



Research Article

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The empirical analysis of the effect of China's administrative dominant investment on the regional economic growth

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ABSTRACT

This paper finds out the role of China's government investment behavior in different economic development regions by econometric analysis, concluded that, the administrative leading factor has facilitation to the economic growth to invest in a short time in the more economically area, but an obstacle of economic development for a long time. In the low-level area it plays a positive role, with the extension of time, this effect becomes more and more unstable.

Keywords: Administrative leading invested; Regional economic growth; Pulse responds the function

INTRODUCTION

JEL CLASSIFICATION:R11

China's economic reform is top-down. Combined with the actual situation of China's system which studied on the basis of the experience of western developed market economy countries is trying to run. It is not accompanied by the economic development. Therefore, it brings problems, Governments at all levels change the rule makers into main economic behavior. System reform requires governments at all levels make use of the resources advance. It forms a unique phenomenon in China's economic development, although it is with the deepening of the reform, the behavior that government directly use executive orders to control production and business activities of enterprises is reducing. Government intervention in the economy as owners or investors, the behavior that the free-market competition is destroyed by the economic self-interest with the nature of the control means is on the rise, such as taxation, finance, land and operates concessions, etc. In other words, under the current quasi-market economy, executive-led replaced complete control of planned economy. It is our achievements of national marketization reform. However, there is a distance from the clear full market economy of the government functions.

1 MODEL AND DATA

1.1 The original data description

In this paper, the statistics reflect the three levels of executive-led investment. On the first level, we are using the capital expenditure of the financial expenditure. The second level, pick out these indicators that the operating expense, industrial, transportation, circulation department operating expense and science-education-culture-health fee and debt interest payments from the enterprise's potentialities reform capital, geological exploration, science and technology for expenses, corporate liquidity, agriculture, forestry expenditure, agriculture, forestry and water conservancy meteorological departments and so on which are choosing from the fiscal expenditure, then add up indicators, and get a dominant investment administrative on the second level. On the third level, we will use the state-owned economic investment data under a fixed investment which is according to the registration type in the statistical yearbook. To be sure, due to the lack of data, the estimate of administrative leading investment of the third level will be smaller than the actual amount of investment. For example, the state-controlled enterprises to invest in the joint stock company is not into the statistics, State-owned consortium either, meanwhile, the inventory increase of the state-owned economy is not into the statistics because of the regional data missing. All in all, in this paper, the statistics of administrative leading investment on the third level is conservative, as the data is not available. The data

used in this article is the 8 years 2002 -2009 provincial data.

1.2 Instructions on zoning

This paper studies the relationship between the administrative leading investment and regional economic growth. Therefore, it is necessary to regional division first. In this paper, making the total regional GDP in the study period as a standard, we want to see whether the relationship between economic growth and the executive-led investments have different on the economic development of different regions. By sorting the total GDP in different regions in 2002-2009, the provinces divided into three regions (in addition to municipalities): 1. Larger economy area (class I areas). It includes Guangdong, Jiangsu, Shandong, Zhejiang, Henan, Hebei, Liaoning, Sichuan, Fujian. 2. Medium economy area (class II areas). It includes Hubei, Hunan, Heilongjiang, Anhui, Guangxi, Jiangxi, Shanxi, Jilin, Shaanxi. 3. Smaller economy area (class III areas). It includes Yunnan, Inner Mongolia, Xinjiang, Guizhou, Gansu, Hainan, Ningxia, Qinghai and Tibet.

1.3 Data processing instructions

After dimensional data processing, summarize the data according to the definition of administrative leading investment. It's said that sum up the three levels of administrative leading investment together to represent the executive-led investment as defined herein. The data of provinces is then added into three region data (class I areas, class II areas, class III areas). Finally, each province's GDP index summed together according to the three regions for quantitative analysis later.

Some results of the impulse response function is failure because of the unstable data. This article refers to do the stationarity test for the processed data. Test method is ADF unit root test. First, we tested the class I region for the executive-led investment, after the EVIEWS trial, get the following results: The Second-order differential of the executive-led investment data in class I areas at least reject the unit root test of H_0 assuming at the 95% confidence level (t statistic -2.78 significantly less than 5% critical value). Class I area is relatively stable after the second-order differential. GDP data sequences of class I area is a steady data series because in the test the first order difference can smoothly through the unit root test. The administrative leading investment data of the class II area go through the unit root test after the first-order differential at the 99% confidence level at least (t statistic -9.99 significantly less than 1% critical value). After the test, the second-order differential of class II area of GDP obtained that the series could go through the ADF unit root test at the 99% confidence level. The sequence achieved the ideal of stability. The administrative leading investment data of the class III area go through the unit root test after the second-order differential difference at the 99% confidence level at least (t statistic -7.06 significantly less than 5% critical value). The t statistic in the first-order differential of class III area of GDP is less than the critical value of 99% confidence level. So the sequence presents excellent stability after the first order differential.

Table 1 Variable stationary test results

| variable | ADF test t-test value | The critical value of each significant level | | | Test results |
|------------------|-----------------------|--|-------|-------|--------------|
| | | 1% | 2% | 3% | |
| $\Delta^2 API_1$ | -2.78 | -3.36 | -2.02 | -1.65 | Steady |
| $\Delta^1 GDP_3$ | -13.95 | -7.53 | -4.93 | -3.91 | Steady |
| $\Delta^1 API_2$ | -9.99 | -7.53 | -4.93 | -3.91 | Steady |
| $\Delta^2 GDP_2$ | -7.57 | -3.36 | -2.02 | -1.65 | Steady |
| $\Delta^2 API_3$ | -7.06 | -6.76 | -4.07 | -3.21 | Steady |
| $\Delta^1 GDP_3$ | -10.42 | -7.53 | -4.93 | -3.91 | Steady |

After the stationary test and differential treatment of the time series which we want to analyze, then start the estimation of vector auto-regression model parameter. The following will introduce the model and method.

1.4 Models and Analysis Methods

Econometric model used in this paper is the VAR(Vector Auto-regression). This is a dynamic measurement method of unstructured. It is not based on a strict economy theory. Making each endogenous variable in the system as the function of the lag value of the all the endogenous variables in the system to construct model. Thus, the Univariate regression model is extended to the Vector Auto-regression which is composed by a multivariate time series variables.

This paper studies the relationship between the administration predominant investment and regional economic growth. In the model we use the API represents the administration predominant investment, gross domestic product represents by GDP. Our model is as follows:

$$GDPT=c1+a11GDPT-1+ a12APLT-1+ \varepsilon 1-t$$

$$APL_t = c_2 + \alpha_{21} GDP_{t-1} + \alpha_{22} APL_{t-1} + \varepsilon_{2-t}$$

Among them, α_{11} , α_{12} , α_{21} and α_{22} are coefficients of parameters to be estimated, c_1 and c_2 are constants to be estimated as an exogenous variable, ε_{1-t} and ε_{2-t} is immediately disturbance. After using the data to make estimates of the parameters in VAR model, we will get a model on administration predominant investment and regional economic growth. We can use the impulse response function to research and analysis on the relationship between the two variables.

Impulse Response Function (IRF) is used to measure a standard deviation of the disturbance ε impact effects on value of endogenous variable current and future, ε is also known as Innovation. If it changes, not only would change the current dependent variable, also affect the independent and dependent variables through the period of the late dependent variable. We can use the impulse response function to describe the change process.

2 ANALYSIS OF MEASUREMENT RESULTS

2.1 Analysis of VAR model parameters and pulse response function of class I area

After class I areas differential treatment, put the smooth data API and GDP input in the Eviews. Using estimate VAR function obtained the following model:

$$API = -0.7104561051 \times API_{-1} - 0.0748670824 \times GDP_{-1} + 1550.870194$$

$$GDP = 1.059404473 \times API_{-1} - 10.9365147795 \times GDP_{-1} + 13190.508982$$

Model F statistic 4.36 is greater than the critical value of F (2, 5) = 3.78 under 99% confidence level. Coefficient of determination R² and correction coefficient of determination Adj.R² are close to 1. But it is a pity that part of the t statistic is larger than the critical value. Overall, the model is more ideal.

Next, we according to the obtained model, using the impulse response function to analysis:

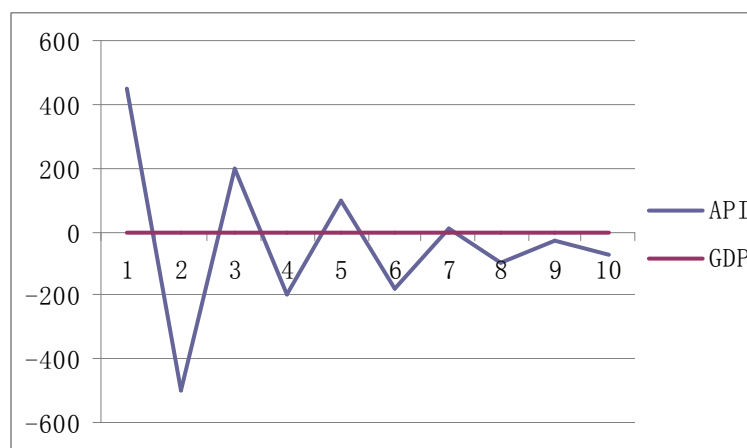


Figure 1 Response of API to One S.D. Innovations

From the figure 1 we can see, API of I class areas has no response for a standard deviation innovation from GDP. To some extent, it reflects the stability of our administration predominant investment in Class I areas between 1999 – 2006. The amount of investment is not affected by economic fluctuations. But the API is more sensitive to the impact from the performance itself, the first phase output increased more than 500 for one standard deviation shock, but the second period reduces the output of more than 500. With the time goes on, the impact is smaller and smaller. API output has stabilized. This shows that the country's eastern region has a certain influence on the API itself lagged variables. This effect in the recent time performance strongly, while the role of positive and negative fluctuations. The longer the time, influence the weaker.

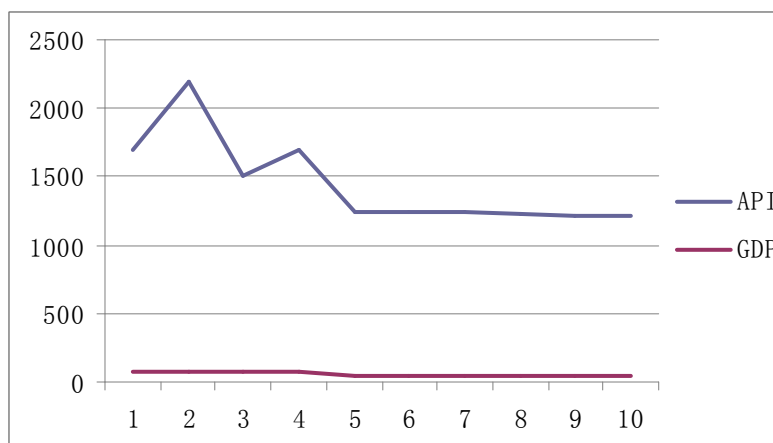


Figure2 Response of GDP to One to One S.D. Innovations

Seen from figure 2, the GDP of class I area and its own lagged variables have very weak steady relationship. That is to say, the current level of GDP output has a very small but very stable influence on the future GDP output level. It has a relationship with the formation of fixed assets of part of GDP. The GDP is particularly strong impact for the standard deviation from the API response. In the first period after impact, the output increases about 1700. Due to the time lag effect of policy at the time of the second phase of the peak at 2200, then as time goes by, the increase in output began to decay, but the attenuation not too much, even to the end of the track, the reaction of GDP is still very strong. This shows the positive impact of GDP by the country's eastern region is very large and quickly by API. The impact duration is also very long. This fully shows the API is important for class I areas' economic growth.

2.2 Class II areas VAR model and impulse response function analysis

At the same data processing method, put the data API and GDP of class II areas input in the Eviews. After performing Estimate Var arithmetic and modeling, obtain the following model:

$$API = 1.024056997 \times API_{-1} + 0.1450729757 \times GDP_{-1} + 72.69396313$$

$$GDP = -1.222481697 \times API_{-1} - 0.3502051061 \times GDP_{-1} + 2679.804882$$

Coefficient of determination R2 and correction coefficient of determination Adj.R2 of models are close to 1, it shows that the model fitting effect is good. Two equation F test value is greater than the critical value of F (2, 5) = 3.78 under 99% confidence level, but part of the t test value is less than the significant requirements. On the whole, model can well reflect the inner link between the data.

Here we use the same impulse response function analysis for class II areas:

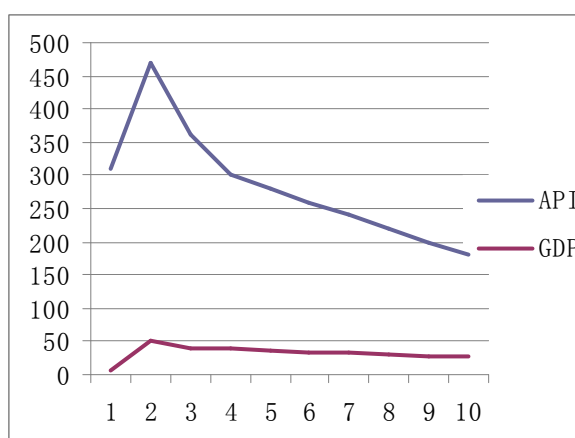


Figure3 Response of API to One S.D. Innovations

From the figure 3 we can see, class II areas API has a weak positive reaction in the second period for the impact of

standard deviation of GDP, and it appears strong positive reaction in the first period for its own impact of standard deviation and peaked in the second period. This shows that the API of class II areas has strong correlation between before and after. The current API for late API, especially the second phase of the API have a strong leading role, and the influence of regional GDP for the API is relatively weak. Compared with class I areas, we can find that, for its own innovation reaction, the API in class I areas carries on alternately positive and negative reactions, but only a positive reaction in class II areas. The API has no reaction for the innovation of GDP in Class I areas, but still has some influence in the class II areas.

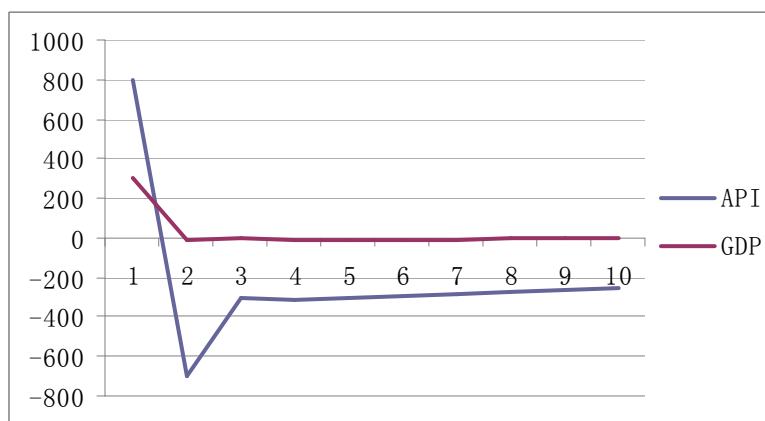


Figure4 Response of GDP to One S.D. Innovations

From the figure 4 we can see, GDP shows a very strong reaction for the impact of one standard deviation from the API, the output of GDP in the first phase has increased by nearly 900, but the benefits of the second phase becomes a strong negative benefits, and then gradually negative effects reduce over time. The GDP's reactions for the impact of itself is similar to the API, however, the extent of reaction is much smaller, and in the third period almost all the reactions have disappeared. Compared with Class I areas, the GDP in this region has a significantly different response for the API. That is, there has been a negative reaction. From the long-term benefits, API has played a negative role for local economic growth. The reaction of the GDP in the short term to its impact is different from class I areas. Class I area is basically no reaction. And this region appeared briefly output fluctuations in phase I and phase ii.

2.3 Class III areas VAR model and impulse response function analysis

VAR model calculation results of class III areas are as follows:

$$\text{API} = -0.8658097848 \times \text{API} - 10.5280882627 \times \text{GDP} - 1 + 408.9736715$$

$$\text{GDP} = 1.37195525 \times \text{API} - 1 + 0.4747314438 \times \text{GDP} - 1 + 558.011357$$

The performance of coefficient of determination R² and correction coefficient of determination Adj.R model test indicators of VAR model is not as good as the first two regions. But in general it also has reached the requirement. F statistic of the two equations have checked the critical value, F get through the test. The part of significant test is failed, indicating that some variables are not significant. In general, the estimation model gets through the test of general requirement basically.

Here we begin to analyze impulse response function:

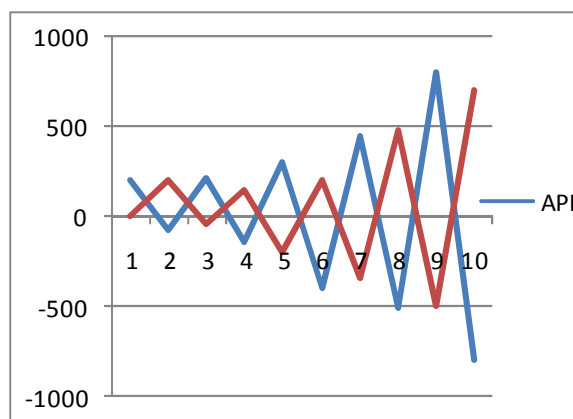


Figure5 Response of API to One S.D. Innovations

This region's API has a weak positive reaction in the first place for itself innovation impact response, but the next issue is a negative reaction, with the passage of time has been spread in the volatility of the state. API for GDP is also the same reaction in this area, the difference is only in the second period there have reaction, that is to say, the previous period GDP can have an impact on this period API, which is a part of the previous period GDP used in the current issue of the administrative leading investment, resulting the API rose.

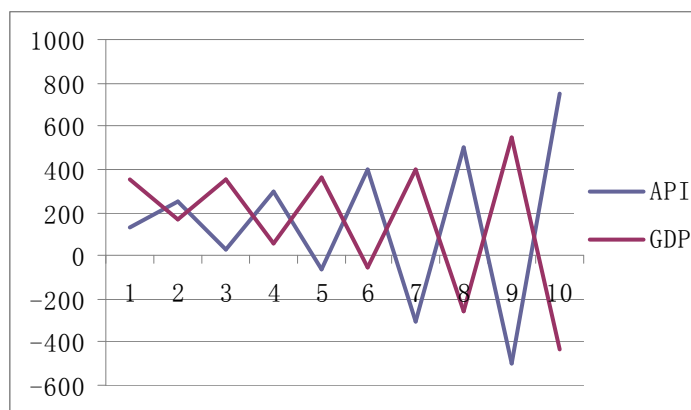


Figure6 Response of GDP to One S.D. Innovations

The region's GDP has a forward fluctuations reaction for the innovation shock from the API before 5 periods, with more and more intense fluctuations began to appear negative reaction in the odd after 5 period. The GDP's reaction for standard deviation from its own impact is similar, but a negative reaction appears in the even after the 6 period.

3 CONCLUSION AND POLICY RECOMMENDATIONS

First of all, from the reaction of the impulse response function of the three regional GDP for API can be seen, different economic development level of regional API impact on GDP is not the same. In areas with better economic development, because the system and environment is more favorable, the government has a better understanding on their own functions, making the API has a strong positive effect on the economic growth. But from the function of the image can be seen, the positive effect of peak appears in the innovation of the lag issue. Therefore, class I areas make decisions for API should fully consider the policy of short time lag. In class II areas, API has a greater positive effect on GDP in the current period, and after a very long time is a negative impact. This requires policy makers fully considering the API's role in solving the current urgent economic problems (such as the economic crisis), it can be considered to use the API force limited. But in the long run, it should start from the investment and financing system reform so that capital formation to adapt to market demand. API of class III areas is generally positive effect on GDP (the late impulse response of the negative effect is due to the problems of the quality of data), it is clear that its effect on output volatility is relatively large. This requires strengthen the management and supervision of API, to ensure it can play a catalytic role in the economic growth.

Second, from the three sets of VAR model we got can be found in class I areas and class III areas ,the API lag issue variables influence on current GDP is positive (The coefficient of API (-1) in the second equation of each group

model is positive). But API lagged variable of class II areas is negative on the current role of the GDP. Theoretically, the negative effects of administration predominant investment on economic growth is mainly crowding out, namely by raising interest rates to reduce the level of private investment and consumption, thereby reducing the growth of output. But our national interest rates is not fully market-oriented, crowding out has a unique expression form in China, which reflecting the contradictions between aggregate demand and aggregate supply led by the low efficiency of API's investment. That is to say, when a API investment enter into the economy. If the fund is expanding the total demand(investment),while it can not bring a corresponding increase in a aggregate supply due to the low efficiency. Then it will cause the contradiction between supply and demand, lead to supply shortages and inflation. The GDP price index is calculated based on the natural would be adversely affected. This is exactly what happened in this study class II areas. Therefore the corresponding policy recommendations is to reform the state-owned enterprises and construct the corresponding investment system, such as strengthening the technical and economic analysis of investment project, clear the investment decision and the assessment after the investment decision-making, promote the investment project management informationization, etc.

Finally, From the size of the API (1) coefficient in the model of the class I areas and class III areas observation, we found that the API(-1) coefficient of class III areas is 1.37195525, and the API(-1) coefficient of class I areas is 1.059404473. This shows that the role of administrative leading investment in the economy relatively backward area is greater than in the economic developed areas. This conclusion both in theory and practice are consistent. Administrative leading investment in economically backward regions are the most important source of infrastructure such as local transportation, telecommunications, energy and other infrastructure construction, while spending on education, health care and other aspects in the economically backward areas can significantly improve economic development. Starting from the above test results, we should make more administrative leading investment inclined to the economy relatively backward areas. This is not only for reasons of regional economic balance and social stability, but also a scientific choice of promoting China's overall economic growth.

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