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Analysis on the Factors Influencing the Scale Change of Fiscal Revenue in China

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Abstract:

There are many factors restricting the growth of fiscal revenue, but the most direct and subjective factor is the influence of economy. Based on the data analysis, this paper discusses the factors that should be taken into account in budgeting, that is, not only to consider the actual or additional data of GDP or other factors in this year, but also to consider the impact of factors in previous year, and to discuss the respective lag periods in detail.

Keywords: Fiscal Revenue Tax Growth Fiscal policy VAR Budget

1. Introduction

In general, the higher the tax rate, the more the government's taxes will be. But tax rates rise above a certain limit, the enterprise's management cost will increase, then lower investment and less income will continue, and government's tax will reduce in the end. The curve depicts the relationship between tax and tax rate is called the Laffer Curve.

The Laffer Curve holds that the high tax rate does not mean that the actual tax is high. The tax rate is too high, people are scared away. As a result, there are no economic activities and no taxation. Only when the tax rate reaches an optimal value, the actual tax is the highest.

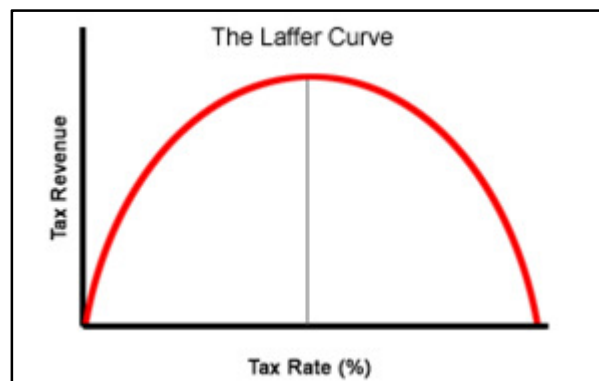


Figure 1: The Laffer Curve

The Laffer curve has an important influence on the relationship between tax burden and tax revenue or economic growth, which in theory proves that there exists the optimal combination between tax revenue and economic growth. Tax revenue is the main component of fiscal revenue, so it can be explained that in theory, the scale of fiscal revenue has an optimal state. Shaoxue Yao (2003) also confirms the objective existence of optimal financial revenue scale in his doctoral thesis. Whether the scale of fiscal revenue is the optimal state or not in every country's practice, the result depends on the comprehensive influence of the relative factors.

2. Main Factors Affecting the Change of Fiscal Revenue Scale

The changes of fiscal revenue scale are influenced by many factors, including economic factors, political factors, demographic factors, financial allocation system factors, fiscal allocation policy factors, cultural factors, etc. It should be pointed out that the changes of fiscal revenue scale in practice determined by these subjective and objective factors do not directly reflect the change rule of the optimal fiscal revenue scale. The optimal scale of the fiscal revenue can be reached at the state of efficient government. From the long-term trend perspective, economic factors play a crucial role. So, we mainly analyze the impact of economic factors, but other factors should be due consideration.

Economic factors are the basic factors that determine the scale of fiscal revenue, and also the endogenous variable factors that determine the optimal scale of fiscal revenue. As to the dialectical relation, economy and public finance are the relationship between

source and flow, root and leaf. The source is far long roots and then flourished. From the historical view, public finance doesn't appear until the development of economy and politics is enough. The financial development and change determined by economic factors is not only reflected in the content and form of financial revenue and expenditure, but also in the development and change of the scale of fiscal revenue and expenditure.

We set that economic growth refers to the sequential growth of total social output value, according to the value theory of Marx, the total value of social output in the year t can be presented as follow:

$$W_t = C_t + V_t + M_t$$

Where W represents the total value of society, C is constant capital, V is variable capital, and M is the residual value.

We consider that the production investment for the year t is I_t , and the profit margin of T-year is P

$$I_t = C_t + V_t$$

$$P = M_t / I_t$$

$$W_t = I_t + PI_t = I_t(1 + P)$$

Then we consider that the national income in year t is Y_t , F_t presents the cumulative amount and r presents the cumulative rate of T-year.

$$Y_t = V_t + M_t$$

$$r = F_t / Y_t (F_t = rY_t)$$

$$I_{t+1} = I_t + F_t = I_t + rY_t$$

$$W_{t+1} = (I_t + rY_t)(1 + P)$$

G is equal to the economic growth rate of social output value, then

$$G = (W_{t+1} / W_t) - 1 = rY_t / I_t$$

According to the income law of national income, $Y = C + S + T$ (where C represents the consumption of the residents), then $G = r(C + S + T) / I_t$. So G and r has the same direction change.

3. The Empirical Research

3.1. Data Sources and Processing

In order to set up the index system of revenue budget according to the quantifiable data analysis, this part adopts the growth rate of revenues as the target variable, other variables and data processing are listed in Table 1. The data come from the China Statistical Yearbook and the sample period is from 1978 to 2007. In order to eliminate the effect of variance, respectively, the first four variables are taken logarithm processing. The expression is basically expressed as

$$LCZSR = aLGDP + bCZZC + cLWHD + dFP + e$$

$LCZSR$ is the logarithm of the growth rate of revenue. $LGDP$ indicates the logarithm of GDP growth rate. $CZZC$ represents the growth rate of fiscal expenditure. $LWHD$ is the logarithm of the proportion of inactive population and FP presents fiscal policy.

Variable	Data processing
the growth rate of revenue	the difference between the total revenue of the T period and the total amount of fiscal revenue of the T-1 period is quantified with the proportion of the T-1 fiscal revenue
GDP growth rate	As "the growth rate of revenue"
fiscal expenditure growth rate	As "the growth rate of revenue"
The proportion of inactive population	the difference between the total population and the number of economically active population divided by the number of total population
fiscal policy ¹	China's fiscal policy may be loosely or tightly, then the value is "1" or "-1".

Table 1: Variables and data processing

3.2. ADF Test

Most time series of economic variables are non-stationary variables. Because of the existence of pseudo regression phenomenon, the result may be not true, so we should first test the unit root (ADF) of the time series variables to determine the stability of the sequence, only when it becomes a stationary sequence, regression analysis is meaningful. If the variables are not stable and the same order is complete, the cointegration test can be further carried out to determine whether there is a long-term stable relationship between the variables. The results of unit root test for the above data are as follows.

¹Note: before the middle of 1993, the fiscal policy of "loose" was implemented in China, and then the fiscal policy was "tight". Therefore, the value of fiscal policy in 1993 is defined as 0; In 2003 and 2004, China adopted the fiscal policy of partial loosening, so the coefficient is defined as -0.5

Variables	ADF Value	1%	Conclusion
LCZSR	-3.139737	-3.724070	unstable
d LCZSR	-4.854637	-3.751457	stable
LGDP	-3.227792	-3.724070	unstable
d LGDP	-4.727329	-3.711457	stable
CZC	-4.282223	-3.699871	unstable
d CZC	-5.717222	-3.711457	stable
LWHD	-1.554116	-3.689194	unstable
d LWHD	-5.376946	-3.699871	stable
FP	-3.566100	-3.689194	unstable
d FP	-6.131559	-3.724070	stable

Table 2: The result of ADF test (d is the first difference)

From the above data analysis, the first order difference of all variables is stable at 1%, which indicates that the variables are subordinate to the first order, so the cointegration relationship between variables can be further examined.

3.3. Cointegration Test

According to the cointegration theory, if two sequences satisfy the same one-order number and the cointegration relationship existing, then there is a long-term stable relationship between these two non-stationary sequences, which can effectively avoid pseudo regression.

Hypothesized No. of CE(s)	Trace Statistic	0.05 Critical Value	Prob.**
None *	135.5735	69.81889	0.0000
At most 1*	67.01738	47.85613	0.0003
At most 2	26.12909	29.79707	0.1249
At most 3	10.15161	15.49471	0.2693
At most 4	3.083897	3.841466	0.0791

Table 3: The result of Johansen cointegration test

The results show that there are 2 Cointegration equations at 5%.

3.4. The Impact Response and Variance Decomposition of VAR Model

In order to analyze the relationship between them from a dynamic perspective, we adopt the Vector autoregressive (VAR) technique which has been widely used in macroeconomic analysis. VAR technology has the advantage of no strong theoretical foundation, but it can provide the dynamic relation between the variables of interest and have strong predictive capability.

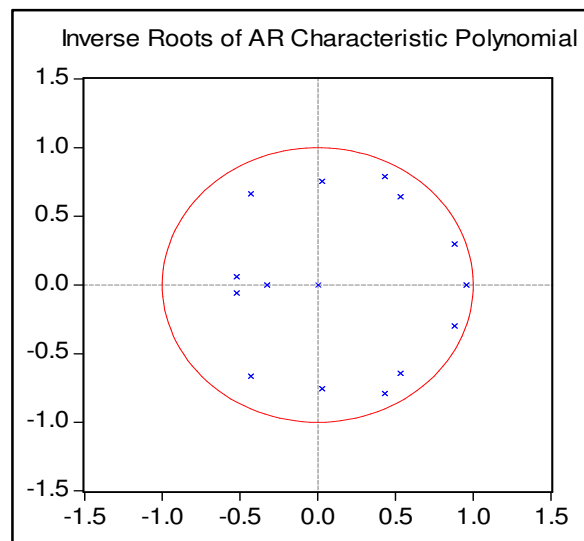


Figure 2: Inverse Roots of AR Characteristic Polynomial

It is shown from Figure 2 that the inverse of all the root modes of the Var model is less than 1, that is, in the unit circle, it is stable, and it shows that the standard error of the impulse response function that we are about to do is valid.

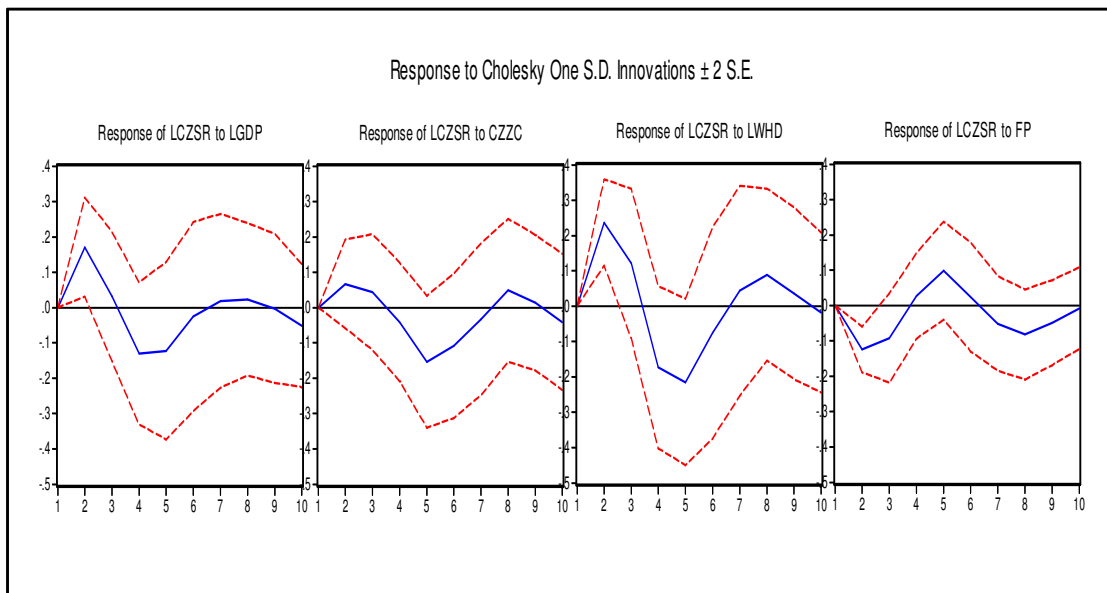


Figure 3: Response to Cholesky One S.D. Innovation

From the result of pulse response, GDP growth rate has a positive effect on revenue growth rate, and it reaches the maximum of 0.171 in the 2nd period. Then the impact gradually decreases until the negative impact. That is to say, GDP growth and fiscal revenue growth rate is not synchronized, which may be directly related to specific period of economic development, fiscal policy and tax collection and management level. In the end, the impact gradually trends to 0. The growth rate of fiscal expenditure has a negative effect on the growth rate of revenue, and it reaches the maximum of 0.154 in the 5th period. The impact of the proportion of inactive population on revenue is positive and negative, the 2nd issue is the maximum positive impact, indicating that the greater the number of inactive people, the more the financial revenue to provide them with protection; the biggest negative impact in the 5th period, that is, the more people who do not participate in economic activities, the more unfavorable to the growth of fiscal revenue, the more difficult the collection and increase. The influence of fiscal policy on the growth rate of revenue is cyclical, which is directly related to the policy cycle, and the biggest influence is in the 2nd period. Then we use Cholesky decomposition to identify these shocks.

Period	S.E.	LCZSR	LGDP	CZZC	FP	LWHD
1	0.322448	100.0000	0.000000	0.000000	0.000000	0.000000
2	0.464108	88.29836	4.609773	2.978496	3.771170	0.342204
3	0.482469	86.27259	5.190406	4.624923	3.581358	0.330726
4	0.547291	68.27202	7.740569	16.87515	4.473863	2.638399
5	0.614237	56.43615	15.48408	18.25541	5.271540	4.552831
6	0.627092	54.25851	17.80998	17.51581	5.199359	5.216332
7	0.632017	53.83338	17.64234	18.06675	5.165547	5.291976
8	0.638409	53.21269	18.52809	17.70721	5.080142	5.471864
9	0.645353	52.09911	18.39753	18.44546	5.006212	6.051693
10	0.653206	50.87600	18.01722	19.49708	4.948892	6.660804
11	0.656613	50.35089	17.99670	19.76338	4.903693	6.985337
12	0.657527	50.25924	17.96970	19.75717	4.896801	7.117089
13	0.658323	50.24080	17.92678	19.74463	4.891530	7.196267
14	0.659414	50.12652	17.87204	19.82803	4.875818	7.297587
15	0.660992	49.89561	17.84982	19.97125	4.863040	7.420278

Table 4: The result of Cholesky decomposition

Table 4 shows that the influence of the growth rate of revenue itself is relatively large, which in the long-term process towards a fixed proportion. In the short-term GDP growth rate has little effect on the growth rate of fiscal revenue, but its long-term impact is relatively large. The impact of fiscal policy on the growth rate of revenue is basically fixed, and the proportion of the economically inactive population in the short term does not contribute much, the proportion of whose impact increases in the long run.

4. Conclusion

From the above analysis, we can really understand the relationship of the growth rate between fiscal revenue and GDP since 1978. According to the analysis and calculation of Meihua Hong (2005), China's modest fiscal scale should be determined in 22%-31%,

obviously, the empirical data of these years show that the scale of our country's fiscal revenue is high, of course, this is the result of the mutual equilibrium of the multi-stakeholder group. If we want to break the inherent interest level, change the government's working concept, construct the service-oriented government, and implement the idea of people's livelihood finance, we should start with the basic budget procedure. So, we should take full account of the influence of each factor on the fiscal revenue in formulating the budget plan, and take into account the influence of the 5 periods, and make the method of budgeting scientifically.

5. References

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