

Growth of Tax Revenue in Macao since the Return of 1999

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Abstract: Since the return in 1999, the tax revenue of the Macao region has proliferated due to the gaming industry, which provides a significant source of income for the government and has promoted economic development. However, the rapid decline of the Macau gaming industry in 2015 prompted a rethinking of Macao's economic development. Based on an analysis of the basic economic characteristics of Macao's tax revenue changes, the stepwise regression method was used to extract the variables influencing Macao's tax revenue. The intrinsic influence mechanism of tax revenue was deeply explored through multiple regression models. The study suggests that Macao should stabilize the gaming industry and develop diversified industries. To promote the sustainable development of Macao's economic taxation, it is suggested to take advantage of the Guangdong-Hong Kong-Macao Greater Bay Area and focus on tax integration, strengthening government regulation, and optimizing fiscal reserves.

Keywords: tax revenue; GDP; betting duty

Since its return to the motherland in 1999, Macao has opened up mainland China's free travel to Hong Kong and Macao, participated in the "Belt and Road Initiative", "Guangdong-Macao Free Trade Zone Cooperation" and the "Guangdong-Hong Kong-Macao Greater Bay Area" and other constructions, expanded foreign cooperation and moderately diversified development, and in the economy, Considerable results have been achieved in construction. Throughout the 20 years of tax data in Macao, various indicators of tax revenue have experienced cyclical fluctuations, and the disadvantages of the industrial structure dominated by the gaming industry have become prominent. Taxation, as the main source of government fiscal revenue and the main means of macroeconomic policy control, is closely related to the stable and sustainable development of a country or region's economy. At the same time, multiple factors affect the tax growth of a region. Tax growth is closely related to the region's gross regional product, comprehensive consumer price index, fiscal expenditure, and tax structure. Based on the tax data of Macao in the past 20 years since its return to the motherland, this article analyzes the characteristics of Macao's tax revenue changes, establishes a multiple regression model, and conducts classic econometric analysis to deeply explore the economic development status and existing problems of Macao, aiming to create a better future for Macao. A good tax environment in the region promotes sustainable economic development.

1. Analysis of the current situation of Macao's tax revenue growth since its return to the motherland

1. The total tax revenue has expanded and its proportion in fiscal revenue has gradually increased.

Since the return, Macao's total tax revenue has shown an overall increasing trend. During the period from 1999 to 2014, tax revenue increased from 64.83 billion patacas to 1538.64 billion patacas, an increase of 23.73 times. In 2015, the mainland economy entered a new normal, and Macau's gaming industry revenue declined, with year-on-year decreases of 31.85% and 4.55% respectively in 2015 and 2016. In 2017, Macau's tax revenue rebounded, but the total revenue was only 1174.20 billion patacas, a decrease of 364.43 billion patacas compared to 2014, but still an increase of 17.11 times compared with 1999. As the total amount of tax revenue in Macao expands, the proportion of tax revenue in fiscal revenue continues to grow. It increased from 38.26% in 1999 to 92.92% in 2017, an expansion of 2.43 times. It can be seen that the huge total scale of

Macao's tax revenue is a strong guarantee for government fiscal revenue.

2. The overall growth rate of tax revenue is higher than the GDP growth rate, showing cyclical fluctuations

We find that the trend of Macao's tax revenue growth rate and GDP growth rate from 1999 to 2017. From 1999 to 2012, both showed a positive growth trend, and the tax revenue growth rate was overall higher than the GDP growth rate. Among them, the growth rate of GDP in 2005 was higher than the growth rate of tax revenue, which was mainly affected by the signing of the CEPA (Mainland and Macao Closer Economic Partnership Arrangement) agreement in 2004. The agreement stipulates that the mainland will implement zero tariffs on 273 items of imported goods originating in Macao, which to a certain extent has weakened the source of Macao's tax revenue. However, the implementation of zero tariffs has led to more frequent economic exchanges between the mainland and Macao. Trade liberalization has stimulated Macao's economic development and overall led to an increase in tax revenue. Therefore, the growth rate of tax revenue was temporarily lower than the GDP growth rate and then gradually increased. Affected by the global financial crisis in 2009, Macao's financial industry entered a stage of low growth. Macao's real economy, which is dominated by the service industry, declined. The GDP growth rate was only 2.21%, and the tax revenue growth rate was -0.93%, which was the first time since 1999. There is negative growth. During the financial crisis, the central government actively took countermeasures to help Hong Kong and Macao overcome the difficulties. Macao also gradually expanded its opening up to the outside world and signed 5 CEPA supplementary agreements, the Guangdong Agreement, and the Trade in Services Agreement with the mainland from 2009 to 2015^①. With the full support of the mainland government, Macao's economy is gradually recovering. However, in 2015, with the transformation and upgrading of the mainland's economy, Macao's economy also entered a period of deep adjustment. On the one hand, the "Huangshan Road Run" and the "Gold Incident" brought a financial trust crisis to the Macao gaming industry. On the other hand, the mainland's anti-corruption and anti-money laundering policies, the prominent shortcomings of the VIP room system in Macao's gaming industry, and the increase in "bad debts" have led to increased operating pressure on gaming intermediaries. Macao's gaming industry revenue began to show a downward trend in June 2014 and continued to show negative growth in 2015. The Macao economy, supported by the gaming industry, has shrunk significantly, with a GDP growth rate of -18.06% and a severe decline in tax revenue, with a growth rate of -31.85%, both of which are the lowest growth rates in history.

3. The tax elasticity coefficient fluctuates greatly

The tax elasticity coefficient is an indicator in taxation that measures the relationship between taxation and the national economy. It reflects the sensitivity of taxation to economic growth. It is usually expressed by ET , where $ET = \frac{(\Delta T/T)}{(\Delta Y/Y)}$ is the ratio of the change rate of tax revenue to the change rate of GDP. Taxation comes from economic development and has a certain inhibitory effect on economic development. The economics community generally believes that ET a value of 0.8-1.2 is more reasonable. As China's tax collection and management methods continue to improve, it is generally believed that 1.0-2.0 is more reasonable^②. The overall tax revenue elasticity of Macao fluctuated greatly from 1999 to 2017. The ET value in

^① Mainland China and Hong Kong and Macao Closer Economic Partnership Arrangement (CEPA)

http://tga.mofcom.gov.cn/article/zt_cepanew/

^② Tax elasticity coefficient <https://baike.baidu.com/item/%E7%A8%8E%E6%94%B6%E5%BC%B9%E6%80%A7%E7%B3%BB%E6%95%B0/4019279?fr=aladdin>

1999 was 1.4, reaching the highest value in 2001 at 8.94. The annual *ET* values from 2000 to 2003 were all greater than 2.0, and then gradually adjusted and declined. In particular, the decrease in tax revenue in 2015 and 2016 caused *ET* the value to plummet to -115.21 in 2016, a drop of as much as 66.46%. Generally speaking, except for 2005 and 2009, the values from 1999 to 2011 *ET* are all greater than 1, that is, the growth rate of tax revenue is higher than the growth rate of GDP. From 2011 to 2014, Macao's tax revenue grew steadily, *ET* with values less than 1. It can be seen that the overall tax revenue in Macao is relatively sensitive to the level of economic development.

4. The macro tax burden level has increased with some decreases and is at a relatively reasonable level.

Macro tax burden refers to the proportion of a country's total tax revenue in gross domestic product or gross national income. It reflects the cyclicity between tax revenue growth and economic growth. There are generally three calculations: small caliber, medium caliber, and large caliber. Standard, this article uses a small-caliber calculation standard (tax revenue/GDP) to express the macro tax burden level. As can be seen from Figure 2, before 2011, the gap between the tax revenue growth rate and GDP growth rate was large. After 2011, the gap between the two gradually narrowed, and the two curves overlapped. Combined with Figure 3, Macao's macro tax burden level has increased from 12.5% in 1999 to 37.56% in 2011 since the handover and has since gradually declined to 28.94% in 2017. In 2017, the national small-scale macro tax burden level was 17.59%. The macro tax burden level in Macao was higher than the national average level, but it was relatively reasonable. It is generally believed that the surplus of material products created by economic and social development is the basis for the generation of tax revenue. Therefore, most developed regions have a higher proportion of tax revenue in GDP, while this indicator is lower in developing countries.^③

5. Mainly direct taxes, with gambling tax accounting for the largest proportion

Macao implements an independent tax system that mainly includes direct taxes. Its direct taxes mainly include gaming tax, professional tax, income supplementary tax and housing tax. Indirect taxes mainly include business tax, consumption tax, stamp duty, and motor vehicle tax. According to the nature and particularity of tax types, ignoring small taxes such as inheritance and gift tax, and property transfer tax, this article divides the main tax types in Macao into four categories, namely income tax, behavioral property tax, turnover tax, and gaming tax, of which income tax is except Income taxes other than gaming tax. As can be seen from Table 1, Macao's direct tax and indirect tax revenue have continued to grow since the return of Macao, and the gap between the two in total tax revenue has gradually widened. The ratio of direct taxes to indirect taxes reached its highest value of 31.26 times in 2010, and then the gap continued to decrease, reaching only 20.17 times in 2017. It can be seen that the proportion of indirect taxes in Macao's tax revenue has continued to increase since 2010. From the perspective of specific tax categories, the Macao gaming tax accounted for the largest proportion of tax revenue from 1999 to 2017, increasing from 73.53% in 1999 to 90.46% in 2009. After that, the proportion declined slightly, to 85.03% in 2017; At the same time, the proportion of income tax, behavioral property tax, and turnover tax showed a downward trend before 2011 and increased after 2011.

^③<https://baike.baidu.com/item/%E5%AE%8F%E8%A7%82%E7%A8%8E%E8%B4%9F/447183?fr=aladdin>

Table 1 Details of Macao's tax system from 1998 to 2017

Year	Direct Tax	Indirect Tax	Ratio of gambling tax (%)	Ratio of income tax (%)	Ratio of behavioral property tax (%)	Ratio of turnover tax (%)
1999	5.99	0.50	73.53	13.37	9.18	2.87
2000	6.90	0.53	76.02	9.77	8.38	2.78
2001	7.55	0.84	75.02	9.74	10.82	3.07
2002	8.88	0.93	76.09	7.76	9.20	2.15
2003	11.34	0.99	79.78	5.35	7.60	1.69
2004	16.12	1.30	81.02	4.78	6.95	1.36
2005	18.07	1.49	84.74	4.91	7.39	1.35
2006	21.72	1.40	82.48	5.53	5.83	1.06
2007	33.02	2.06	86.19	8.25	5.30	0.86
2008	42.99	1.88	84.74	5.55	3.29	0.50
2009	45.19	1.49	90.46	5.29	2.77	0.43
2010	68.85	2.20	88.50	4.04	2.64	0.33
2011	98.39	3.34	90.13	3.33	2.53	0.37
2012	111.96	4.96	89.27	3.37	3.32	0.42
2013	132.39	5.52	89.69	3.21	3.25	0.31
2014	136.02	5.67	88.85	4.01	3.24	0.30
2015	93.42	4.22	85.42	7.44	3.63	0.49
2016	88.46	4.08	84.30	7.53	3.91	0.45
2017	103.26	5.12	85.03	6.62	4.10	0.45

Note: The data sourced from the Statistics and Census Bureau of Macao, this table provides an overview of tax revenue in Macao from 1999 to 2017. The amounts for Direct tax and Indirect tax are expressed in billions of patacas. The professional tax and income supplementary tax are included in the income tax. The behavioral property tax combines stamp tax, house tax, and motor vehicle tax, and the turnover Tax combines consumption tax and business tax.

From the above analysis, it can be seen that since the handover, Macau's tax revenue, which is mainly composed of gaming tax, has grown rapidly. From the perspective of growth rate, tax elasticity coefficient, and macro tax burden indicators, Macao's tax revenue growth rate is faster than the GDP growth rate. The overall macro tax burden level is reasonable but the tax elasticity fluctuates greatly. The tax structure that relies heavily on gaming tax is not conducive to the long-term stable development of Macau's tax revenue. This article uses the stepwise regression method to extract the relevant variables that affect Macau's tax revenue and establishes a multiple regression model to explore the impact mechanism of each variable on Macau's tax revenue, and then provide policy suggestions for the long-term stable development of Macao's tax revenue.