Exploration of New Tax System in China: Research on Macro Tax Burden Restrained by Sustainable Development Promoting Economic Transformation and Upgrading Based on "Three Gap" Model[*]

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Abstract:

Recent years have witnessed increasingly heavy pressure for China's economy to promote the transformation and upgrading of economy. The structure of paper is as follows. First is an introduction. Second is a roundup of literature. Third is the idea of exploration of new tax system in China. Academic value, application value, object of study and innovative points are put forward to in third. The paper has shed new light on that the country's overall tax and other tax credits are determined according to the macro tax burden of the internal and external balance based on three-gap model.

Key Words: Macro Tax Burden Restrained, Frame of Fiscal Theory and Practice, Three Gap Model

1. INTRODUCTION

As Hejie ZHANG & Yaojun YANG (2016) said that macro tax burden is the central question at issue of tax policy and system. Macro tax burden is the general level of a country's tax bearing; that is, tax revenues per GDP in the same time of a country in some term. But, it is useless only using tax revenues reflects both the tax bearing of micro economic units and China's macro tax burden, because not only there are varieties of the sources of China's government income, but also they are abnormal. Thus, we should use fiscal revenues per GDP in order to indicate China's macro tax burden. There are three kinds of macro tax burdens which are small, medium and great sizes according to three definitions of fiscal revenues.

Small size fiscal revenues only include tax revenues. Medium include tax revenues and other incomes in government budget according to budget income statistics. Great include all of government's tax and nontax revenues, it not only includes government on-budget revenues, but also a great deal of various receipts not covered in the state budget from businesses and individuals. The great can comprehensively and truly reflect the macro tax burden level of the whole national economy in China.

It is an international problem to determine the reasonable range of macro tax burden. Our country tax system reform since 1994 the average growth rate of the macro tax burden is higher than the economic growth rate, macro tax burden is close to high tax burden countries from 2010 to 2016 year near 40%, see Fig. 1, but the people enjoy benefits is still in a lower level. Economic growth lacks momentum. Higher macro tax burden has severely restricted the economic transformation and upgrading. How to solve the relationship between macro tax burden and economic transformation and upgrading has become an important issue that needs to be solved by the Chinese government. In structural reform under the background of supply side to the enterprise principle of tax breaks on power, as well as the President of the United States tax trump's new booster of global wave of tax cuts, tax cuts is the President of the United States administration trump a key link of economic reform, one of which is to the enterprise income tax from 35% to 15%, the tax cut is a trillion dollars. British prime minister Theresa may also officially approved further cuts in corporate income tax rate policy, will reduce the corporate income tax rate to 17% in 2020, and promises to the corporate income tax rate will remain in the group of 20 countries in the lowest level. Xi jinping presided over the meeting of the political bureau (26th July 2016) for the first time explicitly proposing "lowering the macro tax burden", the framework of the program, the key to reducing the macro tax burden is urgently needed in China. Reducing the macro tax burden must first be based on the sustainable development of economy, keep the macro tax burden in a reasonable range, and facilitate the economic transformation and upgrading; The second is to establish a modern fiscal system, to determine the reasonable ratio of direct taxation and indirect taxation, the reasonable ratio of central tax and local taxes, and to determine the proportion of other points of taxes, eventually

to improve balance, inclusive and sustainable economic development, have important practical and theoretical significance.
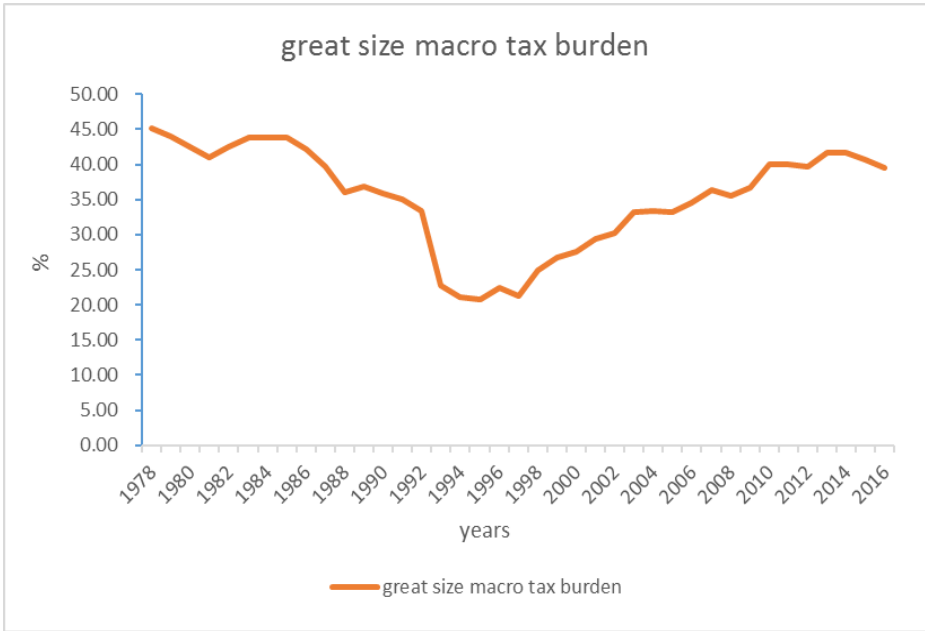

Fig.1 China's great size macro tax burden

Data sources: 2016 China statistical yearbook. Because of the 2017 China statistical yearbook no publishing, the 2016 tax revenue comes from the national general public budget statement of 2016, bureau of budget in Ministry of Finance of the People's Republic of China. Fiscal revenue, revenue from government-managed funds, insurance fund income and state capital operating budget revenue come from central and local budget implementation in 2016.

There are hundreds of definitions of sustainable development (Remigijus Ciegis, et al., 2009; UNDP, 2011; Hu Jintao, 2012; Development, 1987, 2015), Widely recognized as "the ability to meet the needs of contemporary humanity without compromising the ability of future generations to meet their own needs" (Wu JG., 2013). The "three gap" (fiscal, foreign exchange and savings gap) model provides a framework for the sustainable development of a reasonable range of macro-tax burdens. When the fiscal revenue, foreign exchange surpluses and private savings of "three gap" model to keep each other in a reasonable level, national economy will be on internal and external equilibrium, to the macro tax burden in a reasonable range, economic growth to maintain sustainable.

The structure of paper is as follows. First is an introduction. Second is a roundup of literature. Third is the idea of exploration of new tax system in China. Academic value, application value, object of study and innovative points are put forward to in third.

2. A ROUNDUP OF LITERATURE

(1) **The study of academic history and research trends abroad**. The following table shows the information of about 300 foreign languages.

Table 1. Study of academic history and research trends abroad

research topic	Core models and perspectives	Representative literature and characters
The optimal macro tax burden and economic growth analysis framework of public expenditure exogenous conditions	Chamley model, 1986	Judd, 1985; Chamley, 1986; Chari & Kehoe, 1999; Lucas, 1990; Mathieu-Bolh, 2006; Angridis, 2007; et al.
The analysis framework of the optimal macro tax, public expenditure and economic growth in the endogenous conditions of public expenditure	Barro model, 1990	Barro, 1990; Futagami et al., 1993; Greiner & Haunch, 1998; Turnovsky, 2000; Taimi, 2008; Jin, 2012
Research on the impact of savings, foreign exchange and finance on economic growth based on the "three gap" model	Bacha model, 1990	Bacha, 1990; Taylor, 1994; Zafar Iqbal et al., 2000; Ardeshir Sepehri et al., 2005; Fahd Alit et al., 2015; Jacek Pera, 2016
Tax policy and industrial upgrading	Tax policy and industrial upgrading perspective	Czarnitzki et al., 2011; Nam, 2012; Brown et al., 2012; Amore et al., 2013; Howell, 2016

Source: author set

1) As a part of the optimal taxation theory, the macro tax burden has been a hot topic in foreign scholars. There are a lot of economic history research of macro tax burden, including headed by Adam Smith's classical economics and Keynesian economics, represented by Robert Alexander mundell, laffer, Roberts of supply-side economics, represented by pigou's welfare economics, represented by alvin Hansen's new classical integrated school, Cambridge school and school, etc. From the supply school, the study of economic growth has become the most core content in the field of public economics, and its research has formed two main veins (Jin Ge, 2010). First, the optimal macro tax burden and economic growth analysis framework under the exogenous conditions of public expenditure (Judd, 1985; Chamley, 1986; Lucas, 1990; Chari & Kehoe, 1999; Mathieu-Bolh, 2006; Angridis, 2007; et al); The second is the optimal macro tax, public expenditure and economic growth analysis framework under endogenous

conditions of public expenditure (Barro, 1990; Rebelo, 1991; Pecorino, 1993; Futagami et al., 1993; Greiner & Haunch, 1998; Turnovsky, 2000; Taimi, 2008; Jin, 2012; et al).

2) Formed in the late 1980s, the "three gap" model has now become a macroeconomic internal and external equilibrium analysis of the developing countries, the mainstream of economic sustainable development problem analysis framework based on development economics (Bacha, 1990; Taylor, 1994; Zafar Iqbal et al., 2000; Ardeshir Sepehri et al., 2005; Fahd Alit et al., 2015; Jacek Pera, 2016; et al).

3) From the perspective of tax policy and industrial upgrading (Czarnitzki et al., 2011; Nam, 2012; Brown et al., 2012; Amore et al., 2013; Howell, 2016; et al).

 (2) Domestic research on academic history and research status

By more than 400 copies of the domestic literature, we found that the study of macro tax burden and economic growth, basically use foreign theories, but in accordance with China's actual of the model and parameters are modified, see Tab. 2.

1) Studying the definition and scope of macro tax burden from the perspective of China's tax practice and international comparable tax burden. Considering the macro tax burden is small, middle and great (Liu Qiusheng, 1991; An Tifu & Yue Shumin, 1999; Ma Shuanyou, 2001; An Tifu, 2002; Pang Fengxi, 2002; Zheng Zhenru, 2006; Xu Jianguo & Liu Yuan, 2009; Gao Peiyong, 2007, 2010, 2015; Yang Zhongquan, et al., 2010; Ma Haitao, 2011; Xue Gang, 2011; Wang Fengying & Zhang Limin, 2013; National development and reform commission economic research group, 2014; Yang Canming, 2016; Yao Linxiang, et al., 2016; Yang Rudai, 2016; Zhang Jie & Jin Yue, 2016).

2) According to China's actual modification model and parameter, seeking the best macro tax in China based on Barro model(1990). To seek the optimal macro tax burden in China, and to study the macro tax burden and economic growth, most believe that the macro tax burden is negatively correlated with economic growth, and there is a view that the relationship is not significant, and only fewer scholars think it is positively correlated(Ma Shuanyou, 2001; An Tifu & Lin Luning, 2002; Li Junlin, 2007; He Ying et al., 2009; Jin Ge, 2010, 2013; Yang Chengliang & Gong Liutang, 2012; Luo Handong et al., 2015; Li Weiguang et al., 2016;Yao Linxiang & Wang Zhuwang, 2016).

3) Studying the influence of fiscal and taxation policies on industrial upgrading from an industrial point of view(Chinese Academy of Fiscal Sciences Research Group of Minister of Finance of P.R.C, 2000; Ceng Zhiming, 2001; Li Wen, 2009; Li Daming & Li Bou, 2013; Wen zongyu & Zhang Xiaojie, 2009; Liu Guangfu, 2013; Zhang Bin, 2014; Chi Fulin, 2016; Li Silin, 2016). ①There are few studies on macro tax burden and economic transformation and upgrading(Zhang Tinsheng, 2013; Xong Xiaoman & Chen Guiping, 2016), some scholars study

Table 2. Domestic research on academic history and research status

research field	research perspective	Representative figures and literature
Definition and statistics of macro tax burden	Studying the definition and scope of macro tax burden from the perspective of China's tax practice and international comparable tax burden	Liu Qiusheng, 1991; An Tifu & Yue Shumin, 1999; Ma Shuanyou, 2001; An Tifu, 2002; Pang Fengxi, 2002; Zheng Zhenru, 2006; Xu Jianguo & Liu Yuan, 2009; Gao Peiyong, 2007, 2010, 2015; Yang Zhongquan et al., 2010; Ma Haitao, 2011; Xue Gang, 2011; Wang Fengying & Zhang Limin, 2013; National development and reform commission economic research group, 2014; Yang Canming, 2016; Yao Linxiang, et al., 2016; Yang Rudai, 2016; Zhang Jie & Jin Yue, 2016
Macro tax burden and economic growth	According to China's actual modification model and parameter, seeking the best macro tax in China based on Barro model(1990)	Ma Shuanyou, 2001; An Tifu & Lin Luning, 2002; Li Junlin, 2007; He Ying et al., 2009; Jin Ge, 2010, 2013; Yang Chengliang & Gong Liutang, 2012; Luo Handong et al., 2015; Li Weiguang et al., 2016; Yao Linxiang & Wang Zhuwang, 2016
Tax policy and industrial upgrading	Studying the influence of fiscal and taxation policies on industrial upgrading from an industrial point of view	Chinese Academy of Fiscal Sciences Research Group of Minister of Finance of P.R.C, 2000; Ceng Zhiming, 2001; Chen Xiaoyu, 2007; Li Wen, 2009; Wen zongyu & Zhang Xiaojie, 2009; Wen zongyu, 2010; An Ning, 2011; Bai Jianxin, 2012; Li Daming & Li Bou, 2013; Liu Guangfu, 2013; Yang Guangqing et al., 2014; Ouyang Huasheng et al., 2015; Yao Xuange, 2016; Luo Fuzheng, 2016
Fiscal, monetary and foreign trade policies	Establishing the relationship between fiscal, monetary and foreign trade policies based on a simple "three gap" model	Tang Wencan & Han Furong, 2000; Yang Ye, 2003, 2007; Cai Sifu, 2003, 2005; Wu Yunyong, 2010; Gong Haotian & Liu Wenxu, 2011

Source: author set

the relationship between macro-tax burden and regional economic transformation and upgrading from regional perspective(Wang Aihua & Wang Bi 2008; Li Xiaoyan & Xie Changqing, 2012); ②There is much literature on the promotion of industrial upgrading (Czarnitzki et al., 2011; Nam, 2012; Brown et al., 2012; Amore et al., 2013; Howell, 2016; Chinese Academy of Fiscal Sciences Research Group of Minister of Finance of P.R.C, 2000;

Ceng Zhiming, 2001; Chen Xiaoyu, 2007; Li Wen, 2009; Wen Zongyu & Zhang Xiaojie, 2009; Wen Zongyu, 2010; An ning, 2011; Bai Jianxin, 2012; Li Daming & Li Bo, 2013; Liu Guangfu, 2013; Yang Guangqing et al., 2014; Ouyang Huasheng et al., 2015; Yao Xuange, 2016; Luo fuzheng et al., 2016).

4) Establishing the relationship between fiscal, monetary and foreign trade policies using a simple "three gap" model based on fiscal, monetary and foreign exchange policies(Tang Wencan & Han Furong, 2000; Yang Ye, 2003; Cai Sifu, 2003, 2005; Wu Yunyong, 2010; Gong Haotian & Liu Wenxu, 2011).

 (3) literature review. In summary, at abroad, in the 1980s, the research theories on the relationship between optimal tax burden and economic growth have been mature, but it has hardly involved the relationship between tax burden and economic transformation and upgrading. At home, from the beginning of this century to study the relations of the optimal tax burden and economic growth, the macro tax burden and economic transformation and upgrading of literature is less, the multiple perspectives, a single industry, the non-global research situation, did not directly answer macro tax burden and economic transformation and upgrading, but is widely believed that need more financial support, tax breaks or promote industrial upgrading. "Three gap" model of common domestic research is only from the simple "three gap" model research, not from a typical "three gap" model (seven equations, a total of 22 equation of research, see Hejie Zhang, 2014), not only the lack of internal and external equilibrium perspective, more cannot be concluded that under the constraints of sustainable development of macro tax burden on the lowest and the highest thresholds values. In conclusion, there are not only No Concept of the sustainable development constraining macro tax burden and promoting economic transformation and upgrading based on the "three gap" model at abroad and at home, but also not formed a systematic theory.

3. ACADEMIC AND APPLICATION VALUE, OBJECT OF STUDY AND INNOVATIVE POINTS

(1) The unique academic and applied value of this study

1) Academic value. Model based on "three gap" perspective, deepens understanding of essential characteristics and their method logic about the sustainable development constraining macro tax burden and promoting economic transformation and upgrading. The basic concepts and basic methods for the sustainable development constraining macro tax burden and promoting the economic transformation and upgrading of economic transformation are expounded and demonstrated. It theoretically proves that it is the necessity and feasibility for the sustainable development constraining macro tax burden and promoting economic transformation and upgrading.

2) Applied value.

 i. Design has practical operability, based on the sustainable development of the "three gap" model constraining macro tax burden of reasonable interval, in order to promote the economic transformation and upgrading, and through the simulation trial and field trial test;

ii. The reasonable interval of the macro tax burden for constructing modern fiscal and taxation systems, further to determine the reasonable ratio of direct taxation and indirect taxation, the reasonable ratio of central tax and local taxes, and to determine other tax rate.

(2) Object of study

1) Based on the "three gap" model, the research on the sustainable development constraining macro tax burden. Sustainable development is the optimal allocation of resources, and the parties achieve balanced development. From the demand side (fiscal, monetary and foreign exchange policies), when the internal and external policies are balanced based on the "three-gap" model, research the reasonable range of macro tax burden as it can meet the sustainable development of economy.

2) Research on reasonable macro tax burden promoting economic transformation and upgrading.

i. Research on the mechanism of China's sustainable development of macro tax burden promoting economic transformation and upgrading;

ii. The empirical study on the macro tax burden of sustainable development in China promoting economic transformation and upgrading.

3) Study on the path of reform of the modern fiscal and taxation system which is bound to the sustainable development constraining macro tax burden and promoting economic transformation and upgrading. Starting from the supply side, when the internal and external policies are balanced based on the "three-gap" model, on the basis of meet the sustainable development of economy, after receive the total amount of the macro tax burden, its reasonable macro tax burden further how to segment? The reasonable ratio of direct tax and indirect tax? A reasonable ratio of central and local taxes? What are the specific tax items? Where is the amount of tax items to be controlled? What kinds of taxes need to be reduced? What kinds of taxes should be increased (e.g. resource tax, environmental tax, ecological rehabilitation tax, etc)?

(3) Innovative points

1) Academic thought innovation. Our research is rather different to the study of optimal macro tax burden under the framework of traditional economic growth analysis. This article embarks from the "three gap" model, under the condition of sustainable development and economic internal and external equilibrium constraints, the reasonable range of the macro tax burden from the front, and from the backend of the economic transformation and upgrading

tests reasonable interval and the feasibility of the macro tax burden, and based on this builds modern fiscal and taxation system.

Putting the "three gap" model, the internal and external equilibrium policy collocation, inclusive and sustainable and balanced economic development into the connotation of a richer analysis framework.

We are from the perspective of "three gap" model study of China's internal and external equilibrium policy collocation, since 1981, China's macroeconomic disequilibrium (the area formed by three gaps of finance, foreign exchange and saving gap) rather than decrease, but more and more big. Our simulation results show that we can reduce the huge gap in China's economic development by adjusting fiscal policies, saving policies and foreign exchange policies. But it is the first choice to adjust fiscal policy without causing too much vibration in society. In a simple way, we will reduce the macro tax burden of the present, and maintain the reasonable range of macro tax burden to meet China's economic growth and sustainable development. It needs to be pointed out that our early empirical research shows that it is not high of people's sense of gain what is the results about China's economic development. In the case of high macro tax burden, tax evasion is serious, and few small and medium-sized enterprises can survive without tax evasion. Simulation empirical studies show that when the macro tax burden reduced, along with the improvement of legal environment, increased the law-abiding consciousness of the whole society, people of the acquisition, the enthusiasm of the residents take the initiative to pay taxes, the tax revenue of the China's government is not falling, but rises. The rise of taxation increases the government's fiscal capacity, and the government's ability to regulate the macro economy is improved and a virtuous circle is formed (Hejie Zhang, 2014).

In accordance with the present situation, the modern fiscal and taxation system should be established in the consideration of underlined supply side in order to continue to consider the problem from the side of demand. After finding out the reasonable range of the macro tax, furthermore, the reasonable ratio of direct tax and indirect tax, the reasonable ratio of central and local taxes, and the reasonable ratio of local taxes are determined, and the proportion of others taxes can be determined (Hejie ZHANG & Yaojun YANG, 2016) .

2) Academic perspective innovation. This study argues that sustainable development will constrain the rapid growth of macro tax burden and promote economic transformation and upgrading, and build a modern fiscal and taxation system.

If some of the concepts in the supply theory, such as the laffer curve, were first proposed by developed countries, we have proposed the concept of supply theory with China's characteristics beyond the laffer curve. That is, based on the sustainable development of the "three gap" model constraints after the reasonable interval of macro tax burden, and determine the reasonable ratio of direct taxation and indirect taxation, central tax, and reasonable proportion of local taxes, and further to determine the tax, etc. It is systematic and profound in

thinking. And in the traditional sense of the modern fiscal and taxation systems in developed countries, even with the optimal macro tax burden, also only is linked to economic growth, does not take into account the economic sustainable development, show the unity of thought.

3) Research method innovation. In order to obtain reasonable macro-tax and build up the evaluation system of economic transformation and upgrading, we will innovate the relationship between the macro-tax burden and China's economic transformation and upgrade, and build the measurement model and the empirical study. It breaks through the traditional methods of taxation and industrial transformation and upgrading.

4) Core point. The reason for China's economic slowdown is not only the short-term impact, but the coexistence of many deep-seated problems, which cannot be solved effectively by Keynesian policies. The two sides should jointly promote long-term, steady and sound economic development. Why is the less effect of stimulating domestic demand? How to effectively reduce the imbalance in China's economic development? Our preliminary research shows that starting from the establishment of modern fiscal and taxation system is an important breakthrough. When considering the demand side (three major policies of monetary, fiscal and exchange rate), it is important to focus on the supply side to reduce the fundamental problem of unbalanced economic and internal-external imbalances -- the excessively high macroscopic tax burden.

①Based on the "three gap" model, the upper and lower limit of macro tax burden is determined.

$$s_p = \sigma_0 + \sigma_1 u, \quad \sigma_0 > 0 \text{ or } \sigma_0 < 0, \quad 0 < \sigma_1 < 1$$

Private savings (s_p) are defined in equation and are specified in a standard way, according to which savings are assumed to vary positively with the capacity utilization variable (u). The parameter σ_0 in equation implicitly includes private foreign interest payments. The marginal saving rate σ_1 implicitly includes the effects of taxes transfers. $0 < \sigma_1 < 1$, It shows that in normal society, the development of production must increase private saving. If private savings is not increased, the government's macro tax burden is too high, lead to private spending must consume the accumulation, suggests that the current tax system has been unable to effectively promote the development of economy, economic growth momentum is insufficient, lack of sustainability.

②We will further clarify the upper and lower limits of the macro tax burden in the macroeconomic and external equilibrium. In the macro-economic and external equilibrium, the three-gap model interacts with each other. The savings gap (g_s) is equal to the fiscal gap (g_i) equal to the foreign exchange gap (g_f) equal to the economic growth rate (g). That is, $g_s = g_i = g_f = g$. To check whether the macro tax burden meets the requirements of macroeconomic equilibrium.

Saving gap (g_s) $$g_s = k[\sigma_0 + z_0 - \zeta j^* + \Phi] + k(z_1 + \sigma_1) u + g_0$$

Foreign gap (g_f)	$g_f = \frac{k}{1-\theta}(\xi_1 - a_1)u + \frac{k}{1-\theta}(\Phi + \xi_0 - j^* - a_0 - m) + g_0$
Fiscal gap (g_i)	$g_i = k(1+\alpha)(z_0 - \zeta j^*) + k[(1+\alpha)(\pi + z_1) + \beta]u + g_0 + ki_0$
Growth-investment	$i_g = \frac{1}{1+\alpha}[\frac{\overline{g} - g_0}{k} - (i_0 + \beta u)]$

The parameter (k) denotes the incremental capital output ratio (ICOR). z_1 is the marginal fiscal effort rate. In addition to the rate of capacity utilization, the fiscal effort rate is influenced by other factors such as size of the tax base and the effectiveness of tax collection system. The strength of these other factors is captured by the parameter (z_o). j^* denotes interest payments on foreign and domestic debts. ζ is the share of government. Ø is total capital inflows as a percentage of potential output. u is capacity utilization. g_o denotes other factors affecting the rate of growth of output, such as labor productivity growth. m is goods imports. i_g is government investment. $\overline{g}$ is the rate of growth of potential output. All of $\theta, a_0, a_1, \xi_0, \xi_1, \alpha, \beta, i_0$ are parameters, and $0<\theta<1$, $a_0>0$ or $a_0<0$, $0<a_1<1$, $\xi_0>0$ or $\xi_0<0$, $0<\xi_1>1$, $\alpha>0$ or $\alpha<0$, $\beta>0$.

③The country's overall tax and other tax credits are determined according to the macro tax burden of the internal and external balance. Firstly, we can get the macro tax burden, that is the overall tax amount in China, according to the value, $g_s=g_i=g_f=g$. Secondly, other tax credits are determined according to the overall tax amount in China.

In short. Using the "three-gap" model gives the concept of sustainable development of restriction on top and bottom limitation of macro tax burden, to promote the transformation and upgrading of economy, improve balance, inclusive and sustainable economic development, build modern fiscal and taxation systems with China's characteristics.

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