

*Original Paper*

# Empirical Analysis on Influencing Factors of Financial Revenue in Sichuan Province

Mingli Gan<sup>1</sup>

<sup>1</sup> China West Normal University, Nanchong, Sichuan, 637000, China

Received: February 18, 2022

Accepted: April 12, 2022

Online Published: April 27, 2022

doi:10.22158/jepf.v8n2p68

URL: <http://dx.doi.org/10.22158/jepf.v8n2p68>

## **Abstract**

*Fiscal revenue is an important means of macroeconomic regulation and control of the country. It is the financial guarantee to perform and realize government functions. It can effectively allocate resources and income distribution, and then help the stable and healthy development of national economy. According to the relevant data of Sichuan Province from 2000 to 2020, four explanatory variables, namely fiscal expenditure, regional GDP, tax revenue and fixed asset investment, are selected to construct a multiple regression model. Using Eviews10.0, the multiple regression model is estimated, tested and corrected. The empirical results show that the change of fiscal revenue in Sichuan Province is mainly affected by tax revenue and fixed asset investment. Finally, combined with the analysis results, suggestions are put forward for the fiscal revenue growth and economic development of Sichuan Province.*

## **Keywords**

*Fiscal revenue, Tax revenue, Fixed-asset investment, Eviews*

## **1. Introduction**

With the process of reform and development, the country's economic level has improved rapidly, and the fiscal revenue has become increasingly good. As China's main macro-control means, fiscal revenue not only reflects the state of economic development, but also an important indicator to measure the financial resources of a country's government. In addition, as the economic basis for the government to perform its functions, fiscal revenue guarantees the infrastructure construction and basic public services in a region, which is related to the basic interests of the people. As an underdeveloped province in the west of China, Sichuan Province has taken the development strategy of "strong provincial capital" to make Chengdu a dominant city. In 2020, the top three cities in Sichuan Province are Chengdu CNY 177.1667 billion, Mianyang CNY 301.108 billion and Yibin CNY 282.12 billion. It can be seen that

Mianyang, the second largest city in the province, has only about a sixth of Chengdu's economy. The unbalanced development of each city has been an existing and urgent problem to be solved in Sichuan Province.

In recent years, the economic level of Sichuan Province has made great strides, and the provincial GDP has always ranked sixth in the country, while fiscal revenue is the booster of economic growth. From 2015 to 2019, the proportion of fiscal revenue in regional GDP in Sichuan Province was 11.06 %, 10.23%, 9.44%, 9.12% and 8.78%. In 2015-2019, the fiscal revenue of Sichuan Province was 33554.385 million yuan, 33888.519 million yuan, 35779.887 million yuan, 39110.92 million yuan and 40708.26 million yuan, respectively, which increased by 7.9%, 8.3%, 10.1%, 9.3% and 7.5% year on year. In 2015-2019, the national fiscal revenue increased by 8.4%, 4.5%, 7.4%, 6.2% and 3.8% year on year. Thus, Sichuan's fiscal revenue growth rate is basically higher than the national growth level. Based on how to achieve the steady growth of fiscal revenue in Sichuan Province, a multiple regression model is established on the basis of economic theory and practical significance for empirical analysis of this problem.

## **2. Model Setup**

### *2.1 Variables Selection*

#### 2.1.1 Financial Expenditure

Fiscal expenditure can stimulate economic growth, and fiscal revenue needs to rely on economic development. Maintaining fiscal balance of payments is an important condition to ensure economic stability, sustainable and rapid development.

#### 2.1.2 Regional GDP

There is a cointegration relationship between fiscal revenue and regional GDP, and the two are closely related. The larger the proportion of fiscal revenue in regional GDP is, the better the financial situation of the government is. On the contrary, the smaller the proportion of fiscal revenue in GDP, it will affect the ability of the government to perform its duties, thereby affecting the basic interests of the people.

#### 2.1.3 Tax Revenue

Rely on political rights, under the supervision of the law, mandatory, free to members of the community fixed tax, which is a reliable source of revenue. In addition, taxation affects the healthy and stable growth of finance in terms of ensuring the normal operation of the government and promoting economic growth. Therefore, in theory, the increase of tax revenue will promote the increase of fiscal revenue.

#### 2.1.4 Fixed-asset Investment

Investment is one of the three carriages that drive economic growth. The government can promote economic development through fixed asset investment, thereby driving fiscal revenue.

### *2.2 Modelling*

Sichuan province fiscal revenue  $Y$  (ten thousand yuan) is explained variable, fiscal expenditure  $X_1$  (ten

thousand yuan), GDP X2 (ten thousand yuan), tax revenue X3 (ten thousand yuan), fixed asset investment X4 (ten thousand yuan) is explained variable. Based on the above analysis to establish regression model:

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \mu$$

### 2.3 Model Estimation

The data of fiscal revenue, fiscal expenditure, regional GDP, tax revenue and fixed asset investment in Sichuan Province from 2000 to 2020 are obtained from Sichuan Statistical Yearbook. Use Eviews to get the estimated results.

**Table 1. OLS Estimation Results**

Dependent Variable: Y Method: Least Squares Date: 04/06/22 Time: 16:53 Sample: 2000 2020 Included observations: 21				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	170459.3	557306.2	0.305863	0.7637
X1	0.016258	0.080217	0.202681	0.8419
X2	-0.011326	0.016413	-0.690090	0.5000
X3	1.125650	0.116472	9.664561	0.0000
X4	0.030783	0.022139	1.390431	0.1834
R-squared	0.998263	Mean dependent var	19100717	
Adjusted R-squared	0.997828	S.D. dependent var	14632083	
S.E. of regression	681895.7	Akaike info criterion	29.90740	
Sum squared resid	7.44E+12	Schwarz criterion	30.15609	
Log likelihood	-309.0277	Hannan-Quinn criter.	29.96137	
F-statistic	2298.217	Durbin-Watson stat	1.340323	
Prob(F-statistic)	0.000000			

The estimation results of the model are as follows:

$$Y = 170459.3 + 0.016258X_1 - 0.011326X_2 + 1.125650X_3 + 0.030783X_4$$

$$t = (0.305863)(0.202681)(-0.690090)(9.664561)(1.390431)$$

$$R^2 = 0.998263 \quad F = 2298.217 \quad DW = 1.340323$$

## 3. Model Test and Correction

### 3.1 Economic Significance Test

The regression results show that fiscal expenditure is positively correlated with fiscal revenue, and fiscal revenue will increase by 0.016258 million yuan per 10000 yuan increase in fiscal expenditure. There is a negative correlation between GDP and fiscal revenue. For every CNY 10,000 increase in GDP, fiscal revenue decreases by CNY 0.0113.26 million, which is inconsistent with economic theory. The relationship between tax revenue and fiscal revenue is positive. For every CNY 10,000 increase in tax revenue, fiscal revenue will increase by CNY 1125.65 million, indicating that tax revenue is an indispensable pillar of fiscal revenue in Sichuan Province. The relationship between fixed asset

investment and fiscal revenue is positive, and the fiscal revenue will increase by 0.030783 million yuan per 10000 yuan increase in fixed asset investment.

### 3.2 Statistical Test

#### 3.2.1 Goodness-of-fit Test

The regression results show that  $R^2 = 0.998263$ , very close to 1, indicating that the model has good fitting effect on data.

#### 3.2.2 F-test

When  $\alpha = 0.05$ ,  $F = 2298.217 > F_{\alpha}(k, n - k - 1) = F_{0.05}(4, 16) = 3.01$ , and Prob (F-statistic) is close to  $0 < 0.05$ . Therefore, the null hypothesis is rejected, indicating that the total impact of the regression equation on fiscal revenue Y is significant. Fiscal expenditure X1, regional GDP X2, tax revenue X3, and fixed asset investment X4.

#### 3.2.3 t-test

When  $\alpha = 5\%$ , the degree of freedom is 16, check the t distribution table, get the critical value  $t_{0.025}(16) = 2.1199$ . Then, we can get  $|t1| = 0.202681 < t_{0.025}(16) = 2.1199$ ,  $|t2| = 0.690090 < t_{0.025}(16) = 2.1199$ ,  $|t3| = 9.664561 > t_{0.025}(16) = 2.1199$ ,  $|t4| = 1.390431 < t_{0.025}(16) = 2.1199$ . Therefore, only the impact of tax revenue X3 on fiscal revenue Y is obvious.

### 3.3 Econometrics Test

#### 3.3.1 Multicollinearity Test

Test: It can be obtained from the OLS results that the regression coefficients X1, X2 and X4 do not pass the t test, and  $R^2$  is large, and the F statistics are highly indigenous, so the established model is suspected to have multiple collinearity. The correlation coefficient is tested by Eviews. It can be seen from Table 2 that the correlation coefficients between each variable are all above 0.93. The explanatory variables are highly correlated, and there is indeed a serious multiple linear relationship.

Correction: Stepwise regression method. After stepwise regression using Eviews, the two explanatory variables X1, X2 and residual X3 and X4 are finally eliminated, and a new regression equation is obtained.

$$Y = -125358.0 + 1.120502X3 + 0.023177X4$$

**Table 2. Correlation Coefficient Matrix**

	Y	X1	X2	X3	X4
Y	1.000000	0.993274	0.988846	0.998251	0.987750
X1	0.993274	1.000000	0.996273	0.989286	0.997073
X2	0.988846	0.996273	1.000000	0.984180	0.997706
X3	0.998251	0.989286	0.984180	1.000000	0.981586
X4	0.987750	0.997073	0.997706	0.981586	1.000000

### 3.3.2 Heteroscedasticity Test

**Table 3. White Test**

Heteroskedasticity Test: White

F-statistic	5.827420	Prob. F(5,15)	0.0035
Obs*R-squared	13.86315	Prob. Chi-Square(5)	0.0165
Scaled explained SS	9.751538	Prob. Chi-Square(5)	0.0826

Test: White test. Through the test,  $nR^2 = 13.86315 > \chi_{0.05}^2(5) = 11.070$ , so there is heteroscedasticity.

Correction: WLS

Generating weight 1 sequence:  $Genr W1 = 1/abs(RESID)$

Generating weight 2 sequence:  $Genr W2 = 1/RESID^2$

White test is carried out. Weight 1 eliminates heteroscedasticity, as shown in Table 4. The modified model is:

$$Y = -83726.79 + 1.107561X3 + 0.023006X4$$

**Table 4. Results of WLS Correction**

Dependent Variable: Y  
Method: Least Squares  
Date: 04/09/22 Time: 16:50  
Sample: 2000 2020  
Included observations: 21  
Weighting series: W1  
Weight type: Inverse standard deviation (EViews default scaling)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-83726.79	39464.75	-2.121559	0.0480
X3	1.107561	0.038570	28.71581	0.0000
X4	0.023006	0.003195	7.199622	0.0000

























  

Weighted Statistics			
R-squared	0.999637	Mean dependent var	6906887.
Adjusted R-squared	0.999596	S.D. dependent var	4065524.
S.E. of regression	105868.0	Akaike info criterion	26.10934
Sum squared resid	2.02E+11	Schwarz criterion	26.25856
Log likelihood	-271.1480	Hannan-Quinn criter.	26.14172
F-statistic	24760.75	Durbin-Watson stat	1.784384
Prob(F-statistic)	0.000000	Weighted mean dep.	3843406.

### 3.3.3 Autocorrelation Test

Test: The final result after WLS correction is  $DW = 1.784384$ . When  $\alpha = 5\%$ ,  $n = 21$ ,  $k = 2$  (excluding constant terms), check the DW statistics and get  $d_l = 1.125$ ,  $d_u = 1.538$ .  $d_u < DW < 4 - d_u$  is obtained, so the model has no autocorrelation. Partial correlation test can be seen from Table 5, Partial Correlation does not have one order more than the left and right imaginary part, so the model does not exist autocorrelation.

**Table 5. Partial Correlation Test**

Autocorrelation	Partial Correlation	AC	PAC	Q-Stat	Prob
		1 0.361	0.361	3.1445	0.076
		2 -0.108	-0.274	3.4433	0.179
		3 -0.415	-0.331	8.0628	0.045
		4 -0.191	0.095	9.1009	0.059
		5 -0.137	-0.254	9.6667	0.085
		6 -0.239	-0.407	11.509	0.074
		7 -0.105	0.062	11.890	0.104
		8 0.054	-0.155	11.999	0.151
		9 0.229	-0.130	14.116	0.118
		10 0.092	-0.097	14.490	0.152
		11 -0.029	-0.192	14.531	0.205
		12 -0.021	-0.068	14.555	0.267

#### 4. Conclusion and Suggestion

After a series of tests and amendments to the theoretical model, the two influencing factors of regional GDP and fiscal expenditure are eliminated. From the optimal model, the fiscal revenue of Sichuan Province is mainly affected by tax revenue and fixed asset investment. According to the fiscal policy issued by the state and the actual economic situation of Sichuan Province, suggestions are put forward to promote the growth of fiscal revenue in Sichuan Province.

First, strengthening tax supervision to ensure the main source of income. Tax is taken from the people and applied to the people. Actively promote the importance of tax and popularize relevant laws and regulations, strengthen people's tax awareness, alert taxpayers should have legal responsibility and obligations. In recent years, the phenomenon of tax evasion has occurred frequently and the amount is huge, resulting in extremely bad social impact. The government should pay more attention to the breadth of law popularization and strengthen the crackdown, and resolutely crack down on the phenomenon of tax evasion, ensure the fairness, cleanliness and transparency of the social tax environment, so as to ensure a solid and reliable source of fiscal revenue.

Third, deepening tax reform and perfecting tax system. To achieve stable economic development, it is necessary to continuously improve the tax system to ensure the normal performance of government functions and the basic interests of people's social life. Today, the GDP of the society in the period of economic transformation has changed from high-speed development to medium-high-speed development. It is necessary to reasonably divide the scope of VAT collection according to local conditions and people. In addition, different income groups levy different tax rates, narrow the gap between rich and poor, and promote social equity and stability.

Last, optimizing industrial structure and accelerating regional economic growth. Sichuan Province should seize the strong advantages of Chengdu-Chongqing dual-city economic circle, adjust and optimize the investment structure, and ensure that investment as the main driving force promotes the

steady growth of fiscal revenue. In addition, promoting the transformation and upgrading of industrial diversification is now the Internet era, and the arrival of 5G has led technology to a higher peak. We should seize the advantages brought by science and technology to promote the transformation and development of high-tech industries. In addition, Sichuan Province has rich and valuable tourism resources, such as Jiuzhaigou, Dujiangyan, and Mount Emei. It can combine the Internet to promote the progress of tourism, promote the development of related industries, and accelerate the growth of regional economy.

### References

- Guo Lin, Guo Li, Zhang Na, & Tang Biao. (2016). Empirical Analysis on the Influencing Factors of Fiscal Revenue in China. *Modern Business Trade Industry*, 27, 135-136.
- Li Lvxiu, & Dong Xiyuan. (2021). Empirical analysis based on Eviews on China's fiscal revenue factors. *China Collective Economy*, 16, 92-94.
- Xie Liying. (2019). Empirical Analysis on the Influencing Factors of Fiscal Revenue in Anhui Province. *Modern Business Trade Industry*, 9, 115-116.
- You Jiawei. (2019). Empirical analysis of the influencing factors of China's fiscal revenue. *China Collective Economy*, 07, 100-103.
- Zhang Enquan. (2015). Empirical analysis of the influencing factors of fiscal revenue in Xinjiang. *Economic Forum*, 5, 26-30.