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Quantitative Analysis of R&D Investment Impact on Agricultural Economy Based on Panel Data

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Abstract

Agriculture is the basic industry of our country, the development of agricultural economy in relation to the overall goal of modernization in china. With the contribution of science and technology to economic growth gradually strengthen, countries will also application of science and technology to improve the competitiveness of the agricultural economy. In this paper, we analyze the influence of R&D investment on agricultural economy based on panel data, the result shows that: there exist a long-term stable equilibrium relationship between R&D investment and agricultural economy, the influence coefficient of R&D investment to agricultural GDP is 0.19. Meanwhile, agricultural researchers also have 0.10 elastic contributions to agricultural economic growth, so that agricultural talent is also an important factor of agricultural economy. Therefore, the government should strengthen investment in agricultural, improve the technological innovation ability and establish long-term mechanism of continuous fund supply for agricultural science and technology innovation.

Keywords: *R&D Investment, agricultural economy; empirical analysis; panel data*

1. Introduction

Relating to agricultural economy development of our country the smooth realization of economy's development in an all-round way, but for a long time, capital, mechanism, technology, professionals *etc*. various factors restrictions, the development of economy of our country agriculture and Realization of agricultural modernization of the grand goal is far from [1]. At present, our country agriculture comprehensive production capacity increase slowly, the agricultural development lack of sustainability, the overall level of economic development of agriculture still cannot meet the demand of the overall development of the national economy. All these will influence the process of agricultural modernization in China. "Science and technology is the first productivity", the development of agriculture will be more inseparable from the support of science and technology, development of agricultural economy to agricultural science and technology provide inexhaustible power [2]. R & D activities as the research foundation and the core that reflects both a national and regional scientific and technological investment degree, the level of scientific and technological content and level of technological development the important content, is compared to a national and regional knowledge accumulation, the capability of independent innovation and innovation oriented society made an important indicator of the development process.

However, China's investment in agricultural science and technology status is not the smug, government finance to agriculture total investment showed an overall growth trend, but the intensity of investment in agricultural science and technology is a downward trend, in investment structure and distribution, basic research, applied research on and test development investment ratio imbalance. Researcher

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investment status is scientific research personnel uneven regional distribution, especially the lack of professional personnel, and technology promotion personnel not to go under, less average funding of scientific research personnel, professional personnel and to retain, the phenomenon of waste of human resources generally. "Twelfth Five Year Plan" is the key period of China's economic development mode transformation and the readjustment of the economic structure, how to further eliminate backward production capacity, promote industrial upgrading, investment in science and technology play a decisive role. The "Twelfth Five Year Plan" also made it clear that to enhance scientific and technological innovation ability, pay attention to enterprise construction independent innovation system, promote scientific and technological achievements into productivity change. Economic growth mode to realize the transformation from extensive to intensive direction, the optimization and upgrading of regional industrial structure rely on scientific and technological progress, and the progress of science and technology is inseparable from the effective scientific and technological input. Similarly, the effective growth of agricultural economy in addition to relying on the basic factors of production investment, need more investment in science and technology play its contribution in the field of agriculture, as of investment in agricultural science and technology on agricultural economic growth, it is necessary to investigate the relationship between the agricultural science and technology input and agricultural GDP growth. Funds for agricultural science and technology input level, is a measure of a key factor in the national agriculture science and technology strength, and agricultural science and technology investment directly affects the growth of agricultural science and technology progress and agricultural economy. Therefore, it has certain theoretical significance and practical significance of this thesis.

Agriculture is the basic industry of our country, the development of agricultural economy in relation to the overall goal of modernization in china. With the development of science and technology to economic growth contribution gradually to strengthen, countries will also application of science and technology to improve the competitiveness of the agricultural economy. However, the improvement of the level of science and technology is inseparable from the strong support of science and technology investment, especially agriculture science and technology investment structure and strength, will have a direct impact on the long-term development of the agricultural economy. Investment in science and technology is the source and motive force of the development of science and technology, the effective investment in science and technology to bring the progress of science and technology, so as to serve the economic development. This paper is the analysis on the basis of China's investment in agricultural science and technology and the current situation of agricultural economy in, to agricultural science and technology investment as a starting point, to analyze the influence of the growth of agricultural economy. This article has important practical significance to study. The in previous mature economic growth based on the theory, combined with the actual data of the provinces, to take a suitable index system, using provincial panel data model, can reflect the provinces of agricultural science and technology input and contribution to the growth of agricultural economy. Through exploring investment in agricultural science and technology in economic growth effect, to the agricultural economy from extensive growth to intensive direction changes provide a new path, and combined with the investment in agricultural science and technology in the existing problems and influencing factors, put forward the corresponding policy recommendations. Therefore, this thesis also has a certain practical significance.

2. Literature Review

2.1 R&D Investment and Economic Growth

Denison Denison (1967) in the full consideration of the types of capital and labor quality on the basis, comprehensively analysis the progress of knowledge, resource allocation, influencing factors for economic growth contribution. In the years 1962-1982, Denison use growth rate equation for a comprehensive study of the economic growth situation of more than 10 countries, and estimates the science and technology progress contribution to the national economic growth is about 50% - 70%. Lefebvre (2002) focuses on the research on the public agricultural research of rate of return and between different producers in distribution [3]. The results show that, even in the United States, Japan and other developed countries, the improvement of agricultural products and Research on the social return rate is very high, however, in developing countries, the social rate of return will only bureau. Romer (1986) and Lucas (1988) that technological progress is the motive of the economic development of Romer to scientific and technological progress and the accumulation of knowledge as the key factor of the economic growth in the long run, and in new classical economic theory, is put forward for the first time in economic growth model [4].Griliclies (1986) emphatically analysis the American 1000 large-scale manufacturing enterprises in the relevant socio-economic statistical data, the conclusion shows that investment in science and technology can effectively promote productivity development, and basic scientific research output contribution rate is far greater than other indicators of the contribution rate, the Government R & D investment plays a vital role to improve enterprise productivity. Solow first use C-D production function, and in the United States, relevant statistical data as the foundation, focused on the relationship between technology change rate and the growth rate of output, the study found, 87.5% of the total per capita output growth is by the technical progress of, and only 12.5% of the output increase is rely on the input of production factors to the.

Results show that the total number of a country's R & D expenses and engineers and scientists can probably explain up to 50% of GDP growth among the differences. In addition, enterprise R & D investment relative to government investment, the former is more conducive to productivity is raised [5]. Coe and Helpman (1995) based on sample data of 21 countries worldwide, the effects of the relationship between investment and productive forces of all countries. The results show that, with the country's trading partners R&D expenditure is almost can explain up to 50% of the OECD countries GDP growth. Conclusion also said foreign R & D funds stock status significantly affect the level of total factor productivity and the influence in the relatively small countries is more obvious [6]. Charles (1998) analysis of the statistical data of ten OECD countries, found that R & D expenditure is an important source of total factor productivity growth, through the analysis of the coefficients of the estimation results and R&D investment return rate between relationship that low investment in R&D, and return on investment rate is underestimated, because 30% of R&D investment rate of return is a conservative estimate, then the actual optimal R&D investment quota should is more than four times the actual data. Lau and Boskin (2000) through the analysis of the data for the G-7 countries, the use of econometric methods to estimate the effect of capital input to economic growth and the progress of science and technology. Research found that in the national sample data, science and technology progress contribution rate to economic growth in more than 50%. The article thinks that only source of scientific and technological progress in the investment of human capital and physical capital, higher capital levels of countries and the scientific and technological progress rate is

also high. Bruno and guellec (2001) focuses on the analysis of the OECD report, to explore the effects of various types of spending on research and development of multi factor productivity. Through the investigation of 1980-1998 year 16 OECD countries the relevant statistical data, using econometric model, the spillover effect of R & D was calculated [7].

2.2 Science and Technology Investment in Agriculture

Savrul (2014) using autonomous regions and time sequence and provincial cross section data, respectively from the labor, energy, land, irrigation area, fertilizer and input of scientific research six elements to estimate the respective on agricultural economic rate of return [8]. Estimated investment in science and technology to economic yields, by using sensitivity analysis method to illustrate the different lag effect on the rate of return. The calculation results show that the lag period and the agricultural scientific research income estimated values, there is no obvious relationship between, but the scientific internal revenue rate of greater impact. Djelassi (2013) selected the annual data to discuss the relationship between our country agriculture science and technology input and agricultural economic growth and farmers per capita net income [9]. The corresponding measurement model is established using SPSS empirical analysis, investment in agricultural science and technology and farmers per capita net income, agriculture, animal husbandry, fishery increased values show positive correlation. Ramanathan (2012) through the use of dummy variables to improve the co-integration relationship between variables [10], will study period is divided into from 1985 to 1995 and from 1996 to 2003 in two stages, test results show that the investment in agricultural science and technology and the total agricultural output value at each stage is co integration and Granger causality test shows that there is a two-way causal relationship between the two variables, the empirical results show that the investment in agricultural science and technology on agricultural GDP has a significant role in promoting, but agricultural GDP increase did not bring the investment of science and technology has improved significantly. Sinem (2013) the people of relevant statistical data of China from 1998 to 2003 based on the grey relational degree of mathematical analysis method [11], empirical analysis of the relationship between science and technology input and economic growth of China, and get the following conclusion: Science and technology input and economic growth has a significant correlation, in the two factors of technical staff and R & D expenditure, closer ties with the former and economic growth, contribution to economic growth is more significant.

Gebauer (2012) pointed out on the basis of analysis of China's scientific and technological progress on agricultural economic growth contribution to the situation and the main features of the, to agricultural science and technology input as independent variables [12], agricultural science and technology progress contribution rate as the dependent variable, using SPSS software metering empirical research about the investment in science and technology of agricultural scientific and technological progress contribution rate. The results showed that the agricultural scientific research input single source, the structure is not balanced, agricultural research investment intensity is far below the national level, and the contribution rate of elastic value fluctuates greatly. Liu Hong (2006) based on statistical data from 1991 to 2003 as the basis, using the improved production function, establish the multiple regression model between science and technology input and economic growth and explores empirically the correlation relationship between the two. Results show that investment in science and technology in the three years of economic growth play a role, the investment in science and technology on the contribution of China's economic growth rate was 17.1%, but

because of the lag effect, investment in science and technology to GDP growth as high as 63.9% of the contribution rate in the two-year lag period quickly end. Wei Lang (2007) based on the theoretical framework of C-D production function established corresponding econometric models, empirical analysis of the relationship between the provinces in China from 1999 to 2003 fiscal expenditure on agriculture and agricultural GDP. Results show that the corresponding output elasticity is 0.13, local finance supporting agriculture can promote agricultural economic growth; but between different types of regional effect of the elements on agricultural GDP is not the same, in the agricultural inferiority area, fiscal expenditure on agricultural GDP average contribution is about 63%, in agricultural advantage areas accounted for only 11%.

Some scholars use the relevant statistical data based on co-integration method and Granger causality analysis, make empirical research on the relationship between China's governmental public R&D expenditure and economic growth, the results show there is a long-term stable equilibrium relationship between the two, in the long run, the elasticity of public R&D expenditure on economic growth is 0.9601, has a certain role in promoting, government public R&D funds investment and economic growth exists bidirectional Granger causality. Liu Han (2008) to the relevant data from 1980 to 2006 as the basis, based on the C-D production function framework, the establishment of the corresponding multivariate econometric models, the research found that fiscal expenditure can effectively promote the growth of agricultural economy, but the financial support for agriculture composition part of agricultural economic increase length of different functions, the agricultural infrastructure spending, support the elastic coefficient of the agricultural production and agriculture, forestry and water conservancy meteorological department spending is significantly negative; the elastic coefficient of the agricultural science and technology funds is positive, but its value is not high; rural relief funds of elasticity coefficient is negative, that is, rural save economic cost increase will have a negative effect on agricultural economic growth.

3. Data Source and Statistical Analysis

In our country, the input of funds for scientific and technological activities is particularly important, from basic research to test development research, from the scientific research presented to the conversion to realistic productivity, from new product development to mass production are inseparable from the science and technology funds. From Table 1, from 1996 to 2013, sustained growth in the national science and technology funds expenditure, especially in 2000, and maintain the 59.56% growth rate, from the absolute amount of speaking, in 2008 exceeded 850 billion yuan is 9.12 in 1996. Growth rate from the point of view, in addition to the 1998 5.94 growth rate, other years were maintained ten digit above the level of growth, it can be seen that the countries since 1995 since the implementation of "revitalizing the nation through science and education" policy, the government on scientific and technological activities attention. But from the point of view of relative index, from 1996 to 2013 technology funds accounted for the proportion of GDP are below 3%. Thus, the national science and technology input intensity actually is not strong. Population average science and technology expenditures increased year by year, although the amount is not high, but can still see that our country is gradually formed a good atmosphere of advocating science and technology.

Table 1. National Science and Technology Expenditures from 1996-2013

year	R&D internal expenditure	Annual growth rate	GDP	proportion of R&D to GDP
1996	404.48	10.11	71177	0.57
1997	509.16	14.13	78972	0.64
1998	551.12	5.94	84402	0.65
1999	678.91	13.86	89677	0.76
2000	895.66	59.54	99215	0.90
2001	1042.49	12.79	109655	0.95
2002	1287.64	15.52	120333	1.07
2003	1539.63	16.85	135823	1.13
2004	1966.33	28.28	159878	1.23
2005	2449.97	20.77	183218	1.32
2006	3003.10	19.04	211924	1.39
2007	3710.24	23.30	249530	1.40
2008	4616.02	19.89	300670	1.47
2009	5802.11	25.70	340902.8	1.70
2010	7062.58	21.72	401512.8	1.76
2011	8687.01	23.00	473104.0	1.84
2012	10298.41	18.55	519470.1	1.98
2013	11846.60	15.03	568845.2	2.08

R&D activities in accordance with the types of activities, including basic research, applied research and experimental development research activities. R&D activity is the core content of the scientific research activities, which is the most innovative part. Can be seen from Table 2, China's R&D funds accounted for the proportion of GDP is still very low, the investment intensity of R&D is seriously insufficient, and needs to be further strengthened. In addition, from 2003 to 2014, China's R & D expenditure growth rate are higher than the GDP annual growth rate, which is a good development trend, according to international experience, if a country's R & D expenditure annual growth rate higher than the same period in the GDP annual growth rate, then the strength and stamina of the development of science and technology of the country can get continuously to strengthen. However, R&D funds accounted for the proportion of GDP is lower than 2%, there is a large gap with the developed countries, there is still much room for improvement.

Table 2. National R&D Expenditure Status from 2003-2014

year	Total expenditure on R&D	Growth at Constant Price	Growth at Current Price	proportion of GDP
2003	1539	16.53	19.57	1.13
2004	1966	19.46	27.71	1.23
2005	2449	19.88	15.67	1.32
2006	3003	18.11	16.97	1.39
2007	3700	14.82	22.88	1.40
2008	4616	15.41	18.15	1.47
2009	5802	26.45	8.55	1.70
2010	7062	14.10	17.78	1.75
2011	8687	14.11	17.83	1.83
2012	10298	16.40	9.69	1.98

2013	11846	20.35	15.3	2.08
2014	13015	12.41	9.9	2.05

4. Empirical Analysis

4.1 Unit Root Test

Before the general regression data, usually to stationarity test data, in order to avoid spurious regression or spurious regression phenomenon, generally by judging the validity of panel data the existence of unit root method to ensure that the estimation results. On panel data of unit root test methods are: LLC, breitung, IPS, ADF-Hsher and PP-Fisher method, in order to avoid the deviation of a single test method, can comprehensive use of above methods. By eviews6.0 software operation, the Iny, ink, inlay, INM, INH, Inr&d, respectively for unit root test, by five kinds of testing methods of the LLC, breitung, IPS, ADF-Fisher and PP-Fisher to judge whether each variable is stationary. Usually case, by Prob.** is less than the confidence degree (such as 0.05) to judge, if five test method corresponds to the p value is less than 0.05, refused to the null hypothesis of unit root exists, that the panel data is smooth, conversely, is non-stationary. If the original variable sequence through the unit root test is called variable is zero order single whole; if the variable first-order difference of sequence through the unit root test is called variables is integrated of order one.

Table 3. Unit Root Test Results

	LLCtest			Breitungtest		
	LLC statistic	Prob.**	result	Breitung statistic	Prob.**	result
lny	-15.4663	0.0000	stable	-2.17991	0.0146	stable
lnk	-14.4622	0.0000	stable	-0.85484	0.1993	unstable
lnl	-8.82263	0.0000	stable	0.79849	0.7866	unstable
lnm	-8.82522	0.0000	stable	-2.68798	0.0034	stable
lnh	-9.40231	0.0000	stable	1.18246	0.8716	unstable
Lnr&d	-9.71744	0.0000	stable	-1.19978	0.1155	unstable

4.2. Co-integration Test

Co-integration test is to test whether there is a long-term stable relationship between the variables, the premise is the explanatory variables and explanatory variables in unit root test for the same order integration. In the context of the unit root test, all variables are zero order I (0), meet the prerequisite of the co-integration test. This paper mainly by Kao test to determine whether there is long-term stable equilibrium relationship between the variables and test results in the following table:

Table 4. Panel Co-Integration Test Results

Lag	ADF statistic	Prob.	Residual variance	HAC variance
1	-6.911732	0.0000	0.005596	0.004073

According to test method to determine, P value less than 0.05, we can judge the co-integration relationship exists between the variables, and above the p value was

less than 0.01, so through the co-integration test, between the variables exist long-term stable relationship, that before the agriculture science and technology input and economic growth may be there is a long-term stable equilibrium relationship, has certain research value. Therefore, this paper on the regression equation estimated by empirical method, the regression results should be relatively accurate.

4.3. Fixed Effect Model

First, Using Stata econometric software were obtained mixture model, fixed effect model and random effect model corresponding to the regression results, as shown in the following table.

Table 5. Estimation Results of Different Model Effects

explanatory variable	hybrid model	fixed effect model	random effect model
lnk	0.0849* (3.554)	0.0711* (5.796)	0.0705 (6.007)
lnl	0.0675* (3.202)	-0.139* (-4.231)	-0.0986* (-3.304)
lnm	0.761* (16.76)	0.674* (6.785)	0.657* (11.88)
lnh	-0.299* (-5.207)	0.0962** (2.315)	00647 (1.600)
Lnr&d	0.254* (19.16)	0.190* (10.21)	0.205* (12.05)
C	7.827* (21.49)	7.974* (9.236)	7.770* (15.89)
R2:within	0.8981	0.8735	0.8629

According to the meter estimation results, in the nationwide, goodness of fit of a mixed model, fixed effect model and random effect model respectively, 89.81 and 86.38% 86.29 and according to the correlation coefficient of determination principle, the model of this paper of goodness of fit were higher has more than 85% of the explanatory power. At the same time, the explanatory variables through most of the test statistics, that explanatory variables selected in this paper is very effective and persuasive, basically do not need side in addition to variables.

According to the Hausman test shows that the judgment rule and the w statistic value of 15.84, the p value of the test method, test the corresponding probability is 0.0073, indicating that the test results clearly reject the null hypothesis of a random effects model, fixed effect model. According to the fixed effect model test, through the use of statal2 measurement software, the overall estimate of the model is shown in Table 6.

Table 6. The Estimation Results of Fixed Effects Model

	coefficient	standard deviation	T statistic	Prob. value
lnk	0.0711	0.0123	5.796	0.000
lnl	-0.139	0.0328	-4.231	0.000
lnm	0.647	0.1000	6.758	0.000
lnh	0.0962	0.0445	2.315	0.021
Lnr&d	0.190	0.0176	10.21	0.000
C	7.974	0.8633	9.236	0.000

R-sq: within = 0.8638; R-sq: between = 0.8498 ; R-sq: overall = 0.8504 F(5274) = 347.55; Prob. > F = 0.000

From Table 6 we can see group and the control group and the overall goodness of fit are 86.38%, 84.98%, 85.38%, have better fitting degree, on the whole the model still has good explanatory ability, regression estimation error is not too great. F statistic value 347.55 and under 1% of the significance levels, F value is greater than the corresponding critical value, so the model interpretation variables on the common effects of the explanatory variables are significant. The interpretation of estimated standard deviation of variables is small, the regression results with high precision. And all of the explanatory variables through the t statistic for the test, in the fixed effects change the intercept model in that each explanatory variable due to variable effects are significant and five explanatory variables have the existence value.

5. Conclusions

In this paper, we analyze the basis of national R&D investment and the present situation of its agricultural economy. With the econometric software, and carried out an empirical study on the relationship between agricultural science and technology input and agricultural GDP. In to determine the form of the model, this paper identifies the fixed effect and variable intercept model, from the point of view of the relationship between the variables and the goodness of fit was 86.38%, showing among the variables of a high degree of correlation. At the same time, the model through the F test and t test, indicates that the explanatory variables of the explanatory variables is significant, that is to say, in ten years, the agricultural input factors such as agricultural material costs, human investment, the cultivated area and the science and technology investment (including human and financial resources) and gross output value of farming, forestry, animal husbandry and fishery has a strong correlation. In addition to the stationary test, all the variables are integrated of order zero, is a stationary sequence. At the same time, panel data through the co-integration test, the agricultural capital investment and labour employment in agriculture, crop farming area, agricultural science and technology personnel and science and technology input and agricultural GDP has a long-term stable equilibrium relationship. In this paper, the study of the investment in agricultural science and technology such as the science and technology funds into the long-term elasticity of agricultural GDP is 0.19. Therefore, from a long-term point of view, funding for science and technology on agricultural economic growth plays a significant role in promoting; agricultural researchers on agricultural economic growth also has close to 0.10 elastic contribution that agricultural talent is agricultural economy long-term development of important factors.

5.1. Strengthen the R&D Investment in Agriculture

According to the results of empirical research, the funding for science and technology and agricultural science and technology personnel input have a role in stimulating and promoting the growth of agricultural economy in our country. According to the analysis of the science and technology input and agricultural economic growth of the status quo, China's agricultural science and technology input is obviously inadequate, input intensity, compared with developed countries, there is greater disparity. Therefore, it is necessary efforts in a number of ways. In science and technology investment source structure analysis in, China's science and technology funding sources are mainly government, enterprises and financial institutions, and the proportion of foreign funds and other funds rarely, the source of funding for single, in a certain extent hindered the science and

technology innovation ability of our country as a whole. But to achieve agricultural science and technology innovation, requires a large amount of capital investment, rely on government funding is insufficient. Therefore, in order to ensure the effective supply of agricultural science and technology funds, to form is dominated by the government, supplemented by other sources of supply pattern, in order to achieve China's agricultural science and technology investment diversification of the main source. To improve the investment environment of the whole society, gradually reduce the threshold of the agricultural science and technology enterprises financial loans and financing, the establishment of agricultural science and technology venture capital fund, establishment of agricultural science and technology funding mechanism for risk diversification. At the same time, take tax incentives, policy loans, financial subsidies, actively encourage different investment main body participation of agricultural science and technology research and development base, experimental development and demonstration, mobilize social resources to strengthen the support of agricultural science and technology.

5.2. Increase Agricultural Subsidies and Improve the Service System

Science and technology competition is actually the competition of talents, in order to realize the sustainable development of agricultural economy and need to strong agricultural science and technology personnel support. Due to our country present stage of agricultural science and technology personnel serious loss, personnel quality is uneven, resulting in China's agricultural research and extension institutions in trouble. Generally speaking, agricultural scientific research personnel, poor working environment, salary is low, resulting in China's agricultural technology talent shortage. Therefore, the government must pay attention to the training of agricultural scientific and technical talent, establish special agriculture science and technology funds, increase economic subsidies to the agricultural professional talent, improve their working environment and living conditions, the stability of agricultural science and technology personnel training. In addition, the establishment of scientific personnel management system, improve the service system of agricultural science and technology, clear their respective responsibilities, the implementation of classification management, the integration of industry, education and research, the establishment of reasonable talent incentive mechanism, increase investment in agricultural science and technology personnel, comprehensive use of a variety of ways to develop modern agricultural science and technology talents.

5.3. Training for Agricultural Scientists and Teachers

In addition, it is important to achieve agricultural science and technology personnel of re-education, the establishment of the government as the main body of the diversified talent investment funding mechanism, training of scientific and technical personnel. Ensure that personnel of agricultural science and technology knowledge to keep pace with the times, so as to improve the work efficiency and the level of innovation, better play extension staff promotion service level, to provide strong intellectual support and backup support for the development of agricultural economy. In the investment structure, the proportion of good basic research, applied research and experimental development, especially the basic research, the lack of sufficient financial support for science and technology, resulting in the ability of original innovation of China's agricultural science and technology is weak. Optimization of agricultural science and technology investment structure, concentrate on the basic and key agricultural research project of bundled investment, to avoid duplication of funding for science and technology cross, the limited funding for science and technology into the key areas and key links, play the maximum utility. In addition, but also make full use of the experience of the developed countries in Europe and America, by laws and regulations to ensure that investment in agricultural

science and technology support, guarantee the standardization of government investment in agricultural science and technology, from the system, a reasonable guide the behavior of government financial support, the establishment of government funds for agricultural science and technology to continue for the long-term mechanism.

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