

Analysis on the Relationship Between Grain Production and Economic Growth in Jilin Province

Shuai Liu^{1, a}, Shuai Tian¹

¹College of Economic and Management, Jilin Agricultural University, Changchun, Jilin Province, China

^a37829053@qq.com

Keywords: Jilin Province; Grain Production; Economic Growth.

Abstract. Jilin province has one of the "golden corn belts" in the world, and it is one of the old industrial bases in northeast china. This article analyzes the grain production statuses and economic development situations in Jilin, and finds that the level of grain production in Jilin lists the top position in our country, but its economic level is at weak position. In order to solve this problem, this paper suggests that, Jilin province can use its advantage of grain production to promote the development of economy.

Analysis on Grain Production in Jilin Province.

In 2015, the sown area of grain in Jilin was 5.078 million hectares, accounting for 4.5% of the whole country. Grain output reached 36.47 million tons, accounting for 5.6% of the country's total volume. Compared to the total grain output, Jilin enjoys more advantages in grain yield per unit area. In 2015, the grain yield per unit area in Jilin reached 7182.1 kilograms per hectare. It was higher than the national grain yield by 1699.2 kilograms per hectare, and remained the highest in the country.

Like the development of economy, the change of grain production has a cyclical character [1]. This paper calculates the fluctuation cycles of grain production in Jilin province first. Namely, to select a formula to calculate the fluctuation cycles of grain production in Jilin province. By using eviews, the equation $y^{\wedge}=979.4+158t-8.33t^2+0.19t^3$ is used to carry out the regression analysis on total grain output. Then, two fluctuation cycles are regarded as a stage of development to analyze the reason of food production fluctuation (shown in Figure 1). In 1982, Jilin province began to implement the household contract responsibility system, so the figure of that year is chosen as the starting point.

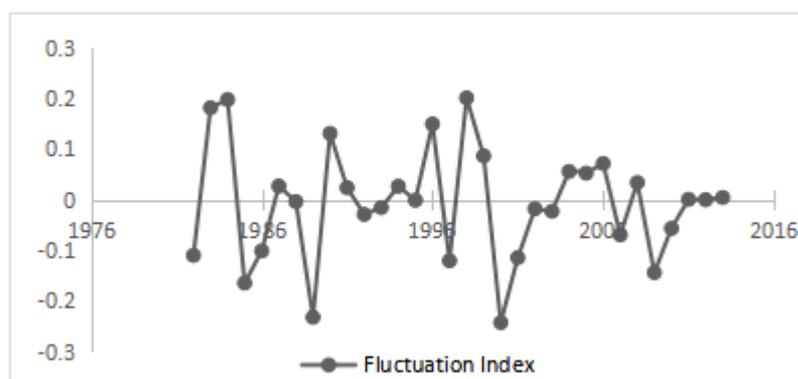


Figure 1. Fluctuation Indexes on Grain Production in Jilin Province, 1982 - 2015

The fast growing period (1982-1989). As shown in Figure 2, the total grain output in 1984 increased by 63.45% versus 1982. The main reason for this rapid increase was the household contract responsibility system which inspired farmers' incentive to produce. In 1985, however, the agricultural products price reform forced the grain price down, and hurt the benefits of farmers. That led to the sown area decrease by 6.23%. In the same year, severe natural disasters occurred in Jilin and affected 79.91% of sown lands, of which 545000 hectares suffered total crop failures. These two factors resulted in dramatically decrease of food production. In 1986, the government of Jilin province

adjusted planting structure, vigorously constructed commodity grain bases, and put forward to policies that grain and fertilizer linked together and to purchase grain with raised price award. Grain production began to rise slowly. In 1989, due to the impact of natural disasters, grain production in Jilin declined out of control, the disaster rate reached 82.7%.

The period of stagnation and fluctuation (1990-2000). After 1990, grain production volume in Jilin province hovered around 19 million tons. In 1996, a new production peak appeared. In 1995, a responsibility system that provincial governors held directly responsible for ensuring grain production was implemented. Then in 1996, the sown area increased more than 50 thousand hectares. That system was the major cause of this grain production increase. In 1998, Jilin suffered a severe drought disaster. The grain output, however, increased significantly. During 1997 to 2000, Jilin faced the struggle of drought. In 2000 the affected area reached 353800 hectares, accounting for 9.91% of total sown area. The food production faced very serious challenges, and the food production dropped to 16.38 million tons, the lowest level since 1989.

The period of consolidation and development (2001-2001). The drought in 2000 affected Jilin continuously. The grain production in 2003 did not restore to conventional level. At the same time, a nationwide food production depress occurred. Government issued the "number one document" to encourage the grain production. In 2004, Jilin cancelled the agricultural tax as a pilot. In 2006, Jilin implemented the direct grain-growing subsidy. These policies, along with the progress of science and technology, greatly inspired farmers' enthusiasm. During that period, the grain production in Jilin continued to grow with a steady pace. Except for 2007 and 2009, in which Jilin was affected by droughts and grain production fell down a little. By 2015, grain output in Jilin reached 36.47 million tons.

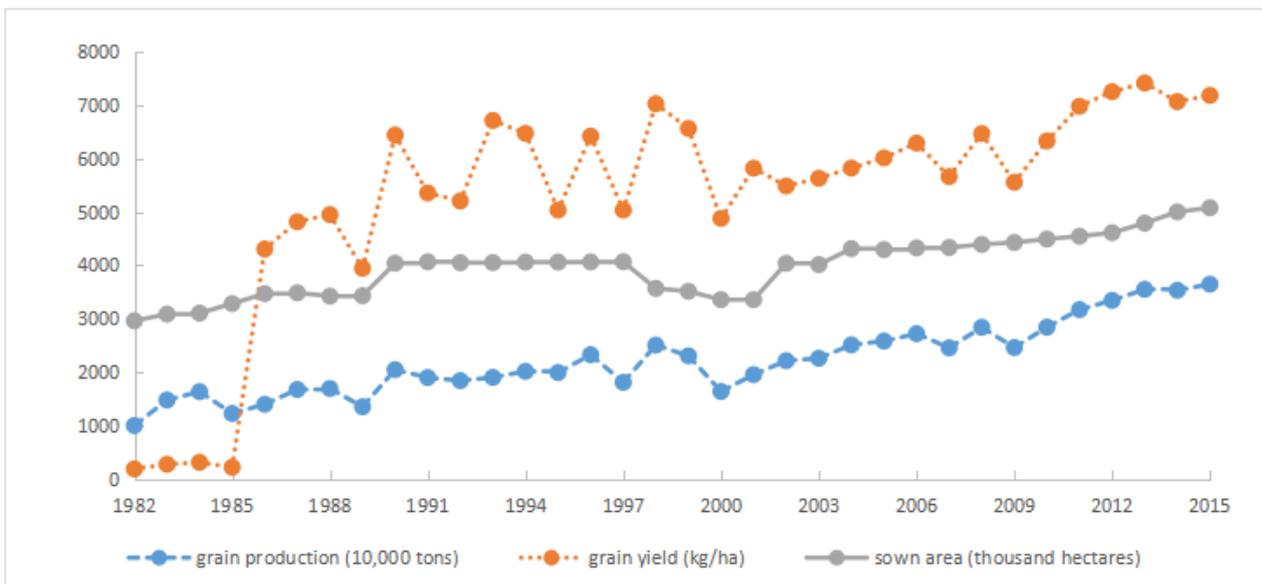


Figure 2. Grain Production in Jilin Province for the Last 30 Years

Data sources: Jilin Statistics Yearbooks 1983-2015

Analysis on Economic Growth in Jilin Province

In order to better reflect the economic development of Jilin province, the following indicators are chosen to analyze its economic situation. Several features on economic development in Jilin province are concluded and listed as below.

The level of GDP. The overall level of GDP was backward. To get the actual growth rate of production level, the GDP levels after stripping out price factors are used. That GDP increased from 12.167 billion yuan in 1982 to 256.5 billion yuan in 2015, the average annual growth was 26.67%. In 2015, the total amount of Jilin's real GDP was 11.1812 trillion yuan, accounted for 4.74% of the whole country. In 2015, the provincial GDP of Jilin ranked 22 in the country. GDP per capita was

\$8168, ranked 11 in the country. Compared to the level of grain production, the economic development of Jilin province was not dominant in the country.

Regional development unbalanced. The economic development in Jilin has an obvious feature of regional disparity. The development differences between regions are great. The GDP for three regions of east, middle of west are respectively 327, 1013.9 and 549.6 billion yuan. The economic development level of central area is far ahead of the other two areas. Within these three regions, GDP distributions are unbalanced, too. Take Changchun area and Liaoyuan area in the central region as an example, the total volume of Liaoyuan's GDP only accounts for 14.9% of Changchun area.

The industrial structure. In 2015, the structure ratios of primary, secondary and tertiary industry were 11.2, 51.4 and 37.4 respectively. Their contribution rates to economic growth were 6.9%, 47.4% and 45.7%. In 2015, the proportion of primary industry in Jilin province accounted for 11.2%, which was 3.6% higher than the national average level. But the contribution rate of primary industry to economic growth was only 6.9%. Agriculture in Jilin was big but not strong. As one of the old industrial bases in northeast China, the economic development of Jilin province was stimulated by the secondary industry. Secondary industry here was growing faster than the national average level, but it still focused on heavy industry, especially on automobile industry and petrochemical industry. The secondary industry did not promote the development of agriculture. The third industry in Jilin province accounted for 37.4% in 2015, but its main service objects were residents, not production industries.

Per capita disposable income of urban and rural residents. Per capita disposable income of urban and rural residents in Jilin province improved greatly. But the income of urban residents grew faster than rural residents, so the income gap generally expanded. From 1982 to 2015, per capita disposable income for urban residents increased 57 times. From 431.16 yuan in 1982 to 24901 yuan in 2015, the average annual increase was 741.78 yuan. Over the same period, the income for rural residents increased 34 times. From 333 yuan to 333 yuan, the average annual increase was 333.12 yuan. In 1982-1992, the income gap between urban and rural residents was very small, the minimum rate reached 1:1. During 1992-1996, township enterprises in Jilin province developed rapidly. With the support of the country's spark plan, non-agricultural employment opportunities for farmers increased, and farmers' non-agricultural incomes rose. The income gap narrowed down. During 1997-2009, the gap gradually expanded from 1.8:1 to 2.8:1. At that time, China was busy entering WTO, and implemented the reform of grain circulation system. The sown area of grain was cut, led to the reduce of grain production and farmers' income. Although from 2004, government's inputs on "three agriculture" increased, the long periodicity of agricultural production made the widening gap between urban and rural income irreversible in short term. A slight narrowing occurred during 2010 to 2015, the gap reduced from 2.5:1 to 2.2:1. Generally speaking, the urban-rural disparity in Jilin has decreased slightly. But to achieve the balanced development between urban and rural areas, there's still a long way to go .

Existing Problems of Grain Production and Economic Growth in Jilin Province

The unreasonable industrial structure. Jilin province is a big agricultural province, not it is not a strong agricultural province. Primary industry's contribution to secondary and tertiary industry is small, while secondary and tertiary industry do not promote the growing of primary industry vigorously. The grain production advantage is not brought to full play, while the three major industries do not promote the economic development coordinately. Agricultural production in Jilin is basically food production, while the animal husbandry in Jilin is basically poultry farming. In Jilin, the added value of agricultural products is low. Because people here pay much attention to food production, and they ignore the pre- and post- production links. The agriculture here does not form a complete system which includes pre- and post- links. The second industry in Jilin still focuses on heavy industry, and mainly depended on automobile and petrochemical industries. The tertiary industry here mainly service for residents' daily life, rather than the production field.

The imperfection of food infrastructure construction. In Jilin, the investment on fixed assets increased rapidly. The number in 1982 was 2.75 billion yuan, while in 2015, it was 1.270427 trillion

yuan. The average annual growth was 33.14%. Among these investments, the primary industry investment was 54.069 billion yuan, accounting for 4.25% of the total investment. The investment ratio was relatively low, causing a number of problems on the construction of food production infrastructure. Take the grain storage facilities as an example [2]. The grain yield of Jilin province reaches a level of more than 32.5 million tons, and the commodity grain is more than 28.5 million tons. But the existing storage volume is 18.75 million tons, and there's a gap of 13.75 million tons. Outdoor storage of grain not only accelerate the quality deterioration, but also bring potential risks to safety production and fire prevention. After the harvest of grain, farmers has to face the problem of insufficient warehouses. It is the most obvious performance of imperfect infrastructure construction in Jilin province.

The lack of agricultural product processing industry. At present, the developed countries are in leading positions in food processing and value-added industries. After processing, the value-added ratio of grain can reach 1:7. But in our country, the ratio is 1:1. There are no leading enterprises of grain processing in Jilin province. Meanwhile, limited by funds and technology, small and medium-sized enterprises can only do the simple processing of raw grain, which leads to the low added value of grain. The food processing industry lags behind. It cannot meet the diversified market demands, and causes the waste of food. It blocks the transformation from food resources to economic and commodity advantages.

Coordination Countermeasures and Suggestions on Grain Production and Economic Growth in Jilin Province

For the last 30 years, the grain production and economic condition of Jilin province developed greatly. But there is still a large gap between economic development and food production level. To maintain the advantage of food production, and to promote the development of economy at the same time, are the targets of economic development in Jilin. To solve these pressing problems proposed in this paper, suggestions are made mainly from the following several aspects.

To optimize the industrial structure, and stretch the food chain. On the basis of agriculture, to transfer the surplus agricultural products into industrial productions, and produce the value-added agricultural products in the circulation process. At the same time, using advanced industrial products into agriculture, and realizing the mutual promotion of primary and secondary industries. The service industry needs to attaches more importance to production industries. Different industries need to cooperate and promote each other [3]. Vigorously encouraging the development of follow-up industries, such as the food processing, distribution and storage industries, and to stretch the chain of grain industry. According to the experience of foreign countries, after the preliminary processing of grain, 1-2 times of added-value can be realized. After the fine processing, the value of grain can be 5 to 10 times higher than before [4]. But the technology of food processing in our country is relatively falling behind, and we need to pay more attention to the development of new technology, in order to realize the changing from food preliminary processing to fine processing.

To improve the construction of commodity grain bases. The economic development of Jilin province lags behind, not because the primary industry occupies the economic resources, but because the advantages of agricultural resources are not used efficiently. We need to effectively use the advantages of Jilin's grain production, and effectively integrate related resources. According to market demands, optimizing planting structure. Constructing commodity grain bases, and optimizing the structure of agricultural production. More importance needs to be taken to industrialization, and trying to form the interaction between fields and workshops. At the same time, catering to market needs. To connect farmers and the market closely, and to ensure the sales of grain products.

To accelerate grain transformation after digestion. To achieve the grain transformation after digestion, food processing enterprises can select special production greed. This method can extend the industrial chain of agricultural products, and increase the value of grain through fine processing. It cannot only deal with overstocking problems, but also create economic benefits. By taking the advantage of rich resources on straw and grain, animal husbandry can be developed to promote

agricultural economy. If there's grain surplus, extra grain can be exported to Japan, South Korea and southeast Asian countries to get foreign exchange earnings.

Policy support. The development of commodity grain bases in Jilin province cannot be achieved without the state's support. At present, the government's agricultural subsidy policy takes some effects, but these improvements are not enough. Improving the benefiting-farmers system in local governments, to clear the directivity of subsidy funds usage, and to improve the efficiency of financial funds usage. Creating a good environment for the economic development of major grain producing regions. Expanding the scope of subsidies, offering more subsidies to new operation subjects. To promote the development of the family farm, professional famers and leading enterprises for agricultural industrialization, and promote the development of grain economy.

Acknowledgement

Project fund: This project is supported by Foundation for the Projects of The 12th Five-Year Plan of Jilin Provincial Department of Education (Document of Educational, Scientific and Cultural Organization of Jilin Province, [2014] No. 45).

References

- [1] Y.J. Zhang, J. Wang, Analysis on grain production fluctuation in Jilin province, *J. Journal of Agrotechnical*. 01 (2007) 74-79
- [2] J.L. Ni, L.N. Zhang and D.Y. Yu, Problems and countermeasures for grain processing industry in Jilin province, *J. Economic Review*. 12 (2008) 58-60
- [3] M.C. Zhang, H.M. Jiang, The plight and countermeasures of agricultural industry structure optimization in Jilin province, *J. Economic Review*. 07 (2016) 74-78.
- [4] S.F. Liang, S.X. Chen and N.W. Yi, Effects, problems and countermeasures of developing farmers' professional cooperative economic organizations in major grain producing areas. Empirical analysis based on the example of Yueyang city in Hunan province, *J. Agricultural economic question*. 08 (2006) 69-71.
- [5] Q.H. Guo, C.M. Sheng, Grain production and overall takeoff of rural economy, *J. Economic Review*. 04 (1988), 40 - 42, 47.