the traditional society lacks systemic economic statistics. The quantifiable economic variables are limited, since economic history scholars still try to explore the small-scale peasant economy in the traditional society. However, the author explores long neglected agricultural productivity and measure ways changing from a single factor to multiple factors – the total factor productivity (TFP).

First of all, the author classifies types, and compares the related historical data of some countries in the world (across six continents) in 1800-2000, such as agricultural production, agricultural products prices, varieties, elements prices, wages as detailed as possible, and presents the agricultural development situation from the two aspects of the longitudinal and transverse. In the longitudinal view, it is easy to know the long-term changed trend when the agricultural development of the each countries melted into the long river of history development. In transverse view, the agricultural development of every country and region integrates into the agricultural development of the whole world. The similarities and differences are easy to notice. The truth behind the seemingly accidental historical events are no longer mysterious, which it help to explore the general rule of development. Owing to absence of historical materials, the historical data of some countries and regions exist faults on time, but the author uses the partial comparison and analysis, combines time series data, and crosses section data to make the conclusion of agricultural economy development regularity.

Second, in order to be aligned with the standards of agricultural productivity from different countries, the author tries to adopt the residual method of TFP growth rate, and put forward by Nobel laureate Robert Solow to measure the change of TFP. This is useful to estimate the rate of change of TFP and the coefficient of variation of some countries and regions in 1800-2000, and then draws the conclusion. The agricultural productivity has been growth in most countries and most periods. The performance of many countries in Organization for Economic Co-operation and Development is quite good. The performance of developing countries is uneven. From this perspective, agriculture has changed from a backward department to a leader.

Most importantly, the TFP growth actually represents a more efficient technology progress, and makes the production possibilities expand outward. Followed the path of the "Smith growth," the change of the factor causes the change of the factor price, which affects the change of the technology selection, the efficiency of resource configuration, and economic growth path selection. In this process, the TFP growth is largely derived from technology selection and agricultural productivity growth based on agricultural technical progress, which reflects in biological innovation, farming methods, chemical products, machinery manufacturing, etc. In terms of the causes of technological progress, the author also explores it from several aspects. Factors of price changes caused by technological progress is the most basic aspects, such as Europe and Japan selecting land and saving technical progress. Western immigrant country (USA) mainly chooses labor-saving technology progress, and the attraction of the labor-saving innovation mainly depends on the increase of velocity, in terms of wages, rent, and interest rate. Furthermore, for research and development and promotion of public investment have also played an important role in promoting technological progress.

2. "The economic history" and "Economics method research of history"

In order to differentiate with the ordinary economic history book, the book *Feeding the World: An Economic History of Agriculture, 1800-2000*, written by Professor Giovanni Federico, is not a traditional historicism paradigm, but it can be deemed as research paradigm of economics. Traditional historicism as an "economic history" uses the descriptive language to research economic problems in the history, and "Economics method research of history" is on the basis of economics research paradigm, using the methods of measurement and statistics to solve the economic problems in the history, such as putting forward the systemic inference and hypothesis, and verifying its rationality, and continuously exploring its inner link.

At the start of the book, the author has put forward the credibility of the data of "history." On one hand, countries that publish foreign trade statistics and other relevant data are not in the same period. On the other hand, the data which is affected by factors statistical caliber. Therefore, it is very difficult to obtain the history of the big agriculture industry related statistics. However, the author's research is not limited to this problem and he combines the time series data and cross-section data through using economics method applied into research history. First, the author puts forward a hypothesis:

H1. The output of agricultural production presents the long-term growth trend through the long-term trend of agricultural production.

The long-term trend is based on the national account system in macroeconomic, based on the annual data including output, price, structure of agricultural production, and trade from four aspects. The main statistical indicators are output rate, agricultural prices change rate, farming and animal husbandry production, rate of change of world trade in agricultural products, etc. In the sorting data, research is based on the basis of integration with extension, and the study of the defects are predicted and explained.

In order to verify the hypothesis, analyzing the change of various factors of production in agriculture needs to calculate the TFP from 1800 to 2000 countries and regional. It is well known that the basic production factors including land, labor, and capital. The agricultural land will be classified as a production factor when it becomes the cultivated land and plantation of arable land or pasture, and capital factors including soil improvement, agricultural structure, agricultural machinery, livestock and capital flows, labor factors affect output, including the change of the number, gender structure, the structural changes in the age and skills, etc. According to different regions and time, the author integrates the statistics associated with the factors of production, analyzes the growth of land and labor productivity impact on productivity, and finally concludes the agricultural production in the long-term growth trend by estimating the change of TFP.

In recent years, the introduction of the econometric methods for economic history research has been widely recognized, which has become one of the most important aspects of the "The history of economics method research," scholars call it "new quantitative" (Climetrics). "New quantitative" opens up a new direction for economic history research and the history of the quantitative research. Getting consistent high praise from domestic and international scholars. Professor Lillian M. Li and Robert B. Marks uses quantitative research methods to explore relationships between natural disasters and the food price volatility in the Qing dynasty of China. Professor Color and Kaixiang Peng takes advantage of quantification method of food prices research market integrating problem in China in the Qing dynasty. Professor

Clark and Hao Yu solve the quantitative surname and social mobility problems. In comparison of the early research mentioned above, the authors do not use sophisticated econometric model to estimate the relationship of each variable, which followed the basic path of the economics research from the factor analysis to the production output analysis, the choice of technology and the changes of the system, a comprehensive explanation of the true level of agricultural production and development in the long period of time. The content simple is to economic history scholars in the research work and study.

3. Conclusion

In terms of the basis of originality, research contents, and research methods, Professor He has a strict and rigorous academic attitude, and tells the readers regarding the development of agricultural economy in the last 200 years, analyzes deeply the various factors affecting agricultural performance, including environmental factors, technology development, agricultural institutions, marketing, government, etc. He also tells the readers to understand how to combine both qualitative and quantitative analysis together, and gives them a kind of the enjoyment of reading. However, the success story of agricultural economics in the book only considers the growth of the total food supply. From the total amount perspective, the agriculture successfully feeds the people across the world in the past 200 years. According to the perspective of food demand, there are still some countries and regions around the world in poverty, and some women and children are in the threat of hunger and malnutrition. The food security is still a challenge in the current social environment. As the authors initially described in this book, "from 1800 to 2000, the world's population grows from Less than 1 billion people to 6 billion people, has increased by 6~7 times," in this long period of time, the agricultural output shows long-term growth, and per capita food also increase. From the view of general equilibrium, supply exceeds demand, food prices should decline. However, observing food prices around the long time data is available from 1870 to 1938. The change rate of some countries food prices is negative although it is limited for the number of countries that can obtain the price index change rates in the same periods.

Since the twentieth century, the national economic statistics gradually improves, which is easy to get the world grain market prices. Especially from 2000 to 2013, the food price index rose from 90.4 to 210.9, it is certain that the grain market price level rose by more than 1.33 times and the peak of rising food prices appeared in 2008 and 2011.

Therefore, world food prices basically shows a rising trend that is not the result of general equilibrium since 1800. In fact, it is easy to see that the author analyzes long-term upward trend that explores in the book on the supply side and food as substances essential for human survival that has the characteristics of the rigid demand and rising food prices shows that there are some areas that food needs cannot be met like what is Amartya Sen said that is deterioration of rights that is changed and agricultural economic scholars call it food security issues.

"Food security" means people can get enough food needed to survive at any time, which food security is mainly involved in food supply. However, the author lays out the problem ignored for a long time that the agricultural productivity presents the long-term growth trend and keeps food per head of population that is six times the population since 1800 growth in this book. In contradiction with the food security problem that gradually formed since 1970. According to world development indicators that the World Bank reported, we know although the incidence of child malnutrition showed a trend of decline,

it is also up to 14.3 percent since 1990. In some countries and regions. According to the United Nations Food and Agriculture Organization estimates that 70 percent of the population still relies mainly on public distribution system for food at now in the North Korea and a United Nations survey found that more than a quarter in the North Korean children under the age of five are moderate or severe malnutrition in 2012.

So the current food safety problems is still serious in the world. As the challenges faced by North Korea that the agricultural reform and natural hazard exist at the same time and the uncertainty of food security is also a dynamic problem, it is also a kind of dynamic equilibrium process. In a long period of time, this period of food production is determined by the grain price of the previous period that is the supply function of grain price of the previous period and current food production is determined by the grain price of the previous period that is the demand function of the current food production and the next food production is determined by the current food prices which is supply function of the current food prices. This means that once the low price of the previous period, food exporter will not increase grain output and exports because price factor is the incentive direct factors of grain production. Countries which cannot grow and produce food are faced with the problem of food security and agricultural trade liberalization become good solution that solves the problem of grain supply and demand.

Different countries have different factor endowments, different production requirements and the different density of the factors of production input, so there is a certain comparative advantage on the production of products under the corresponding characteristics of factor endowments. With the global economic integration, productivity configuration is toward integration and so countries should make full use its superior resources and avoid weaknesses. For countries with land resources advantages, they clearly need exporting food through the international trade also acquire the international division of labor of welfare benefits. The benefits of agricultural trade liberalization is not only trade benefits but also improving the efficiency of resource allocation by expanding the market mechanism, so Professor Giovanni Federico tell us that in the history of agricultural economy our predecessors never stop work hard and they make the long-term growth of agricultural output to feed the people of the world in *Feeding the World: An Economic History of Agriculture, 1800-2000*. In this 200 predecessors continuously explore and optimize the agricultural policy and the way of agricultural production, and getting the truth from practice and that is ignored for a long time in the world.

Today, the history and reality are constantly warning people that in an age of rapid development of science and technology, the main problem of the threat to human survival is not agricultural production output too little, and indicate how to more effectively allocate to make more people out of poverty, which enable more people to put heart into the problem that how to maintain the world within the scope of food supply and the demand of long-term stability in the future.

Fayi Jia
School of History and Culture, Shanxi University, Taiyuan, China

Reference

Guantao, J. and Qingfeng, L. (1984), *Prosperity and Crisis of China's Feudal Society to Exceed Stable Structure*, Hunan People's Publishing House, pp. 193-196.