

# Study on the Local Fiscal Sustainability in China from the Perspective of Equalization of Basic Public Services

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**Abstract:** The objective of equalization of basic public services makes impact on the scale and dynamic adjustment of local government fiscal expenditure to a certain degree, and affects the local fiscal sustainability. Based on the theory of intertemporal budget balance, this paper analyzes the local fiscal sustainability and dynamic adjustment in China, and analyzes the changes of local fiscal expenditure and local fiscal sustainability when simulates the condition of equalization of basic services. The results show that most regions in China can achieve fiscal sustainability and there exists dynamic adjustment of fiscal expenditure, which means that the positive fiscal policy can continue. However, if the equalization of basic public services is taken as the requirement, the dynamic adjustment of fiscal expenditure will be limited, and the fiscal sustainability of some regions will change to some extent. It is suggested to adjust the transfer payment system by taking account of the factors as the permanent population and the supply cost of basic public services.

**Keywords:** Fiscal Sustainability; Equalization of Basic Public Services; Fiscal Balance

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## Introduction

Fiscal sustainability is the core indicator to measure the ability of a country or region to fulfill its expenditure responsibilities within a certain period of time, and is closely related to the state of fiscal balance. China maintains a strict constraints of fiscal budget constraint for a long time, the Budget Law of the People's Republic of China stipulates that the budgets at all levels of governments should follow the principle of fiscal balance, and governments at all levels should establish a intertemporal budget balance mechanism. Following the strong budget constraint, local governments can achieve fiscal balance through the periods. However, as China continues to promote the equalization of basic public services, local governments need to gradually adjust the scale and structure of fiscal expenditure to meet criteria of the equalization of basic public services when formulating fiscal budget. At the same time, due to the typical centralized characteristics of China's fiscal system and the limited space for local governments to adjust fiscal revenue, equalization of basic public services will change the fiscal expenditure as well as the local fiscal sustainability.

Affected by the global economic downturn, China's fiscal revenue growth rate continues to slow down in the recent years, China has introduced a series of positive fiscal policies such as tax reduction and cut fees to play the role of counter-cyclical regulation, and stabilize the market entities and employment. As a result, the scale of fiscal expenditure has been further expanded, the contradiction between fiscal revenue and expenditure has intensified, and local governments are experiencing "tight" phenomenon of fiscal budget, the uncertainty of fiscal sustainability continues to increase. Since the expenditure on basic public services contains rigid characteristic. Promoting the equalization of basic public services means setting a certain level of rigid expenditure for local fiscal budget, which ultimately narrows the space of fiscal dynamic adjustment of local governments. In the context of the adjustment of fiscal expenditure policies by local governments based on the equalization of basic public services, the fiscal sustainability is closely related to the stable supply of basic public services, and determines the normal performance of local fiscal expenditure responsibilities and proactive fiscal policy.

Hence, analyzing the local fiscal sustainability and dynamic adjustment in China, as well as the fiscal sustainability under the

objective of equalization of basic public services is of great theoretical and practical significance for assessing the fiscal operation statuses of local governments and predicting the trend of local fiscal sustainability.

## 1. Literature review

The current research on fiscal sustainability is mainly close to the intertemporal budget constraint and the dynamic adjustment of fiscal revenue and expenditure. Blanchard (1990), Fu (2012), Fan and Arghyrou (2013), Deng and Chen (2017) analyzed fiscal sustainability from the perspective of intertemporal budget balance. Deng and Chen (2021) demonstrated that fiscal sustainability can be analyzed from several aspects, such as fiscal balance, solvency and fiscal capacity, but its essence is still reflected in the government's fiscal revenue and expenditure behavior. Liu et al. (2020) found that the fiscal sustainability of the western region of China shows a continuous wakening trend, the tax reduction will make negative impact on the local fiscal sustainability in a certain degree. Deng et al. (2021) verified that "The reform program to replace the business tax with a value-added tax" can significantly promote the fiscal sustainability of the eastern region and developed areas of the tertiary industry, but it has a significant inhibiting effect on the fiscal sustainability of the western region.

Under the intertemporal budget constraint, fiscal sustainability requires that fiscal revenue and expenditure can maintain equilibrium relationship, and there exists dynamic adjustment mechanism so that any fiscal gap deviating from the equilibrium relationship can be eliminated. Based on above theory, many scholars have researched on the fiscal dynamic adjustment. Bai and Jiang (2019) used cointegration and the error correction model to verify the existence of China's fiscal dynamic adjustment. Yang et al. (2016) used the threshold asymmetric error correction model to verify the fiscal sustainability of China, and proved the existence of self-correction mechanism of fiscal revenue and expenditure, and the velocity of dynamic adjustment enhanced when the fiscal deficit increases. Wang et al. (2015) pointed out that the fiscal dynamic adjustment in China showed signs of weakening after the Reform and Opening up, and the fiscal imbalance lasted longer, the fiscal gap also showed a trend of accelerating expansion. Li and Li (2022) hold the view that fiscal rules based on the budget balance constraint can restrict the government's expenditure and borrowing behavior, thus promoting the fiscal balance. Zhu (2017) insisted that it is difficult to make dynamic adjustment among years according to the macroeconomic situation and fiscal situation of the budget years, and the space for expenditure adjustment is also limited.

Affected by the behavior preferences of local governments, there also exists regional differences in dynamic adjustment. Lou and Chen (2018) pointed out that tax policy and fiscal expenditure adjustment are effective tools to adjust fiscal imbalances in some specific years. Xin (2021) believes that cities with low economic development level are more likely to absorb fiscal revenue through "land finance" to fill the fiscal gap. Chen (2022) found that the reduction of fiscal sustainability of local government will lead to the reduction of government's educational efforts, which is more dominant in economically developed regions.

The existing research has proved that China can maintain fiscal sustainability, and dynamic adjustment is the key factor to achieving fiscal sustainability. However, with the deepening of the equalization of basic public services, the scale of rigid expenditure of local government is expected to be further adjusted, and the fiscal sustainability of local governments is also expected to be adjusted. At the same time, the objective of equalization of basic public services strengthens the constraint of fiscal expenditure, which will limit the dynamic adjustments of fiscal expenditure to a certain extent, thus further affecting fiscal sustainability. Hence, the research about fiscal sustainability of local government can still be further propelled. Based on the existing research, this paper will comprehensively analyze the fiscal sustainability and dynamic adjustment of local governments from the perspective of equalization of basic public services.

## 2. Theoretical mechanism and research methods

### 2.1 Theoretical mechanism

Fiscal sustainability refers to the concept that government can meet the needs of fiscal expenditure including the repayment of debt and its interest, with the fiscal revenue obtained within a period, so that it can maintain the normal operation of the national machinery. Therefore, the premise of maintaining fiscal sustainability is the fiscal revenue and expenditure in line with intertemporal budget constraint, which means, fiscal revenue and expenditure are equal within a period. As the Budget Law of the People's Republic of China stipulated the intertemporal budget constraint, local government takes the intertemporal budget constraint as the principle when formulating budget, which is reflected in the public budget final statement with the absolute balance of local fiscal revenue and

expenditure<sup>2</sup>. However, this kind of balance is achieved after local governments “Live Within Its Means”. At the same time, debt income is not the government’s own fiscal revenue, instead, it’s a kind of intertemporal transfer income, which is supposed to be repaid by fiscal revenue in the future. From the perspective of soft deficit, the fiscal revenue and expenditure of local government are unbalanced when only considering local revenue, expenditure and transfer payment.

As China continues to promote the equalization of basic public services, on the one hand, the scale of local fiscal expenditure on basic public services has been adjusted accordingly, on the other hand, the objective of equalization of basic public services locks the scale of local fiscal expenditure on basic public services in a sense. As a result, the space for dynamic adjustment of local expenditure will also be reduced when facing fiscal imbalance. Hence, the equalization of basic public services will inevitably affect the local fiscal sustainability.

## 2.2 Research methods

The first step is to analyze the local fiscal sustainability and the dynamic adjustment mechanism of fiscal revenue and expenditure, and thereby whether fiscal sustainability maintained through the dynamic adjustment. The second step is to examine the fiscal sustainability of the local government in China from the perspective of equalization of basic public services.

Since the basic public service expenditure is the dominant rigid expenditure, it is much more intuitive to express the equalization level of basic public service by the scale of basic public service expenditure, while the basic public service expenditure is also more accessible.

Firstly, calculating the local fiscal expenditure on basic public services and the national per capita fiscal expenditure on basic public service. Secondly, using the national per capita fiscal expenditure as standard, and multiply by the permanent population of each provinces, thus the local fiscal expenditure on basic public services of all provinces could be calculated. Thirdly, calculating the scale which needs to be adjustment in the local fiscal expenditure and the local standard fiscal expenditure after the adjustment. Finally, using the local standard fiscal expenditure and local fiscal revenue to examine the local fiscal sustainability.

Analyzing the the fiscal sustainability based on the theory of intertemporal budget constraint, and using the cointegration to test whether the long-time equilibrium exists between local fiscal revenue and expenditure. If the local fiscal sustainability can be maintained, then using the Error Correction Model (ECM) to examine the exsistence of local fiscal dynamic adjustment, as well as the aspect of dynamic adjustment, fiscal revenue or expenditure. The cointegration and ECM is as follows:

Cointegration

$$LR_{i,t} = \alpha_i + \beta_i LG_{i,t} + u_{i,t} \quad (1)$$

$LR_{i,t}$  is local fiscal revenue including transfer payment from central government;  $LG_{i,t}$  is local fiscal expenditure.

$$LR_{i,t} = \alpha_i + \beta_i LSG_{i,t} + \delta_{i,t} \quad (2)$$

$LSG_{i,t}$  is the local standard fiscal expenditure.

Error Correction Model (ECM)

According to the aspect of fiscal adjustment, the ECM can be classified into fiscal revenue dynamic adjustment and fiscal expenditure dynamic adjustment.

Local fiscal revenue dynamic adjustment:

$$\Delta LR_{i,t} = \alpha_i \Delta LR_{i,t-j} + \beta_i \Delta LG_{i,t-j} + \gamma_i \Delta LR_{i,t-j} + \delta_i \Delta LG_{i,t-j} + \epsilon_{i,t} \quad (3)$$

Local fiscal expenditure dynamic adjustment:

$$\Delta LG_{i,t} = \alpha_i \Delta LG_{i,t-j} + \beta_i \Delta LR_{i,t-j} + \gamma_i \Delta LG_{i,t-j} + \delta_i \Delta LR_{i,t-j} + \epsilon_{i,t} \quad (4)$$

$\Delta LR_{i,t}$  is the first-order difference of fiscal revenue of each province;  $\Delta LG_{i,t}$  is the first-order difference of fiscal expenditure of each province; the error correction term  $u_{i,t-1}$  is the lag first-order of residual in equation (1); the error correction term  $\mu_{i,t}$  is the lag first-order of residual in the equation taking  $LR_{i,t}$  as independent variable while  $LG_{i,t}$  as the dependent variable.

If the coefficient of error correction term is negative, the existence of dynamic adjustment can be verified, which means that the deviation of local fiscal revenue and expenditure can be eliminated while the local fiscal revenue and expenditure can maintain a long-term equilibrium relationship.

Considering the availability of data and eliminating the impact of unexpected factors on local fiscal revenue and expenditure, this paper selects the yearly local fiscal revenue, local fiscal expenditure, the local fiscal expenditure of basic public service and the number of permanent residents at the end of the year of each province excluding Tibet and Taiwan from 1994-2019. At the same time, when examining the local fiscal sustainability, using the GDP deflator taking 1978 as the base period of each province to deflate and logarithmically transform the local fiscal revenue and expenditure. The data of local expenditure of basic public service includes expenditure on education, sports and media, health care, social security and employment, and housing guarantee. In addition, since Chongqing was founded in 1997, in order to maintain data consistency, consolidating the data of Chongqing and Sichuan province.

### 3.The empirical analysis

#### 3.1 The standardized on local fiscal expenditure of basic public service

Calculating the difference between the local expenditure on basic public service and the local standard expenditure on basic public service according to the method described above. A positive difference indicating that the local fiscal expenditure on basic public service exceeds the national average standard, while a negative difference indicating that the local fiscal expenditure on basic public service is lower than the national average standard. In order to illustrate the amount to be deducted and the relative scale of local per capita fiscal expenditure on basic public service across the country, the amount of average annual value of the deduction is showed in Figure 1.

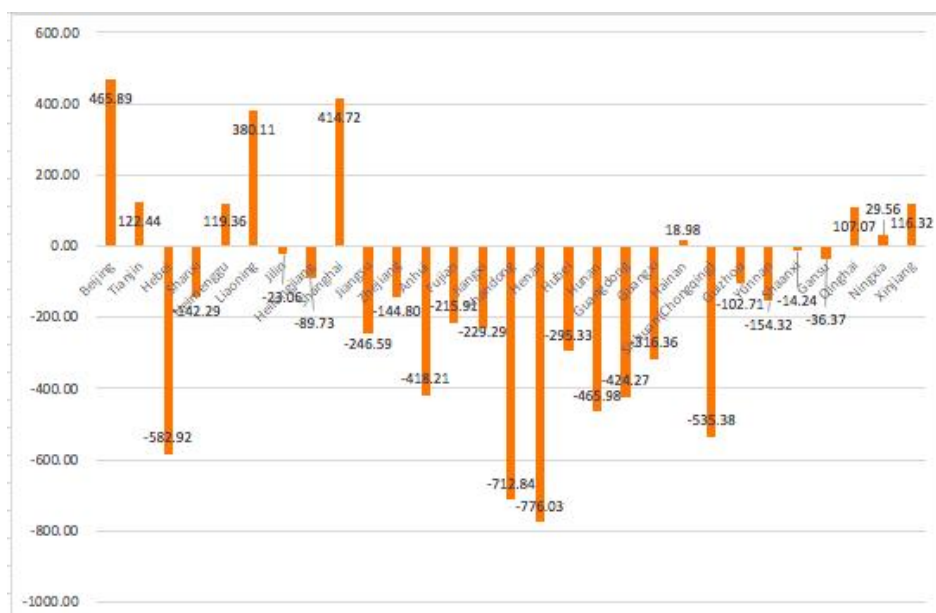


Figure 1 The average annual reduction of fiscal expenditure on basic public service in each province (1994-2019)

(Unit:100 million yuan)

According to Figure 1, the fiscal expenditure of 20 provinces are supposed to increase when local government provide the basic public service in national average standard, suggesting that fiscal deficit exists in most provinces.

Among them, the scale of fiscal expenditure in central provinces and some populous provinces are needs to increase larger than other provinces, while the fiscal expenditure in coastal developed provinces can be further reduced. In addition, due to the high supply cost of basic public service in provinces of northwest China, it is reasonable that the per capita expenditure on basic public service is higher than the national average standard, thus the scale of fiscal expenditure to be reduced is limited.

#### 3.2 The unit root test

Before cointegration, the local fiscal revenue, local fiscal expenditure, and local standard fiscal expenditure need to be examined through unit root test. The cointegration can only be carried out when the local fiscal revenue, local fiscal expenditure and local standard fiscal expenditure are the same level of integration. The result of unit root test illustrates that Jiangsu, Anhui, Henan, Guangxi, Sichuan (Chongqing) are not the same level of integration for local fiscal revenue and expenditure, while Jilin, Jiangsu, Anhui, Henan, Guangxi, Sichuan (Chongqing) are not the same level of integration for local fiscal revenue and local standard fiscal expenditure.

Therefore, the cointegration only applied to provinces other than the above provinces.

### 3.3 Cointegration test and ECM for local fiscal revenue and expenditure

#### 3.3.1 Cointegration test for local fiscal revenue and expenditure

Table 1 Cointegration test results of local fiscal revenue and expenditure

Province s	Results		Province s	Results		Province s	Results	
Beijing	$\beta$	0.996	Shanghai	$\beta$	0.985	Hainan	$\beta$	0.985
	t-value	-7.664***		t-value	-4.217***		t-value	-5.263***
Tianjin	$\beta$	0.981	Zhejiang	$\beta$	0.972	Guizhou	$\beta$	0.990
	t-value	-4.127***		t-value	-2.420**		t-value	-5.362***
Hebei	$\beta$	0.980	Fujian	$\beta$	0.957	Yunnan	$\beta$	0.981
	t-value	-3.363**		t-value	-4.428***		t-value	-7.754***
Shanxi	$\beta$	0.989	Jiangxi	$\beta$	0.959	Shaanxi	$\beta$	0.982
	t-value	-1.521		t-value	-5.188***		t-value	-5.529***
Neimen gg	$\beta$	0.987	Shandon g	$\beta$	0.983	Gansu	$\beta$	0.990
	t-value	-7.947***		T-value	-2.146**		t-value	-5.999***
Liaonin g	$\beta$	0.785	Hubei	$\beta$	0.992	Qinghai	$\beta$	0.987
	t-value	-3.107**		t-value	-3.446**		t-value	-6.054***
Jilin	$\beta$	0.974	Hunan	$\beta$	0.972	Ningxia	$\beta$	0.986
	t-value	-4.723***		t-value	-3.123**		t-value	-4.619***
Heilongj iang	$\beta$	0.979	Guangdo ng	$\beta$	0.950	Xinjiang	$\beta$	0.991
	t-value	-4.284***		t-value	-1.888		t-value	-4.319***

Note: \*\*\*, \*\*, \* indicate passing the significance level test of 1%, 5%, 10%. Only the estimated results of coefficient of the independent variable and error correction terms are listed in the table. T value is the result of unit root test of residual.

Table 1 shows the results of cointegration test of local fiscal revenue and expenditure in each province. according to the test result, except for Shanxi and Guangdong province, there is a cointegration relationship between local fiscal revenue and expenditure suggesting that most provinces can maintain fiscal sustainability. However, in all provinces, the estimated values of coefficient of independent variable are lower that 1, which means that degree of fiscal sustainability in all provinces is weak.

#### 3.3.2 ECM

Table 2 ECM Test results of local fiscal revenue and expenditure

provinces	results		province s	results		provinc es	results	
Beijing	R	0.641	Zhejiang	R	0.018	Yunnan	R	0.955***
	G	-1.428***		G	-0.631**		G	-1.086**
Tianjin	R	2.125	Fujian	R	-1.069**	Shaanx i	R	0.237
	G	-2.745**		G	-1.506***		G	-1.073**
Hebei	R	0.136	Jiangxi	R	-0.141	Gansu	R	-0.266
	G	-0.937**		G	-1.622**		G	-1.692**
Neimeng gu	R	1.910	Shandon g	R	0.122	Qingha i	R	0.473
	G	-4.080*		G	-1.148***		G	-0.621**
Liaoning	R	-4.436***	Hubei	R	0.800*	Ningxi a	R	0.456
	G	1.641		G	-1.176**		G	-1.019**

Jilin	R	0.327	Hunan	R	0.663	Xinjiang	R	0.961**
	G	-0.853**		G	-0.699**		G	-1.963**
Heilongjiang	R	0.938	Hainan	R	0.373			
	G	-2.190**		G	-1.397**			
Shanghai	R	0.509	Guizhou	R	5.031**			
	G	-1.502**		G	-5.180**			

Note: \*\*\*, \*\*, \* indicate passing the significance level test of 1%, 5%, 10%. Only the estimated value of first order difference of residuals in equation ① and ② are listed in the above table.

After the cointegration test of local fiscal revenue and expenditure in each province, the dynamic adjustment of local fiscal revenue and expenditure in each province should be examined. Table 2 is the ECM Test results of local fiscal revenue and expenditure demonstrating that all provinces carry out dynamic adjustment except for Neimeng province, which means that the deviation between local fiscal revenue and expenditure can be eliminated so that local fiscal revenue and expenditure can back to the equilibrium relationship, and maintain local fiscal sustainability. Furthermore, it can be founded that the dynamic adjustment in the vast majority of provinces coming from local fiscal expenditure, illustrating that local governments tend to adjust local fiscal expenditure to eliminating disequilibrium, which is consistent with the principle of “Determining Expenditure based on Revenue” and suggesting that local government rely on the adjustment from expenditure. Therefore, if the local fiscal expenditure on basic public service is limited, the space for local fiscal dynamic adjustment will be further compressed.

## 4. Conclusion

The vast majority of China’s provinces can maintain weak fiscal sustainability regardless of their fiscal ability. From the perspective of dynamic adjustment, China’s local fiscal revenue and expenditure basically observe of “Determining Expenditure base on Revenue ”, that is, local governments tend to adjust fiscal expenditure to maintain fiscal sustainability when facing budget imbalances. This also means that when setting an objective of equalization of basic public service, the space for local fiscal dynamic adjustment will be compressed, and maintaining fiscal sustainability requires further adjustment of the fiscal expenditure structure to keep the fiscal expenditure on basic public service relatively stable. The dynamic adjustment of fiscal expenditure is consistent with the institutional characteristics of China’s “Centralization of fiscal power to the central government and Decentralization of administrative power to the local government”, while local government owns less space for dynamic adjustment of fiscal revenue than expenditure. Therefore, if the requirements for equalization of basic public service are not considered, most provinces of China can maintain fiscal sustainability, which also means that the operation of fiscal revenue and expenditure stays in a relatively stable state, and there is still space for local governments to carry out positive fiscal policies.

After standardizing fiscal expenditures in each province using the standard of national average expenditure on basic public service, there are two changes in fiscal sustainability in each province. On the one hand, the fiscal sustainability of some provinces shift to unsustainability. On the other hand, fiscal sustainability shifts from weak to strong in provinces where per capita fiscal expenditure on basic public services exceeds the national average level, indicating that appropriate reduction in fiscal expenditure scale is conducive to enhancing local fiscal sustainability. Therefor, it is necessary for local government to adjust the scale and structure of fiscal expenditure to maintain fiscal sustainability when the equalization of basic public service is required.

Furthermore, it is founded that the per capita fiscal expenditure on basic public service in central provinces, southwest provinces and some other populous provinces is lower than the national average, which is closely related to the high density of local population.

Hence, it is suggested that provinces where per capita fiscal expenditure on basic public services exceeds the national average should adjust the structure of fiscal expenditure and expand the scale of fiscal expenditure on economic affairs in order to generate more tax source and enhance the fiscal sustainability. For the provinces where per capita fiscal expenditure on basic public services is lower than the national average, central government should expand the scale of transfer payment considering the permanent resident population to enhance fiscal sustainability.

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