

The Research of Intrinsic Mechanism of Economic Development --Empirical Analysis of Jiangsu Economic Development

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Abstract

This paper focuses on economic transformation to profoundly analyze the economic dynamic structure characteristics of Jiangsu Province since the "11th Five-year plan". On the basis of the New-classical Economic Growth Theory and R • Lucas's Theory of Neo-economic Growth.

the article establishes a multiple regression extension model relevant to factors including human capital, science and technology, energy efficiency, urbanization level and industrial structure contribute to economic growth. Next, on the basis of the regression model the article makes a computation about economic development, predicts economic development trend of the next decade and upgrading. In the end ,the author makes some effective suggestions indicating that the strategy of boosting domestic demand should be implemented and it is critical to rely on scientific and technological progress .

Key words: Economic development, growth engine and mode transformation, measures and solutions

Introduction

With regard to China,"Twelfth Five-Year "period is a critical period for construction of a comprehensive well-off society, deepening reform and opening up and accelerating the of economic development transformation. Meanwhile, it is also a critical period for Jiangsu to accelerate achieving "the first two". It is important to solve the deep conflicts in economic operation, strengthen intrinsic motivation of sustainable development and promote a long-term stable and rapid economic development as well as advance social harmony.

Results

1. Structural characteristics of the economic growth momentum

According to relevant studies, factors including consumption, investment and net exports power which promote economic growth have the following characteristics:

(i) The contribution rate of consumption grows steadily. From 2000 to 2012, the average annual consumption of Jiangsu province contribution rate was 42.4%, subsequently increase the region's average annual GDP by 5.5 %. In 2011, economic growth stabilize gradually and the contribution rate of consumption was 48.5%, Besides,the gap between contribution rate of consumption and contribution rate of investment rapidly reduced to 10.6 %. The contribution rate of consumption increased to 50.3% in 2011 and in 2012 this rate was 49.4%. The trend illustrates the economic growth is mainly driven by consumption.

(ii)The investment contribution rate fluctuate greatly. Investment has a multiplier - accelerator effect, which play an important role in the economic growth. In 2012, the gross capital formation of Jiangsu province was 2.75697 trillion yuan, which was 46.9 times of the number in 1990. And this rate turned into 51% in 2012. according to the chain growth speed of Jiangsu citizens' gross consumption and capital formation over the years , the gross capital formation grow in great volatility. Gross capital formation had an average annual growth rate of 14.4%, which is 3.4% higher than the growth rate of gross consumption.

(iii) Net export contribution rate decreases gradually. Net export contribution rate was 13.7% in 2001 , The province's respective net export contribution rate to economic growth in 2009, 2010 and 2011, decline-9.8%,6% and 0.6%. From 2000 to 2010, the range of net export contribution rate was 35.9%, while the range of contribution rate of investment and consumption were respectively 38.7% and 28.4%.The standard deviation of Jiangsu's net export growth rate was 31.6% while the gross capital formation was 12.5% and the final consumption was 8.3%.

2. characteristics of economic growth driving force

Based on Lucas theory of economic growth, by utilizing human capital expansion model

$$LnY_t = C + \alpha_1 Ln(K_t) + \alpha_2 Ln(h_t L_{t,t}) + \alpha_3 Ln(NY_t) + \alpha_4 (Ha_t) + \alpha_5 (FDIK_t) + \alpha_6 Ln(RDK_t) + \alpha_7 (CI_t) + \alpha_8 (MI_t) + \alpha_9 (SI_t) + \alpha_{10} (TI_t) + \alpha_{11} (CIXF_t),$$

the following statistics can be obtained.

Table 1 contribution rate of production factor and the contribution rate of total factor productivity (Unit: %)

Year	Contribution rate of capital	Contribution rate of human resource	Contribution rate of energy	Contribution rate of TFP
1990-2000	14.27	19.46	5.77	60.50
2001-2011	14.68	14.68	14.47	57.49
1990	16.57	42.10	11.98	29.34
1995	13.20	13.07	10.27	63.45
1996	15.66	19.46	1.10	63.78
1997	15.09	18.55	-2.09	68.45
1998	16.42	19.17	2.44	61.97
1999	16.40	19.74	0.94	62.92
2000	15.44	22.66	8.78	53.12
2001	15.21	11.62	5.19	67.98
2002	13.17	11.21	11.86	63.76
2003	14.58	9.44	18.73	57.26
2004	14.10	8.67	26.81%	50.42
2005	15.72	8.82	27.66	47.80

2006	14.07	13.61	12.38	59.94
2007	13.24	18.63	13.33	54.79
2008	14.48	14.91	8.15	62.47
2009	16.54	16.68	9.00	57.78
2010	15.65	20.02	11.58	52.75

The research results of transformation of Jiangsu economic development model shows:

(i) Contribution of material resources and human capital decreased. From 1990 to 2000, material capital contribution rate to economic growth of Jiangsu was 14.27%, contribution rate of human capital was 19.46%, contribution rate of energy was 5.77% and contribution rate of total factor productivity was 60.50%. From 2001 to 2011, material capital contribution rate to economic growth of Jiangsu was 14.68%, contribution rate of human capital was 13.36%, contribution rate of energy was 14.47% and contribution rate of total factor productivity was 57.49%. but Jiangsu’s contribution rate of physical capital and human capital are below the national level. ¹

(ii) The energy contribution rate from 2001 to 2011 is 2.5 times that of the previous decade. It illustrates that the energy played a positive role in boosting the economic development from 2001 to 2011. However, the excessive consumption of non-renewable energy will be unsustainable.

(iii) Compared Jiangsu’s contribution rate of TFP with national level, Jiangsu was 18.5% higher than the national level from 1990 to 2000; and during 2001 to 2011, it was 20.14% higher than the national level. introduction of foreign capital, human capital flow-out, urbanization, market-oriented and industrial structure adjustment. Refer to GNP per person, Jiangsu reached 68,347 yuan (10,827 U.S. Dollars) in 2012, which is 1.8 times of the national average level. In addition, total factor productivity in Jiangsu also exceeded the national average level. From the aspect of time variation, compared with the period of 1990 to 2000, Jiangsu total factor productivity dropped three percentage points.

Accounting and forecasting of economic growth

Table 2 Growth rate of different factors over different periods and changes of factors (Unit: %)

Period	1990-2000	2001-2010	2011-2020(I)	2011-2020 (II)
Annual growth rate				
Physical capital	14.18	15.34	12	8
Human resource	3.18	2.50	2.0	2.0
Energy	4.55	11.78	7	5

¹ Xiaolu, W., & Gang, F., “Transformation and sustainability of Chinese economic growth mode”, Economic Research

Year	2000	2010	2020(I)	2020(II)
Per capita level of education (per year)	8.66	10.21	12.2	12.2
Proportion of foreign investment	8.72	5.58	3	2
Expenditure on science and technology	0.854	2.1	3.1	3.3
Proportion of college or higher educated	5. 96	15. 47	24.0	24.0
Urbanization rate	41.5	60.58	75	75
Marketization rate	12.68	34.46	40	40
Proportion of tertiary industry	35.88	41.35	48	48
Dependence on foreign trade	44.17	76.12	60	50
Consumption rate	43.38	41.61	46.61	49.61

Note: According to the Jiangsu education department’s plan,the per capita level of education will reach 12.2 years in 2020.Foreign investment refers to the actual use of foreign capital accounted for the proportion of investment in fixed assets. Technology refers to that proportion of research and development accounted for GDP.

(1) Physical capital. It had an average annual growth rate of 14.18% from 1990 to 2000 and from 2001 to 2010 the average annual growth rate was 15.34%. There are two scenarios. Refer to the first scenario, there is a slight reduction on investment. Proportion of investment stayed in 12% from 2011 to 2020, which indicates that investment still played an important role. the second scenario reduced by one-third, made the investment growth rate kept at 8%. The result showed an extremely high absolute number of investments.

(ii) Human resource. Be defined as effective labor, which is the result of the quality of potential labor multiply by the quantity of potential labor. According to Jiangsu Province Education Development Plan, in 2020, the province’s years of education per capita will reach 12.2 years and the population of potential labor force will be 55 million, can infer human capital on-year growth of about 2%.

(iii) Energy: From 1990 to 2000 average annual growth rate of energy was 4.55%. However, from 2001 to 2010 the rate jumped to 11.87%. The extremely fast speed of increase was related to the rapid economic development of energy consumption.The provincial departments mentioned that in 2020 the average energy consumption per 10,000 yuan of GDP will reduce by 40%. Consequently, it can be inferred that energy growth rate was 6% in the first scenario and 4% in the second scenario.

(iv) Actual utilization of foreign investment. In 2000 the actual utilization of foreign capital accounted for 8.72% of the total investment while in 2010 this number changed to 8.72%. It can be forecasted that in 2020 the number will be 3% in scenario I and 2% in scenario II. In the future, the proportion of foreign investment in total investment will gradually reduce with the rise of labor costs and the cost of doing transactions.

(v) Science and technology capital. Expenditure on R & D in 2000 accounted for 0.85% of the region's annual GDP and accounted for 2.1% in 2010. It can be predicted that in 2020 the proportion of R & D expenditure in regional GDP will be 3.1% in scenario one and 3.3%.

(vi) Per capita level of education. By 2020, per capita education years will be 12.2 years.

(vii) Proportion of college or higher educated. Based on the number of higher education graduates in Jiangsu Province, it can be estimated that by 2020 proportion of college or higher educated will reach 24%, which will increase approximately 0.85% annually.

(viii) Urbanization. The urbanization rate of Jiangsu was 41.5% in 2000, 61.5% in 2012 and will reach about 75% by 2020.

(ix) Marketization. The marketization rate of Jiangsu was 12.68% in 2000, 34.46% in 2010 and will reach about 40% by 2020.

(x) The proportion of tertiary industry. The proportion of tertiary industry of Jiangsu was 35.88% in 2000, 41.35% in 2010 and will reach about 48% by 2020.

(xi) Dependence on foreign trade. Dependence on foreign trade in Jiangsu was 44.17% in 2000, 76.12% in 2010. By 2020 it will reach about 60% in scenario one and 50% in scenario two.

(xii) Consumption rate. Be 43.38% in 2000 and 41.61% in 2010. By 2020, the rate will reach about 46.61% in scenario one (increase by 0.5% annually and 49.61% in scenario two (increase by 0.8% annually). shown in table 3.

Table 3: Forecasts on Jiangsu Province economic development -on the basis of two different scenarios (Unit: %)

	2001-2010	2011-2020(I)	2011-2020(II)
Actual Growth Rate	13.23		
Calculated Growth Rate	13.33	10.72	9.73
Factors Contribution	5.69	3.94	3.1
Physical Capital	1.94	1.52	1.01
Human Resource	1.76	1.41	1.41
Energy	1.99	1.18	0.84
Total Factor Productivity Contribution	7.64	6.61	6.46
Human Resource Spillover	1.74	1.66	1.66
Foreign Capital Effect	-0.67	-0.55	-0.77
Technology Capital Effect	0.877	0.7	0.77
Urbanization	1.31	0.95	0.95
Marketization	1.36	0.33	0.33
Structural Adjustment	1.66	2.02	2.02
Foreign Trade Effect	0.465	-0.02	-0.38
Combined effect of Urbanization and Consumption	0.9	1.52	1.87

2. Suggestions on enhancing intrinsic motivation of economic growth

(i) Promote economic endogenous growth proposals. Firstly, it is proposed to increase domestic demand and improve the consumption policy. promote the holiday economy and improve the rate of broadband households. Secondly, it is suggested to improve citizens' consumption capability. For instance, it is advised to increase subsidies for home appliances to the countryside, energy-saving products and green food. Besides, implementation of benefiting the agriculture policy .enhance supply level of education, health care and other public goods as well.

(ii) Speed up the pace of optimization and upgrading of industrial structure. First,,we improve relative policy rules and accelerate the transformation and upgrading of traditional industries. Government is responsible for formulating scientific industrial structural adjustment policies, adopting tax incentives and financial supporting measures, focusing on the development of advanced service industry and high-tech industry.

(iii) Enhance capacity of scientific and technological innovation. the first place, it is suggested to cultivate enterprises' innovation capability, integrate industry, study and research. In addition, it is advised to accelerate the transformation of scientific and technological achievements, nurturing intellectual property, creat Jiangsu's own brand with intellectual property rights. Enhancing the technological innovation capability of enterprises is also a critical point.The final advise is to promote innovation and development of high-tech zones,

(iv) Strengthen driving force of reform and opening up. First, it is necessary to accelerate reformation of investment and financing system, adjust and optimize the investment structure to improve the quality and efficiency of investment.Also accelerating the transformation and upgrading of foreign trade. strengthen construction of export brand and export product quality and safety demonstration bases. Second, it is suggested to create new advantages of an open economy on the basis of optimizing economic structure, expanding the economic depth and improving economic efficiency. Meanwhile, measures should be taken to adjust economic structure and increase imports of advanced technology, key equipment and important energy and raw material. Third, it is cirtical to improve the utilization effective of foreign capital and guide foreign capital to invest in high-tech industries, modern services and modern agriculture.

References

1. Xiaolu,W.&Gang,F.(2009), "China's economic growth mode transformation and growth sustainability", *Journal of Economic Research* ,1, 4 - 16.
2. Nengkuan,W.(2010), "Expanding domestic demand to promote economic development pattern",*Journal of Economic Research*, 65 .
3. Zhiyong, F.&Jun, H.(2009), "Empirical research of domestic demand promoting effect on economic growth ", *Journal of Industrial economy* Vol.28, 9.
4. Xin Lu, "Cointegration and causality test of GDP and consumer spending levels - an empirical analysis of Shanghai statistics from 1978 to 2004", *Journal of World Economic Analysis*, 10.