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The Influence of Supply-Side Reform on the Economic Development of Heilongjiang Province

—A Residual Auto-Regressive Model Based on Time Series Analysis

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***Abstract*—In 2015, China's economy entered a new normal. Under the circumstances that stimulating demand was difficult to achieve results and the contradiction between supply and demand appeared intensified, the government turned to reform from the supply side. To explore whether the supply-side reform has reversed the downward trend of economy, alleviated the structural contradiction and reduced the risk of economic imbalance in Heilongjiang Province, this study collected the GDP growth rate of Heilongjiang Province from 1987 to 2015 from National Bureau of Statistics, and optimized the residual autoregressive model to implement the supply-side reform. We also predicted the GDP growth rate two years after the implementation of the police and compared it with the actual situation. The model indicates that 2015 is the turning point of economic development in Heilongjiang Province, with a small economic growth, which is contrary to the law of economic operation of Heilongjiang Province in the past 29 years. The results support that supply-side reform has solved the system problems and eliminated market obstacles in the transformation of three major industries in Heilongjiang Province from the macro level, and achieved some positive policy effects.**

Keywords—Supply-Side Reform; Economic Growth; Residual Auto-Regressive Model

I. INTRODUCTION

A. Historical Causes and Practical Problems Faced by Reform

As early as the end of the 1990s, Heilongjiang Province has attracted national attention because of its economic problems. At this time, it is the early stage of reform and opening up in China. The central government has started a comprehensive reform of state-owned enterprises, and the historical advantages of Heilongjiang Province are gradually disappearing. Of the nearly 30 million laid-off workers in the country, a quarter was from the Northeast. In 2003, the State Council put forward the plan of "Revitalizing the old industrial base in Northeast China". Its basic ideas include transforming a large and rigid state-owned enterprise into a modern enterprise with high efficiency and simplicity; establishing a good partnership with other countries; broadening the economic structure and cultivating a series of emerging industries such as the software industry, artificial intelligence and tourism industry. The effect of this policy is very significant—in the 10 years from 2003 to 2012, the GDP growth rate of the three provinces in Northeast China is more than twice of the original, with an average annual growth rate of 12.7%, and the average national growth rate is 10.7% in the same period. From 2008 to 2012, the annual average growth rate reached 12.4%, about 3% higher than the average level of other provinces at that time, becoming one of the fastest growing regions in China.

However, the economic growth of Heilongjiang Province has fallen rapidly since 2013. Although the national economy was in a downturn at that time, the economic decline of Heilongjiang province still attracted great attention. This phenomenon is the result of the concentrated outbreak of the long-standing defects of the system and mechanism. Take 2015 as an example, Hebei, Jilin, Heilongjiang, Shanxi and Liaoning ranked the last five in terms of GDP growth. Among them, Heilongjiang's GDP growth rate is only 5.7% and it has fallen below 6% for two consecutive years. Yichun and Daqing which used to be the star cities of Heilongjiang Province have even seen negative GDP growth.

The economy of Heilongjiang Province suffered a harsh winter, and the economic growth rate of large state-owned enterprises and energy industries, such as oil and coal, has suffered a precipitous decline. In 2015, the investment growth rate of 25 provinces and autonomous regions was higher than the national average (10%). In contrast, Heilongjiang Province was only 3.1%, 16.9% lower than the previous year. Also in 2015, the growth rate of real estate investment in Heilongjiang Province experienced a decline of more than 20%, which made the general budget revenue of Heilongjiang Province ranked the second lowest (- 10.4%) in China, and other provinces ranking the last were Xinjiang (3.8%), Jilin (2.2%), Shanxi (-9.80%) and Liaoning (- 33.4%) [1].

Before 2015, under the influence of domestic demand, Northeast Revitalization funds and policies were used to support some old northeast industries, which is the most effective and beneficial to government debt. As a result, the number of production lines that should have been eliminated, restricted, modified and upgraded has not declined but increased. In the short run, Heilongjiang province's economy has started a new round of rapid growth, but behind these encouraging data, the quality of economic growth is worrying. When the domestic demand is gradually saturated and the stimulus policy is no longer effective, these problems are gradually exposed: the proportion of private capital in the

economic component of Heilongjiang Province is too small, the industrial upgrading is stagnant, and the overcapacity of heavy industry is generally exposed.

B. Mechanism and Path of Supply-side Structural Reform

The plight of Heilongjiang Province is related to China's overall economic downturn. Although the state's macro-control policy has taken many measures to stimulate aggregate demand, such as the people's Bank of China has repeatedly reduced interest and reserve ratio, and the state has also increased its efforts in investment, but it has not achieved remarkable results. In the economic model dominated by state-owned enterprises and government investment, the phenomenon of private investment being squeezed out is more serious, and the development of private enterprises lags behind, which is not conducive to the long-term and sustainable development of the economy [2].

China has entered a new era. Although economic growth is important, it is not enough. In the current stage, if we want to break through the bottleneck of stagnant economic development, we must put the quality of development first. That is to say, the prominent contradictions faced by Heilongjiang province are not cyclical and total, but structural in the context of the new normal. This kind of prominent structural contradiction cannot be alleviated and solved by the macro-control policy that the government has always been focused on demand. Therefore, only by carrying out supply-side reform and adjusting structural contradictions can the economy achieve long-term and steady growth [3].

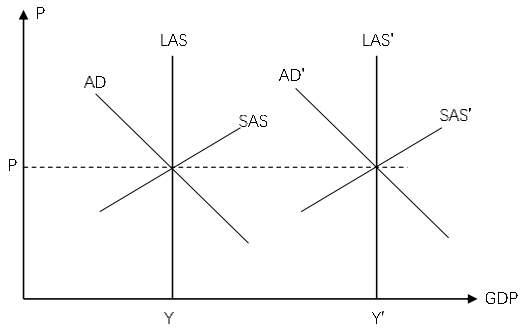

Fig. 1. Total demand and supply curve in the long term

In 2015, President Xi Jinping put forward the idea of supplier reform for the first time. China's macro-economic policy began to shift from demand management to supply management. Through the long-term factors such as the optimization and upgrading of industrial structure, scientific and technological progress and institutional innovation, continuously tap the new potential of economic growth, which strives to move the supply curve to the right, so that Heilongjiang Province can achieve high-quality growth of regional GDP while maintaining stable price level. Finally, Achieve high-quality growth of regional gross output.

Fig.1 is a total demand supply model composed of total demand curve, LAS (Long-Term Total Supply Curve) and SAS (Short-Term Total Supply Curve). The vertical axis is the price level P, and the horizontal axis is the GDP. When considering the long-term fluctuation of the economy, only the progress of science and technology makes the new economic potential be exploited, so as to promote the long-term total supply curve LAS to move to the right, and then drive the total demand to increase substantially, The GDP jumped, while the price level remained at the original level, so as to achieve stable economic growth.

II. THE PATH AND EFFECT OF ECONOMIC STRUCTURE OPTIMIZATION IN HEILONGJIANG PROVINCE UNDER THE BACKGROUND OF SUPPLY SIDE REFORM SELECTING

A. Primary Industry

There is no unified definition of the scope of the first industry in various countries. In China, it generally includes agriculture, forestry, fishery, animal husbandry and intensive industry. Some countries also include mining. The landform of Heilongjiang Province is mainly composed of mountains, platforms and plains. The cultivated land area of the province is 39.5 million hectares, accounting for 84% of the total land area of Heilongjiang province. In other words, Heilongjiang Province, as a large agricultural one, has a high relative abundance of resources and a good environment for agricultural resources, which plays an important role in the country[4].

In order to carry out the supply side reform of the first industry in Heilongjiang Province, the first step is to strengthen the protection of the quality of agricultural land. And take practical actions to improve the quality and utilization efficiency of land. It is necessary to classify, improve, fertilize and renovate. Some specific practices include: setting up black land -a kind of special soil in Heilongjiang Province-protection and utilization pilot area, conducting a large-scale general survey of farmland soil, understanding the pollution situation, and then making the action plan of prevention of soil contamination according to the actual situation and finally implementing it.

Second, we will promote agricultural mechanization to further develop the main crops into mechanization and intelligence, to promote the integrated application of agricultural mechanization technology and to speed up the pace of agricultural modernization in Heilongjiang Province. The third point is to encourage the development of processing industry of agricultural products. A set of deep processing chain for agricultural products will be built, meanwhile we need to increase support for local brands, focus on staple crops such as grain and oil, green food and other characteristic industries, cultivate regional brands and product brands with high market reputation and great influence, give priority to forming a number of high-quality brands with international competitiveness, and promote the transformation and upgrading of agricultural products processing.

Fourth, we should establish an incentive mechanism to encourage innovation in agricultural science and technology. Simultaneously, the transformation of scientific and technological needs to be accelerated, and investment in scientific research funds should be increased form a good atmosphere of developing agriculture through science and

technology. Since the implementation of supply-side reform in 2015, the development of agricultural economy in Heilongjiang Province has shown a good momentum of steady and steady development, which strongly supports the overall development of economy and society in Heilongjiang Province. Agricultural production has grown steadily, and the income of farmers has grown steadily, and continues to exceed that of urban residents. The optimization of agricultural production structure has achieved positive results.

B. Tertiary Industry

The secondary industry refers to the industrial sector that further processes products or raw materials provided by the primary and secondary industries. It can also be subdivided into mining, manufacturing, power, gas and construction. As an old national industrial base, Heilongjiang Province has basic advantages in large-scale, heavy-duty manufacturing industry and related energy industry. However, since the economic activities of Heilongjiang Province have been controlled by large state-owned enterprises and the economy has a strong dependence on them, the development of private enterprises has become slow and difficult. With the accumulation of contradictions, the problem of industrial structure in the province is increasingly prominent. The specific problems are: Private enterprises are not competitive and stable, and the state-owned enterprises are lack of ability in technological innovation, the added value of products is not high, the market is inefficient, and the vitality is insufficient.

In order to promote the reform of the secondary industry in Heilongjiang Province, we should first promote the development of the equipment manufacturing industry in the direction of mechanization and intelligence, promote the industrialization of information, and finally achieve the purpose of improving the production process of traditional manufacturing enterprises in Heilongjiang Province. Second, we need to develop a green and low-carbon economy, and urge traditional and polluting enterprises to actively transform, especially focusing on traditional industries such as coal, petroleum, chemical industry, metallurgy and building materials. We need to carry out environmental protection transformation for them, and further strengthen environmental protection supervision and comprehensive treatment. It is transforming into a big province of green energy and green equipment manufacturing. Third, we should build a technological innovation system based on enterprises. We will deepen the reform of state-owned enterprises and promote the in-depth integration of production, learning and research.

Compared with 2012, the total economic volume of Heilongjiang province increased by 140 billion yuan in 2016, but the contribution of energy industry decreased by 160 billion yuan. This increase and decrease means that the total economic volume of Heilongjiang Province has increased by about 300 billion yuan in four years, which is the result of the continuous adjustment of industrial structure and kinetic energy of Heilongjiang Province after the start of supply side institutional reform.

C. Tertiary industry

The tertiary industry covers a wide range of industries, ranging from small to large, including wholesale and retail, accommodation and catering, housing and other services, transportation, leasing and commercial services, warehousing and postal services, information transmission, computer services and software, finance, real estate, education, health, social security and social welfare, sports and entertainment, and public administration Social organizations, international organizations, etc. can be classified as service industry [5].

The tertiary industry in Heilongjiang Province is mainly supported by tourism. Because most areas of Heilongjiang Province are located in the middle temperate zone, the winter time is long and the weather is cold, with good characteristics of large amount of snow and long snow period. Even in the summer climate, Heilongjiang is also cooler than the south areas, so it has been a national summer resort for visitors from all parts of the country. In addition, Heilongjiang Province also has many rivers and lakes, such as Heilongjiang, Wusuli River, Songhua River and vast forest areas: there are 50 forest parks in the province, including 19 at the national level and 31 at the provincial level. There are also abundant human cultural relics, which makes Heilongjiang Province have rich tourism resources and involve a wide range of fields. Therefore, the benign development of tourism will bring great impetus to the economic development of Heilongjiang Province [6].

However, the unbalanced structure and insufficient supply of quality tourism products in Heilongjiang Province have been perplexing the development of its tourism service industry. Facing the huge consumption demand and consumption capacity of the national market, the supply structure of eco-tourism products in Heilongjiang Province is upgrading slowly, the service consciousness is poor, and the innovation ability is insufficient. For example, Overcharging customers in Heilongjiang snow town and tourist injury by tour guide, which attracted the national attention, have seriously damaged the image of Heilongjiang Province, which reflects the common problems in the tourism industry of Heilongjiang Province, namely, the supply of tourism consumption for hot spots has not kept up with the consumption demand of blowout.

For a large tourism province, the consumption demand is mostly a thing conducive to the long-term development of scenic spots. However, due to inadequate supervision and even no actions, the quality of tourism products is unsatisfactory and businesses are lack of good credit and contractual spirit since profit is the most important thing for local shopkeeper. It results in poor design of tourism areas, inconvenient transportation, irregular ticket sales, rampant scalpers and so on. Therefore, it is very important for the healthy development of the tourism industry to make the management of the scenic area from chaos to order. The government and relevant departments need to actively explore tourism governance, constantly improve relevant regulations and establish a supervision and punishment mechanism, and achieve normalization and long-term effect. In addition, it is difficult to form a tourism industry cluster and the consumption level is low in Heilongjiang Province, which seriously restricts the sustainable development of tourism industry[7].

To promote the supply-side reform of tourism in Heilongjiang Province, we must first improve the effective utilization of resources and strengthen the effective supply. For example, at present, there is a big gap between the diversification of tourism products and the utilization of resources and the developed tourist area. Due to the seasonal limitation of resources, many scenic spots have the problems of short operation time. Overload in peak season, no one in off season, and low utilization rate of resources. Especially those scenic spots with ice and snow culture as the brand. The monotonous tourism products not only cause the local financial pressure, but also restrict the development and promotion of scenic spots.

Therefore, we should increase the innovation of tourism service, break seasonal restrictions, and develop all seasons tourism products to balance the slack season and peak season, so as to provide tourists with balanced, high-quality and effective tourism service. Secondly, it is necessary to integrate relevant resources and industries in the region, comprehensively improve the ecological environment, public service system, management mechanism and the service consensus of all stakeholders, realize the integration of all tourism related resources in the province, promote the overall high-quality development of tourism, and also promote the coordinated development of the overall social economy through tourism. Therefore, on the one hand, the development of Heilongjiang eco-tourism requires us to improve the supporting elements under the existing resources, and at the same time, we should deeply integrate with other industries, such as forest industry, fishery, animal husbandry, culture, agriculture, etc. we should make use of the industrial advantages of Heilongjiang Province to realize the complementary advantages with the tertiary industry, to meet the experience needs of tourists and to provide effective eco-tourism supply [8] [9].

One year after the implementation of the supply-side reform policy, the contribution rate of the tertiary industry to GDP growth in Heilongjiang Province has exceeded 80%. In the tertiary industry, the contribution rate of tourism is more than 70%. The total tourism revenue and the total number of tourists reached 136.143 million yuan and 130 million people respectively, both of which achieved double-digit growth[10].

III. An Empirical Analysis of the Influence of Supply-Side Reform on the Economic Development of Heilongjiang Province

A. Data Analysis and Inspection

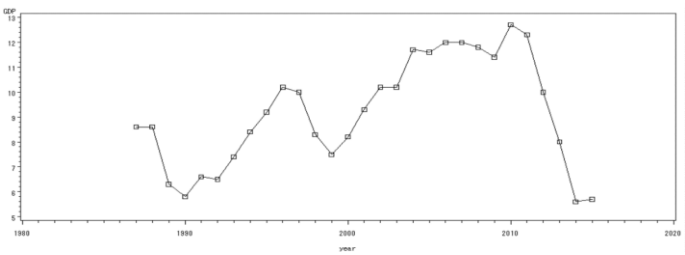

Fig. 2. Sequence chart of GDP growth rate of Heilongjiang Province from 1987 to 2015

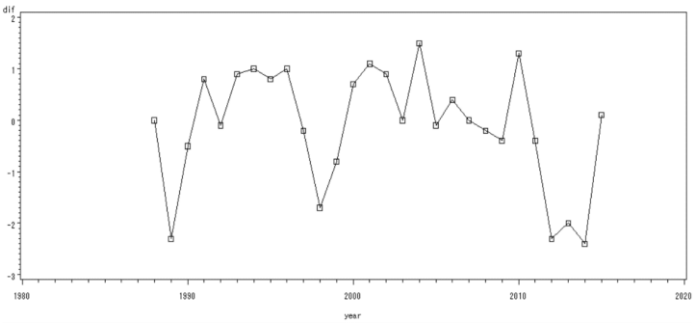

Fig. 3. Output results of unit root test

Augmented Dickey-Fuller Unit Root Tests

Type	Lags	Rho	Pr < Rho	Tau	Pr < Tau	F	Pr > F
Zero Mean	0	-15.7296	0.0026	-3.27	0.0020		
	1	-21.3100	0.0002	-3.35	0.0017		
Single Mean	0	-15.8712	0.0152	-3.22	0.0291	5.20	0.0410
	1	-21.2683	0.0017	-3.27	0.0269	5.40	0.0356
Trend	0	-16.8654	0.0633	-3.28	0.0908	5.39	0.1418
	1	-24.2327	0.0044	-3.73	0.0378	7.39	0.0346

Fig. 4. Output results of unit root inspection

Autocorrelation Check for White Noise

To Lag	Chi-Square	DF	Pr > ChiSq	Autocorrelations					
6	6.68	6	0.3517	0.412	0.071	-0.078	-0.154	-0.068	-0.031

Fig. 5. White noise test output

First, judge the stationarity and pure randomness of the sequence. From the sequence chart 3.1, it can be seen that the sequence fluctuates greatly and is significantly non-stationary. After unit root test, the results are as follows: the output of the first column in Figure 3.2 is the model type of test, the output of the second column is the autocorrelation delay order of the sequence, the output of the third and fourth columns is the value of Rho statistics and the test p value. The fifth and sixth columns output the value of tau statistic (τ) and the test p value[11].

According to the output results of the fifth and sixth columns, we can judge that when the significance level α is 0.05, the sequence is non-stationary. Therefore, the sequence diagram 3.3 is obtained after the first-order difference of the sequence. Through visual judgment, the sequence diagram has no obvious trend. The output results of unit root test are shown in Figure 3.4 and figure 3.5. According to the output results of the fifth and sixth columns in Figure 3.5, it can be judged that when the significance level α is 0.05, the sequence is basically stable.

White noise test showed that P value was 0.3517, which was significantly higher than α = 0.05. There is no correlation between the sequence values. It is a white noise sequence. The reason for this test result may be that the variance of GDP growth rate sequence from 1987 to 2015 in Heilongjiang Province is not homogeneous.

B. Model Establishment and Prediction

Because the initial analysis of the data shows that the original sequence is non-stationary and the first-order difference sequence is a white noise sequence, it is preliminarily considered to fit the conditional heteroscedasticity model arch to the GDP growth rate sequence from 1987 to 2015. To fit arch model, first of all, arch test is needed.

Ordinary Least Squares Estimates

SSE	114.610266	DFE	27
MSE	4.24482	Root MSE	2.06030
SBC	128.886032	AIC	126.15144
Regress R-Square	0.1535	Total R-Square	0.1535
Durbin-Watson	0.3152	Pr < DW	<.0001
Pr > DW	1.0000		

Fig. 6. Output results of general least squares estimation

Estimates of Autocorrelations

Lag	Covariance	Correlation	-1 9 8 7 6 5 4 3 2 1 0 1 2 3 4 5 6 7 8 9 1
0	3.9521	1.000000	| |**********
1	2.9044	0.734902	| |**********
2	1.3225	0.334627	| |*******
3	0.1391	0.035198	| |*
4	-0.5684	-0.143816	| ***|
5	-0.6849	-0.173300	| ***|
6	-0.6056	-0.153228	| ***|
7	-0.7063	-0.178707	| ****|
8	-0.6421	-0.162463	| ***|
9	-0.5447	-0.137832	| ***|
10	-0.6331	-0.160199	| ***|

Fig. 7. Residual sequence autocorrelation

According to figure 3.7, the 10th order delay autocorrelation chart of Heilongjiang GDP growth rate sequence shows that the residual sequence has at least 2nd order significant autocorrelation.

Q and LM Tests for ARCH Disturbances

Order	Q	Pr > Q	LM	Pr > LM
1	9.5136	0.0020	15.4520	<.0001
2	9.5405	0.0085	16.4805	0.0003
3	9.5470	0.0228	18.8477	0.0003
4	10.2092	0.0370	19.2903	0.0007
5	10.4446	0.0636	19.6076	0.0015
6	10.4747	0.1060	20.1805	0.0026
7	10.7381	0.1505	20.7371	0.0042
8	11.1086	0.1956	21.4384	0.0061
9	11.3756	0.2508	21.6458	0.0101
10	11.5002	0.3199	21.7041	0.0167
11	11.5231	0.4005	21.8973	0.0252
12	12.2778	0.4236	21.9001	0.0387

Fig. 8. Least squares estimation after mean removal

The results of heteroscedasticity test show that the residual sequence has a certain degree of heteroscedasticity, and the results of long-term correlation LM test show that 1-12 order arch model can be established. Considering the test results of autocorrelation and heteroscedasticity of residual sequence, we try to fit arch (5).

GARCH Estimates

SSE	157.644022	Observations	29
MSE	5.43600	Uncond Var	5.43140371
Log Likelihood	-52.045253	Total R-Square	.
SBC	117.55969	AIC	112.090506
Normality Test	5.1304	Pr > ChiSq	0.0769

Variable	DF	Estimate	Standard Error	t Value	Approx Pr > |t|
Intercept	1	6.6588	0.6861	9.71	<.0001
t	1	0.2170	0.0397	5.47	<.0001
ARCH0	1	0.8469	0.6391	1.33	0.1852
ARCH1	1	0.8441	0.5309	1.59	0.1118
ARCH2	1	-1.47E-19	8.994E-16	-0.00	0.9999
ARCH3	1	7.877E-20	5.297E-13	0.00	1.0000
ARCH4	1	-2.05E-18	1.138E-15	-0.00	0.9986
ARCH5	1	6.776E-19	7.696E-16	0.00	0.9993

Fig. 9. General least square estimation of model 1

GARCH Estimates

SSE	35.8429772	Observations	28
MSE	1.28011	Uncond Var	.
Log Likelihood	-41.328101	Total R-Square	0.7346
SBC	99.317225	AIC	92.6562024
Normality Test	1.3195	Pr > ChiSq	0.5170

Variable	DF	Estimate	Standard Error	t Value	Approx Pr > |t|
Intercept	1	0.6621	0.9944	0.67	0.5055
lagx	1	0.9448	0.1022	9.25	<.0001
ARCH0	1	0.3600	0.4113	0.88	0.3814
ARCH1	1	0.1539	0.1969	0.78	0.4343
ARCH2	1	0.8953	0.7259	1.23	0.2174
ARCH3	1	-1.9E-19	3.663E-13	-0.00	1.0000
ARCH4	1	6.254E-18	3.414E-13	0.00	1.0000
ARCH5	1	0	4.99E-15	0.00	1.0000

Fig. 10. General least square estimation of model II

The arch model program of SAS software provides two fitting schemes for the sequence. However, it can be seen from the results that except for λ_2 significance, all other parameters of model 1 fail to pass the parameter significance test. However, model 2 fails to pass the parameter significance test from parameter λ_0 to λ_5. The fitting of the two models is not ideal. Therefore, although the sequence residuals have the characteristics of heteroscedasticity, the heteroscedasticity model arch still has no way to explain the information contained in the sequence. Next, we try to fit the residual autoregressive model:

Maximum Likelihood Estimates

SSE	28.6065263	DFE	26
MSE	1.10025	Root MSE	1.04893
SBC	86.9085409	AIC	84.2441319
Regress R-Square	0.9687	Total R-Square	0.9886

NOTE: No intercept term is used. R-squares are redefined.

Variable	DF	Estimate	Standard Error	t Value	Approx Pr > |t|
lagx	1	0.9767	0.0357	27.38	<.0001
AR1	1	-0.4095	0.1842	-2.22	0.0351

Autoregressive parameters assumed given.

Variable	DF	Estimate	Standard Error	t Value	Approx Pr > |t|
lagx	1	0.9767	0.0344	28.35	<.0001

Fig. 11. Final fitting model I output results

The maximum likelihood estimation is selected in the fitting of the model, and all the components of the model output by SAS are significantly effective, and the decision coefficient is as high as 0.9886. The SBC and AIC of the model are in a reasonable range, and the final fitting model 1 is:

$$\begin{cases} x_t = 0.9767 x_{t-1} + \varepsilon_t \\ \varepsilon_t = 0.4095 \varepsilon_{t-1} + a_t, \quad a_t \sim N(0, 1.10025) \end{cases} \tag{1}$$

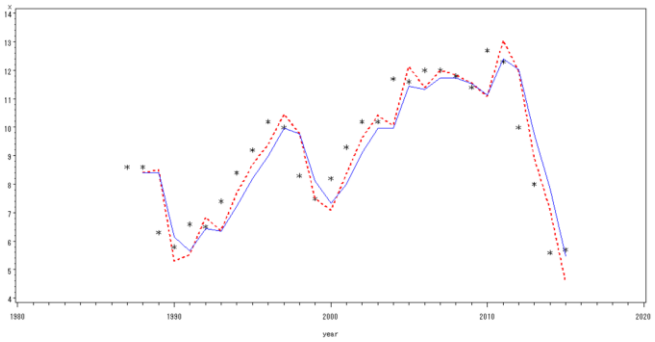

Fig. 12. Regression model fitting effect with delay dependent variable

Maximum Likelihood Estimates

SSE	24.0280286	DFE	25
MSE	0.96112	Root MSE	0.98037
SBC	92.371032	AIC	86.9018487
Regress R-Square	0.0528	Total R-Square	0.8225
Durbin-Watson	1.9088	Pr < DW	0.3248
Pr > DW	0.6752		

testing positive autocorrelation, and Pr>DW is the p-value for testi

Variable	DF	Estimate	Standard Error	t Value	Approx Pr > |t|
Intercept	1	7.8007	1.3724	5.68	<.0001
t	1	0.0883	0.0868	1.02	0.3187
AR1	1	-1.3259	0.1720	-7.71	<.0001
AR2	1	0.6040	0.2197	2.75	0.0110

Autoregressive parameters assumed given.

Variable	DF	Estimate	Standard Error	t Value	Approx Pr > |t|
Intercept	1	7.8007	1.2949	6.02	<.0001
t	1	0.0883	0.0748	1.18	0.2490

Fig. 13. Output results of final fitting model II

Selecting the maximum likelihood estimation fitting model, it is found that DW test value is as high as 1.9088, which means its correlation is very low, and the p value of the fitting model is 0.3187more than α(0.05), so model II can't effectively fit the fluctuation of the sequence. To sum up, the final fitting model is determined as:

$$\begin{cases} x_t = 0.9767 x_{t-1} + \varepsilon_t \\ \varepsilon_t = 0.4095 \varepsilon_{t-1} + a_t, \quad a_t \sim N(0, 1.10025) \end{cases} \tag{2}$$

This model forecasts the GDP growth rate after two years of supply side reform. The expected growth rate in 2016 is 5.6617%, while the actual growth rate in Heilongjiang Province in 2016 is 6.1%; the expected growth rate in 2017 is 5.5684%, while the actual growth rate in Heilongjiang Province in 2017 is 6.4%. This is the first time that the economic data of Heilongjiang Province has been greatly improved since 2010, which shows that the supply-side reform policy is indeed true that it can break the shackles of development, optimize the old industrial structure and adapt to the development trend.

IV. Summary

First of all, this paper combs the historical causes of the economic downturn in Heilongjiang Province, and deeply analyzes its environmental degradation, structural imbalance, development stagnation and other issues. Then from the three dimensions of agriculture, industry and service industry, it explains how supply-side reform can adjust structural contradictions and achieve long-term economic growth. The third part of this study is empirical research, we choose the GDP growth rate of Heilongjiang Province from 1987 to 2015 to explore its fluctuation law, and fit the residual autoregressive model which has a good effect. At the same time, it forecasts the GDP growth rate within two years after the implementation of the supply-side reform policy. Through the comparative analysis with the actual growth, it is found that the supply-side reform policy plays a key role in the economic recovery of Heilongjiang Province. If there is no reform, the economy of Heilongjiang Province will continue to go down.

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