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Analysis on the Steady Growth Effect of China's Fiscal Policy from a Dynamic Perspective

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Abstract: Under the goal of a "new development pattern", it is of great practical significance to accurately identify the economic growth effect of fiscal and tax policies. This paper constructs a TVP-FAVAR model to measure the economic effects of China's fiscal and tax policies at the aggregate and structural levels. The results show that the reduction in total tax has a positive effect on real variables such as output and consumption; especially at the present stage, the promotion effect of total tax reduction on economic growth is relatively strong, but the stimulation effect on price is relatively weak. Further, the tax structure in which the ratio of direct tax to total tax increases and the ratio of indirect tax to total tax decreases is more conducive to the increase in output and consumption, and will not strongly stimulate the rise of price level. Therefore, at this stage, China should continue to vigorously implement the tax reduction policy and ensure the continuity of the tax reduction policy. At the same time, we should continue to optimize the tax structure and give better play to the regulatory role of fiscal and tax policies in income redistribution, so as to achieve the goal that fiscal and tax policies help build a "new development pattern" and promote high-quality economic development.

Keywords: sustainable growth; fiscal policy; nonlinear correlation

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1. Introduction

The proposal of the Central Committee of the Communist Party of China on formulating the 14th five-year plan for national economic and social development and the long-term goal of 2035 clearly puts forward that it is necessary to "accelerate the construction of a new development pattern dominated by the domestic cycle and mutually promoted by the domestic and international cycles", and urges the academic circles to vigorously carry out the research on the "new development pattern". When studying the "new development pattern", we should first understand why China should put forward a new development strategy at this stage. In fact, before the reform and opening-up, China developed its economy under the strategic guidance of "self-sufficiency", which belongs to a typical internal circular economy. Since the reform and opening-up, especially after China's successful accession to the WTO, China's economy has been more and more deeply involved in the international economic cycle, and gradually formed a production pattern of "two ends out" and "big in and big out". However, with the outbreak of the U.S. financial crisis, the intensification of economic and trade frictions between China and the U.S., the COVID-19 pandemic sweeping the world and other adverse factors, China's traditional export-oriented economic development mode has been injected with great risk and uncertainty. After the outbreak, Western countries are bound to strengthen the protection of their own markets due to factors such as the stability of their own industrial chain and curbing China's development, which will lead to the prevalence of protectionism and nationalism all over the world. China's export situation may be further frustrated in the future. In

addition, China's per capita GDP has exceeded 10,000 US dollars, which is classified by the world bank as a medium- and high-income country. As a middle- and high-income country with a large population, the economic development mode should not rely heavily on export orientation, but should focus more on the domestic market development. Therefore, the central government sized up the situation and put forward the strategy of accelerating the construction of a "new development pattern".

However, the "new development pattern" does not mean returning to the old road of "self-sufficiency" and closing the country, but places more emphasis on the domestic market, guiding enterprises to reduce their excessive dependence on the international market, and building a healthy and sustainable development path. As General Secretary Xi Jinping pointed out at the Entrepreneurs Symposium, "With the domestic cycle as the main body, it is by no means closed doors and closed operations, but by leveraging the potential of domestic demand, the domestic market and the international market can be better connected and better utilized. Two domestic and international markets and two resources to achieve stronger and sustainable development." The key to forming a development pattern with internal circulation as the main body is to give full play to the advantages of the domestic super-large market and stimulate the huge domestic demand potential. Traditional domestic demand includes investment and consumption. At this stage, under the background of increasing financial pressure and maintaining a stable monetary policy, it is unsustainable to rely on expanding infrastructure investment to drive economic growth. The 2020 Politburo meeting proposed, for the first time, to focus on "demand-side reforms", with the primary goal of expanding residents' consumption and "opening up congestion points". As the government's main tool for economic regulation and control—fiscal and taxation policies—understanding what kind of fiscal and taxation tools and policy coordination are needed under the "new development pattern", in addition to understanding what the future reform directions of fiscal and taxation policies are. This paper attempts to make a preliminary analysis of the above problems in order to provide a policy reference for accelerating the reform of fiscal and taxation policies under the goal of building a "new development pattern".

The impact of fiscal policy on macroeconomy is an important research content of economic growth theory and macro public finance theory, and rich research results have emerged. With the development of macro public finance theory, it has further stimulated the development of relevant literature to measure the impact of fiscal and tax policies on macroeconomy from the empirical level. One of the important research directions is to investigate the macro impact of fiscal and tax policies on economic growth, consumption and so on based on the demand side. The impact of fiscal and tax policies on macroeconomy largely depends on the fiscal and tax structure. Generally, the macro public finance and taxation theory holds that the greater the proportion of direct tax and the smaller the proportion of indirect tax in the fiscal and taxation structure, the greater the incentive effect on consumption [1–5]. The reason is that from the perspective of fiscal revenue structure, the indirect tax is ultimately the tax burden borne by the buyers of goods and services, while the taxpayers of direct tax are the tax bearers themselves, so there is no problem of tax burden transfer or transfer. The greater the proportion of direct tax, the more direct the regulatory role of fiscal policy in residents' income distribution, and the more equal the distribution of income among residents, which helps to adjust the overall consumption level of residents. On the contrary, it is the opposite.

It should be noted that the empirical study found that the above tax structure does not always have a positive impact on output and consumption, and the research conclusions are quite different due to different assumptions of the empirical model. For example, Yan and Gong [6] analyzed the impact of direct tax and indirect tax on economic growth based on the data of 31 provinces in China from 1995 to 2007. The research conclusion shows that the proportion of direct tax has no significant impact on economic growth. Liu and Luo [7] discussed the impact of levying wage tax on consumers (direct tax) and output tax on enterprises (indirect tax) on economic growth and social welfare under the framework

of the two generations overlapping model. The research conclusion shows that in order to maximize output and capital stock, the optimal tax rate structure should be levying tax on enterprises. Arnold et al. [8] analyzed the macroeconomic effects of tax structure changes under the dual objectives of accelerating economic recovery in the crisis and contributing to long-term growth. The empirical results believe that by gradually shifting the tax base to consumption and real estate, economic growth can be promoted, while reducing income tax is not conducive to economic recovery because short-term recovery needs to increase demand, while long-term growth needs to increase supply. Benzarti and Carloni [9] used micro level data to evaluate the impact of the French VAT reduction on different economic entities such as workers, business owners, consumers and suppliers. The study found that the VAT reduction had the most positive effect on business owners, but the benefits of consumers were limited. Carlos and Nelson [10] used Brazilian data to study the economic effects of changes in tax structure and found that increasing consumption tax had a positive impact on output, capital and consumption. Balatsky and Ekimova [11] put forward the "turnpike hypothesis" and constructed the measurement relationship between three indirect taxes (value-added tax, tariff and consumption tax) and economic system participants (countries, producers and consumers). The study found that the increase in Russia's value-added tax rate reduced the activities of the three participants in the economic system, while the increase in consumption tax or tariff enhanced their activities.

Exploring what factors promote sustained economic growth has always been the focus of theoretical and practical workers. Through the literature review, the empirical evidence can be summarized as follows: First, emphasize the positive role of human and material capital investment in sustained economic growth [12–19]. At the same time, some studies also show that R & D and innovation are also important factors to promote economic growth [20–24]. Second, the economic growth accounting results of classical literature show that consumption and foreign trade play an important role in economic growth [25–30]. Third, the improvement in economic structure promotes economic growth [31–35]. It is worth noting that few existing studies measure the economic growth effect of tax policy through quantitative analysis [36–38], especially to investigate the economic growth effect of fiscal and tax policy changes on the demand side under the goal of a "new development pattern" at this stage. In fact, measuring the economic growth effect of tax policy through empirical analysis is conducive to better investigate the macro impact of tax on China's economy. Therefore, this paper studies the dynamic impact effect of total tax and the tax structure change on macroeconomy by constructing the TVP-FAVAR model in order to provide empirical reference for accurately grasping the pulse of fiscal and tax policy reform.

Compared with the existing literature, our marginal contribution may be reflected in the following two aspects: On the one hand, this paper uses the variable coefficient model to investigate the economic growth effect of fiscal and tax policies. In reality, economic development has obvious cyclical characteristics. When investigating the sample data with large span in the constant coefficient measurement model, it is easy to ignore the time variability of the internal correlation mechanism of the economic system in different cycle stages, which leads to the lack of pertinence of the research conclusions. In addition, conventional econometric models usually contain a small number of economic variables, which is easy to lose the rich information provided by economic data in empirical analysis, resulting in low efficiency of data information mining. The TVP-FAVAR model can effectively overcome the above shortcomings. On the other hand, under the goal of accelerating the construction of a new development pattern dominated by the domestic big cycle, we should fully investigate the demand-side economic growth effect of the change of total tax and tax structure. The existing literature focuses more on the long-term economic growth from the perspectives of capital, innovation and technological progress. The research on the growth effect of fiscal policy focuses more on the level of fiscal expenditure, while the research on the fiscal effect of tax and its structure is relatively few. In view of this, this paper attempts to make a preliminary discussion on the economic growth effect of tax policy at the present stage within the framework of the variable coefficient econometric model.

The paper is organized as follows: Section 2 introduces the main methods. Section 3 introduces the data and summarizes the main empirical results. Section 4 presents relevant conclusions and policy recommendations based on this study.

2. Materials and Methods

As an important starting point for the government to regulate the macroeconomy, the function mechanism of fiscal policy not only affects the output and price at the macro level, but also affects the family and enterprise decision-making at the micro level. The classical linear vector autoregressive model and nonlinear vector autoregressive model (such as T-VAR, ST-VAR, TVP-VAR) contain a small number of endogenous variables, resulting in a failure to make full use of the economic information provided by many real data, and failure to accurately identify the impact effect of fiscal policy. In view of this, this paper uses the TVP-FAVAR model to complete the quantitative measurement of the economic growth effect of China's fiscal and tax policies.

Before introducing the TVP-FAVAR model, the following simplified classical vector autoregressive model is introduced:

$$y_t = b_1 y_{t-1} + b_2 y_{t-2} + \cdots + b_p y_{t-p} + \varepsilon_t \tag{1}$$

In Equation (1), $y'_t = [x'_t, z'_t]$, x_t is an $(l \times 1)$ economic variable matrix reflecting the main characteristics of the economy (such as output, price, consumption, interest rate), z_t represents the policy variables that the government can control (such as government taxes and expenditures in fiscal policy), b_i, $i = 1, \cdots, p$ is the $(l+1) \times (l+1)$ regression coefficient matrix of the lag variable y_{t-i} to the explained variable y_t, $\varepsilon_t \sim N(0, \Omega)$ is the disturbance column vector, and Ω is a $(l+1) \times (l+1)$ dimensional covariance matrix.

The classical linear vector autoregressive model represented by Equation (1) generally contains no more than 5 endogenous variables. If more variables are introduced into the model, the problem of "curse of dimension" will appear immediately. However, in the real economy, the government needs to monitor many indicators reflecting the state of economic operation. If we want to capture the regulation effect brought by a policy change as much as possible, we need to design an econometric model that can contain as many economic variables as possible. A popular method is to decompose the high-dimensional variable matrix x_t into the low-dimensional variable matrix f_t, where the dimension of f_t is much smaller than that of x_t. At this time, the constructed model is the FAVAR model. In addition, in the real environment, there is a general nonlinear relationship between economic variables. In order to accurately describe the nonlinear influence mechanism, it is necessary to allow the parameters to be time-varying based on the FAVAR model; thus, the TVP-FAVAR model in the following form is obtained:

$$y_t = b_{1t} y_{t-1} + b_{2t} y_{t-2} + \cdots + b_{pt} y_{t-p} + \varepsilon_t \tag{2}$$

In Equation (2) $y'_t = [f'_t, z'_t]$, f'_t represents the $(k \times 1)$ dimensional factor variable matrix extracted based on many variable matrices x'_t, z_t represents the policy variables that the government can control, b_i, $i = 1, \cdots, p$ is the $m \times m$ regression coefficient matrix of the lag variable y_{t-i} to the explained variable y_t, $m = k+1$, $\varepsilon_t \sim N(0, \Omega_t)$ is the disturbance column vector, and Ω_t is a $m \times m$ dimensional covariance matrix.

In addition, for each observation variable in the variable matrix x'_t, factor regression analysis is conducted for factor variable f'_t and government regulation variable z'_t, and the form of variance is set as autocorrelation and random fluctuation. The specific regression equation is as follows:

$$\begin{cases} x_{it} = \widetilde{\lambda}_i^f f_t + \widetilde{\lambda}_i^z z_t + \eta_{it} \\ \eta_{it} = \rho_{i1} \eta_{it-1} + \cdots + \rho_{iq} \eta_{it-q} + \delta_{it} \end{cases} \tag{3}$$

In Equation (3), $\widetilde{\lambda}_i^f$ represents the $(1 \times k)$ dimensional coefficient matrix, $\widetilde{\lambda}_i^z$ represents the (1×1) dimensional coefficient matrix, and $\delta_{it} \sim N(0, \exp(h_{it}))$. At the same time, assuming that δ_{it} is non autocorrelated with factor variable f_t and its own lag, Equation (3) can be transformed into the following simple form:

$$x_t = \lambda^f f_t + \lambda^z z_t + \Gamma(L) x_t + \mu_t \tag{4}$$

In Equation (4), $\Gamma(L) = diag\left(\rho^1(L), \cdots, \rho^n(L)\right)$, $\rho^i(L) = \rho_{i1}L + \cdots + \rho_{iq}L^q$, $\lambda^j = (I_n - \Gamma(L))\widetilde{\lambda}^j, j = f, z$, $\mu_t \sim N(0, H_t)$, $H = diag(\exp(h_{1t}), \cdots, \exp(h_{nt}))$, $h_{it} = h_{it-1} + \theta_t^h$, $\theta_t^h \sim N(0, \sigma_h)$.

Refer to Primiceri [39], Cogley and Sargent [40] to decompose the model disturbance term as follows:

$$A_t \Omega_t A'_t = \Sigma_t \Sigma'_t \tag{5}$$

In Equation (5), $\Sigma_t = diag(\sigma_{1,t}, \cdots, \sigma_{m,t})$ and A_t is the lower triangular matrix with main pair line of 1 in the following form:

$$A_t = \begin{bmatrix} 1 & 0 & \cdots & 0 \\ a_{21,1} & 1 & \ddots & \vdots \\ \vdots & \ddots & \ddots & 0 \\ a_{m1,t} & \cdots & a_{m(m-1),t} & 1 \end{bmatrix} \tag{6}$$

Embed all regression coefficients in Equation (2) into matrix $B_t = \left(vec(b_{1t})', \cdots, vec(b_{pt})'\right)'$, and random volatility parameters are embedded into matrix $\log \sigma_t = (\log \sigma'_{1t}, \cdots, \log \sigma'_{mt})'$. The parameters in constraint matrix A_t are embedded into $\alpha_t = \left(a'_{j1,t}, \cdots, a'_{j(j-1),t}\right)'$, $j = 1, \cdots, m$. Referring to the research of Giordani and Kohn [41], the above parameter matrix is set as random walk form:

$$\begin{cases} B_t = B_{t-1} + J_t^B \eta_t^B \\ a_t = a_{t-1} + J_t^a \eta_t^a \\ \log \sigma_t = \log \sigma_{t-1} + J_t^\sigma \eta_t^\sigma \end{cases} \tag{7}$$

In Equation (7), $\eta_t^j \sim N(\mathbf{0}, Q_j)$ is the disturbance vector, $j \in \{B_t, a_t, \log \sigma_t\}$, and Q_j is the variance covariance matrix of the disturbance vector. J_t is an indicative variable. When $J_t = 1$, it means that the parameter has time-varying characteristics, and when $J_t = 0$, it means that the parameter does not have time-varying characteristics.

The TVP-FAVAR model constructed by the combination of Equations (2) and (4) can be transformed into the following form by using the lag operator:

$$g_t = \Lambda y_t + \Gamma(L) g_t + W_t \xi_t^g \tag{8}$$

$$y_t = B_t(L) y_t + A_t^{-1} \Sigma_t \xi_t^y \tag{9}$$

where $g'_t = [x'_t, z'_t]$, $y'_t = [f'_t, z'_t]$, $W_t = diag(\exp(h_{1t})/2, \cdots, \exp(h_{nt})/2, 0_v)$, $W_t W'_t = [H_t, 0_v]'$, $B_t(L) = b_{it}L + \cdots + b_{pt}L^p$, $\left(\xi_t^g, \xi_t^y\right)$ is an independent and identically distributed perturbation column vector and obeys the standard normal distribution. $\Lambda(1,1) = \lambda^f, \Lambda(1,2) = \lambda^z, \Lambda(2,1) = 0, \Lambda(2,2) = I$. By substituting Equation (9) into Equation (8), the vector moving average (VMA) process can be obtained:

$$g_t = \widetilde{\Gamma}(L)^{-1} \Lambda \widetilde{B}_t(L)^{-1} {A_t}^{-1} \Sigma_t \xi_t^y + \widetilde{\Gamma}(L)^{-1} W_t \xi_t^g = \Delta_t(L) \varsigma_t. \tag{10}$$

In Equation (10), $\widetilde{B}_t(L) = I - B_t(L)$, $\widetilde{\Gamma}(L) = I - \Gamma(L)$, $\varsigma_t \sim N(0, I)$ is the perturbation column vector.

In fact, based on the above model introduction, we can see that the advantages of the TVP-FAVAR model are mainly reflected in two aspects: On the one hand, the model mines the valuable information contained in many economic data with maximum efficiency. On the other hand, the dynamic evolution mechanism more in line with the characteristics of realistic economic development is reflected in the model construction. In order to more clearly explain the advantages of the above model, we record Equations (2) and (3) as the FAVAR model and factor regression equation, respectively. Firstly, based on the factor regression equation, it can be found that each economic variable contained in the model is closely related to the extracted common factors, which allows the model to contain as much macro information provided by the real economy as possible. Secondly, the FAVAR model reflects the correlation mechanism between the concerned policy variables and common factors, and the correlation mechanism has dynamic time-varying characteristics, which is mainly reflected in that the regression coefficient and the variance covariance matrix of the disturbance term in the model are unsteady at each sample time point, so as to achieve the goal of more accurately describing the dynamic development of the real economy.

3. Empirical Results

The key to forming a "new development pattern" with internal circulation as the main body is to give full play to the huge potential domestic demand. In order to stimulate the potential consumption power, the regulation ability of fiscal and tax policies cannot be ignored. Based on this, this paper analyzes the dynamic impact of fiscal and tax policy changes on the macroeconomy based on the TVP-FAVAR model introduced above, in order to provide data support and policy reference for alleviating the downward pressure of the domestic economy and stimulating the domestic consumption potential at this stage.

3.1. Data and Sources

Based on the TVP-FAVAR model framework, in order to clearly describe the dynamic impact of fiscal and tax policies on macroeconomy, it is necessary to select the fiscal and tax policy variables and the economic variables required to extract common factors. Fiscal and tax variables include total tax, value-added tax (VAT), consumption tax and personal income tax. The total tax variable (τ_t) is expressed by the ratio of tax to GDP in the current period, and the variables of value-added tax, consumption tax and personal income tax are expressed by the ratio of their current value to the current value of tax, and are recorded as τ_v, τ_c and τ_i respectively.

For the economic variables needed to extract common factors, this paper extracts a small number of common factors from the data set containing a large amount of economic information into the model. The macroeconomic information set is composed of 97 economic variables from three levels, which are specifically divided into output class, price class and consumption class. Among them, the output class is composed of 21 variables such as industry added value; the consumption class consists of 38 variables, including the total retail sales of social consumer goods, the consumer expectation index, and the total retail sales of enterprises above the quota; the price class consists of 38 variables, including CPI, retail commodity price index and industrial producer price index. The specific data indicators are shown in Table 1. The above economic data are from the statistical database of China economic network. The samples are selected from 2002q1 to 2021q2, and all the above observed variables use the X-13 method to eliminate the seasonal components.

Table 1. Specific indicators contained in various factors.

Factor Class	Number of Indicators	Specific Indicators
Output class	21	Cumulative GDP and current year-on-year growth, the cumulative added value of the primary industry and the year-on-year growth rate of the current period, cumulative added value of secondary industry and year-on-year growth rate of the current period, year on year growth of tertiary industry and cumulative increase in current value, cumulative industrial added value and current year-on-year growth, year on year growth rate of added value of agriculture, forestry, animal husbandry and fishery in the current period, current and cumulative year-on-year growth rate of industry added value (including construction industry, wholesale and retail industry, accommodation and catering, finance, real estate).
Consumption class	38	Current and cumulative year-on-year growth of total retail sales of social consumer goods, consumer expectation index, consumer confidence index, current and cumulative year-on-year growth of total retail sales of enterprises above designated size (including cosmetics, clothing, textile products, household appliances and audio-visual equipment, sports and entertainment products, communication equipment, books, newspapers and magazines, cultural and office supplies, tobacco and alcohol, beverages, Chinese and Western medicines, building decoration, gold and silver jewelry, automobiles, daily necessities, petroleum and products, furniture).
Price class	38	Price of rural residents, consumption index of urban residents, consumer price index of urban residents (including grain, eggs, aquatic products, fresh vegetables, fresh fruits, health care, transportation and communication, residence, clothing), consumer price index of rural residents (including grain, eggs, aquatic products, fresh vegetables, fresh fruits, medical care, transportation and communication, residence and clothing), retail price index, commodity retail price index (including food, clothing, shoes and hats, textiles, daily necessities, cosmetics, beverages, tobacco and alcohol), PPI categories (including means of production, extracted goods, raw materials, processed products, means of subsistence, food, clothing, general daily necessities and consumer durables).

In order to clearly observe the correlation between the factors extracted by the TVP-FAVAR model and the actual macro data, this paper draws the factor series of output, consumption and price and the corresponding real macro data, as shown in Figure 1. Based on the timing chart drawn in Figure 1, it can be seen that the output factor, consumption factor and price factor are highly consistent with the year-on-year growth of standardized GDP, the year-on-year growth of standardized retail sales of social consumer goods and the trend of standardized consumer price index. Among them, the output factor and consumption factor both showed obvious V-shaped trends in 2008 and 2020. These two time points correspond to the outbreak of the U.S. financial crisis and the COVID-19 pandemic, which led to a brief decline in China's output and consumption. This also shows that the factor subsequence extracted by the model is in line with the dynamic change of a major economic variable in reality. It should be pointed out that the real macro data drawn in Figure 1 are standardized because the model needs to standardize the selected specific economic indicators when extracting a certain type of factor. In this paper, in order to compare the convergence between the factor sequence and the trend of the actual macro data, similar processing is also carried out when drawing the sequence diagram.

3.2. Analysis of Total Tax

This paper examines the dynamic impact of the tax reduction policy on macroeconomic variables such as output, consumption and price at the level of total tax. Figure 2 shows the three-dimensional impulse response diagram of various factors to the negative impact of one unit of total tax revenue. Based on the information in the diagram, it can be seen that the output and consumption factors have a strong positive effect on the impact of tax reduction since 2016, while the price factor has a positive response to the decline of intensity. The opposite was true before 2016. This shows that in recent years, especially under the goal of a "new development pattern", tax reduction can achieve the goal of

promoting the strong growth of domestic economy and consumption capacity, and will not cause a significant rise in price level.

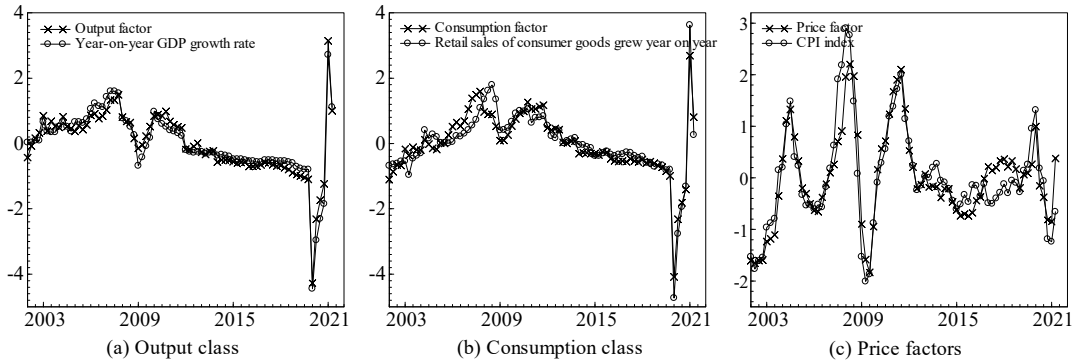

Figure 1. Output, consumption and price factors, and corresponding macro data series.

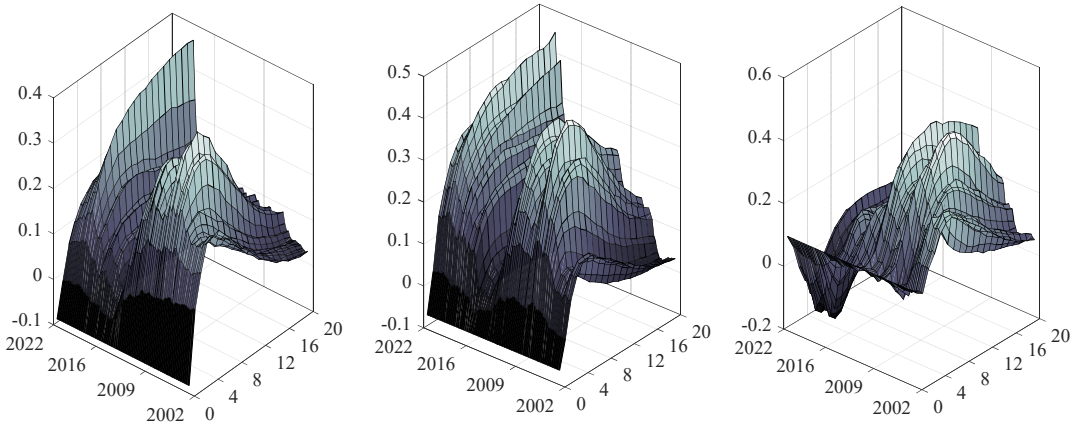

Figure 2. Three-dimensional impulse response diagram of output, consumption and price factors to the negative impact of total tax.

After China's successful accession to the WTO, the proportion of total foreign trade in GDP has increased year by year, prompting China's economy to participate more and more deeply in the international economic cycle, and gradually forming an enterprise reproduction pattern of "two ends out". As the COVID-19 pandemic has injected great uncertainty into China's foreign-oriented economic development model, the central government has put forward the strategy of "accelerating the construction of a new development pattern with the domestic big cycle as the main body and the domestic and international double cycles promoting each other". Traditional domestic demand includes consumption and investment. Whenever there is great downward pressure on the economy, the government will use investment means, especially infrastructure investment, to promote economic recovery. However, considering that the local government debt problem is relatively severe at this stage and the central bank maintains a prudent monetary policy, it is obviously inappropriate to rely on large-scale investment to stimulate domestic demand. Therefore, expanding domestic demand is based on stimulating domestic consumption.

However, it should be acknowledged that China's current consumption level is not enough to support the "new development pattern" dominated by internal circulation, mainly because China's household final consumption accounts for only 39% of GDP, far lower than 68% in the United States, 65% in the United Kingdom and 56% in Japan [42]. Based on the information given in Figure 2, the decline of total tax at this stage is conducive to the increase in output and consumption level, without causing a sharp rise in price level. In view of this, China should continue to implement the tax reduction policy at the current stage—while maintaining the continuity of the policy—making efforts from

the demand side to further release the consumption potential of residents and further enhance the resilience of economic development, so as to gradually achieve the goal of "new development pattern" with the domestic cycle as the main body.

As one of the main tools for the government to regulate and control the macroeconomy, the above empirical verification shows that the reduction in total tax revenue is conducive to the increase in the consumption and output level. However, tax revenue follows the principle of "taking it from the people for the people". Blindly reducing the tax level also means the decline in the government's spending ability, which will weaken the government's macro-control ability. This is not in line with the basic strategy of the new era of "the market plays a decisive role in resource allocation and gives better play to the role of the government". Therefore, considering that the tax burden is regressive and progressive, we also need to further investigate the dynamic impact of different fiscal and tax structures on the macroeconomy in order to provide detailed data support for the realization of the goal of "new development pattern".

3.3. Analysis of Tax Structure

In view of the current strategic goal of accelerating the construction of a "new development pattern" and the urgent reality of not weakening the macro-control ability of the government, this paper needs to bring the regressivity and progressivity of different taxes into the analysis category. In the total tax revenue, VAT accounts for the largest proportion of the first tax, is a tax on the consumption of social groups, and has a certain degree of tax burden regressive. Based on the impulse response diagram of the impact of output, consumption and price factors on the burden of VAT drawn in Figure 3, it can be found that the reduction in value-added tax has a strong promoting effect on the actual variables such as output and consumption in the near future, but it also has an obvious positive pulling effect on the nominal variables of price.

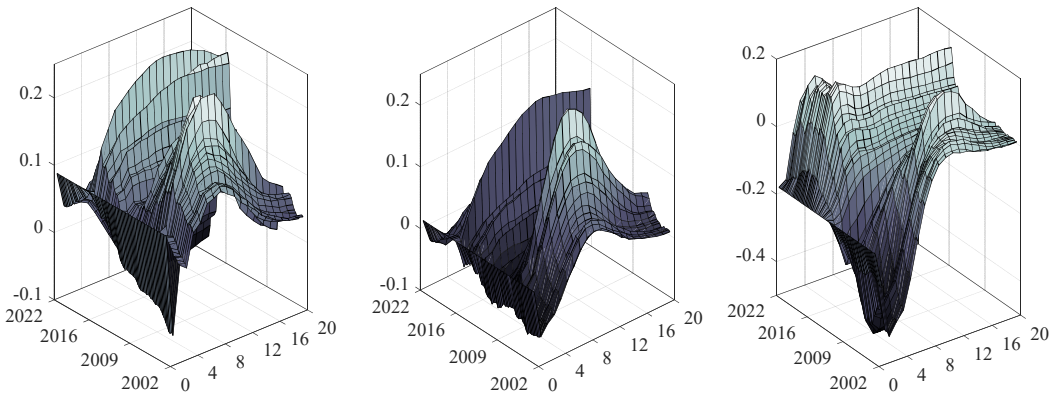

Figure 3. Three-dimensional impulse response diagram of output, consumption and price factors to the negative impact of VAT.

The VAT reduction will not only reduce the burden on low-income people, but also improve the vitality of domestic demand. In fact, China's standard VAT rate is only 13%, far lower than that of developed countries, but China's VAT does not implement the policy of a low or zero tax rate on the necessities in people's lives, leading to obvious regressive. On the contrary, the VAT rate of developed countries (such as the European Union countries) is at a higher level, but with a low tax policy for food, medicines and other daily necessities; thus, it reduces the tax burden in consumer spending in low-income families and weakens the VAT regressive tax, raising the consumption ability to form a strong society. It should be clearly pointed out here that although there are two low tax rates of 6% and 9% in China's VAT, such a low tax rate policy is only applicable to agricultural products, water and electricity, and agricultural production inputs. If agricultural products are processed

into finished products, the standard tax rate is 13%. Therefore, it does not apply to basic necessities such as food and medicine needed by families.

Because the value-added tax with a regressive nature plays a leading role in China's total tax revenue, while the consumption tax and personal income tax with a progressive nature account for a relatively low proportion in the total tax revenue, the tax revenue generally presents a regressive nature. Consistent with the above empirical results, the negative impact of total tax is conducive to the positive increase in real variables such as output and consumption. Empirical analysis also further confirms that the decline in the proportion of regressive VAT in the total tax revenue can effectively promote the increase in economic variables such as output and consumption at the present stage. Considering the reality of a weak domestic demand, reducing VAT or expanding the coverage of low VAT rates (mainly focusing on the basic necessities of family life) is bound to release social consumption potential and promote economic growth. In addition, it should be noted that the decline of value-added tax will exert upward pressure on the price level. The two core tools of the government's macro-control, fiscal and monetary policies need to effectively regulate the price level under the strategic pattern of "taking the domestic cycle as the main body" through the reduction in value-added tax measures. This empirical result also provides a reasonable opportunity for the coordination of monetary and fiscal policies.

The above empirical results show that the reduction in regressive VAT is beneficial to the growth of actual variables, such as output and consumption. Next, this paper needs to analyze the macro impact of progressive changes in consumption tax and individual income tax. Figure 4 depicts a three-dimensional impulse response diagram of consumption tax's negative impact on output, consumption, price and other factors. Generally speaking, the consumption tax reduction has a positive driving effect on output, consumption, price and other factors, but its promoting effect is relatively weak, especially in the recent very weak driving effect on consumption variables.

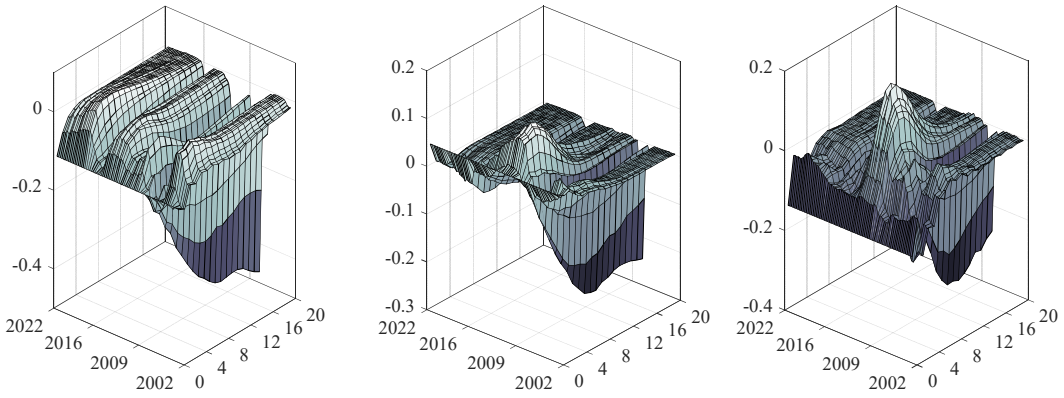

Figure 4. Three-dimensional impulse response diagram of output, consumption and price factors to the negative impact of consumption tax.

China's consumption tax is mainly levied on non-necessities such as cigarettes, alcohol products and cosmetics. It is a kind of selective direct tax, which can be levied on non-necessities or luxury goods. Therefore, the reduction in consumption tax does not really stimulate the potential demand for household necessities, and it shows a relatively weak promotion effect on output and consumption in the impulse response of Figure 4. In fact, China's consumption tax accounts for about 6% of the total tax revenue, far lower than the level of OECD countries in the same period (the ratio of consumption tax to the total tax revenue is about 12%). Considering the significant targeting of consumption tax compared with high-income families, middle- and low-income families have a lower consumption intention on non-necessities or luxuries. At this time, raising the consumption tax in the proportion of the total tax will not slash the potential domestic consumption level, but a progressive consumption tax increase can make up for regressive tax revenues and keep

the total tax level; the government can reduce the income gap by using transfer payment means to achieve the effect of an effective stimulate domestic consumption potential.

It can also be found in Figure 4 that the recent consumption tax reduction has a relatively weak impact on nominal price variables. On the one hand, the consumption tax is mainly levied on non-necessities or luxury goods, and its tax reduction does not lead to a sharp surge in demand, so the price factor does not show a sharp rise. On the other hand, the price factor mainly reflects the price fluctuation trend of packaged goods consumed by residents in a period of time, and the non-necessities or luxury goods only account for a small weight. The price increase caused by the decrease in consumption tax and the demand side is not fully reflected in the price factor fluctuation. Therefore, China's consumption tax in the future reform has a lot of room for improvement.

In addition to consumption tax, personal income tax is also progressive. Figure 5 depicts the three-dimensional impulse response of individual income tax's negative impact on output, consumption, price and other factors. Based on the impulse response curve in Figure 5, it can be clearly seen that the reduction in personal income tax has a positive promoting effect on output, consumption, price and other variables, and the positive promoting effect gradually weakens with the advance of sample time; especially in recent years, the positive increasing effect of output, consumption and other actual variables has the largest attenuation range.

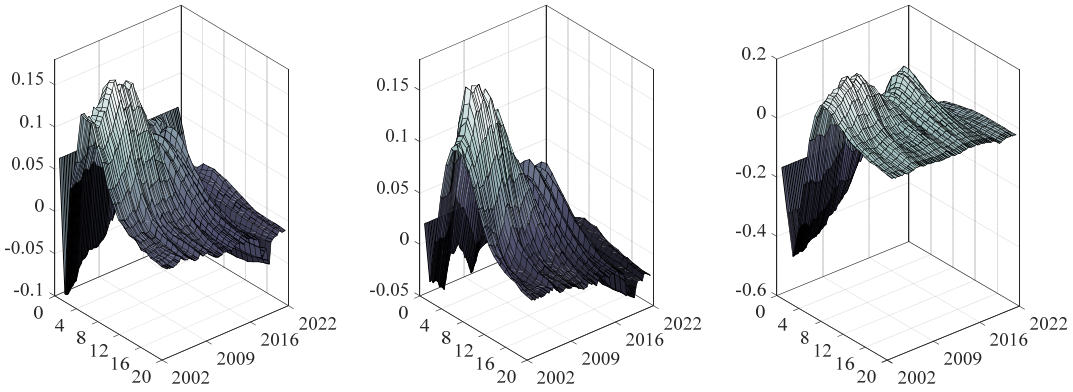

Figure 5. Three-dimensional impulse response diagram of output, consumption and price factors to the negative impact of individual income tax.

Under the strategy of accelerating the construction of a new development pattern with domestic consumption as the main body, the government's fiscal and taxation system should first increase the consumption capacity of residents, which needs to narrow the income gap through personal income tax. Compared with developed countries, the means of fiscal redistribution in China is in a weak position, in which the proportion of personal income tax to the total tax revenue is about 5%, while the value of developed countries is about 25%. In China's tax system, individual income tax is the core of direct tax, but also the most able to play the role of income regulation tax. In 2018 and 2019, China carried out a large-scale adjustment of individual income tax. This reform mainly revised the tax rate table and comprehensively levied labor income, and finally realized that the tax burden of most middle- and low-income taxpayers reduced, while the tax burden of high-income taxpayers with multiple incomes increased. Combined with the information given in Figure 5, the reduction in personal income tax in China has a weak boost to actual variables such as output and consumption. On the one hand, the role of individual income tax in adjusting the income gap has not been fully played, that is, there is room for further improvement of the individual income tax levied on high-income groups, and the effect of "pumping fat into thin" can be achieved by improving the comprehensive income range and the collection of property income. On the other hand, our country's individual income tax is an important component of the direct tax; the calculation data above show that the

proportion of individual income tax to total tax in our country is far lower than developed countries, but improving direct tax is a gradual process, and is not "a one-stop effort". At the same time, although the recent tax reform policy will improve the redistribution function of individual income tax to a certain extent, it will not change significantly in a short time.

So far, this paper has completed a comprehensive analysis of the effects of different tax changes on macroeconomics with progressive and regressive characteristics. As can be seen from the empirical results, the regressive VAT reduction has the strongest boost to output, consumption and other real variables, while the progressive consumption tax and individual income tax reduction has a weak pull effect on output, consumption and other real variables in the recent period. "Suggestions of the Central Committee of the Communist Party of China on formulating the fourteenth five-year plan for national economic and social development and the long-term goals for 2035" clearly put forward "optimize the tax structure, appropriately increase the proportion of direct tax", which undoubtedly requires the reform of personal income tax. However, international experience shows that direct tax reform is a gradual process. High personal income tax rate may cause efficiency loss to a certain extent while adjusting income distribution, that is, replacing work with leisure and weakening people's enthusiasm for work. However, this does not mean that the progressivity of individual income tax cannot be improved. It can be improved through indirect tax reform such as VAT and consumption tax. One is to improve the progressivity of the tax system by using different VAT rates, the other is to improve the fairness of the tax system by increasing the intensity of the consumption tax collection.

4. Conclusions and Policy Implications

Based on the goal of accelerating the construction of a "new development pattern", this paper examines the economic growth effect of China's fiscal policy at the aggregate and structural levels by constructing the TVP-FAVAR model. The research conclusions are as follows:

(1) At the general tax level, in order to speed up the construction of the development strategy with the domestic cycle as the main body, China should continue to implement the tax reduction policy and ensure the continuity of the tax policy. The empirical results show that the reduction in total tax has a promoting effect on real variables such as output and consumption. Especially at this stage, the promoting effect of total tax reduction on economic growth is relatively strong, while the stimulating effect on price is relatively weak. Since China's current consumption level is not enough to support the "new development pattern" with internal circulation as the main body, the government departments should continue to implement the tax reduction policy, and while maintaining the continuity of the policy, promote the further release of residents' consumption potential and further enhance the resilience of economic development, so as to achieve the goal of a "new development pattern" with domestic circulation as the main body.

(2) At the level of tax structure, we should reduce the proportion of regressive value-added tax in the total tax, and increase the proportion of progressive personal income tax and consumption tax in the total tax. The results show that the reduction in value-added tax in the realization stage has a strong promoting effect on the actual variables such as output and consumption, which is consistent with the empirical results of total tax. The reduction in consumption tax and personal income tax has a positive pulling effect on output, consumption and price, but its promoting effect is relatively weak; especially in the current period, the promoting effect on output and consumption is very limited. This also shows that China's fiscal and tax structure that is dominated by indirect tax and supplemented by direct tax cannot realize the function of adjusting income redistribution; it is not conducive to fiscal and tax policies to play a positive role in stimulating residents' consumption and promoting economic growth.

To sum up, the high tax burden and the weakening of the income redistribution function caused by the fiscal and tax structure are the main reasons for the weak economic growth effect of fiscal and tax policies and the low role of stimulating residents' consumption. Therefore, strengthening the function of income distribution by reducing the tax burden and adjusting the fiscal and tax structure is the key to accelerating the construction of a "new development pattern" with the help of fiscal and tax policies. Combined with the above research conclusions, this paper puts forward the following corresponding policy suggestions:

(1) Continue to vigorously implement the tax reduction policy and ensure the continuity of the tax reduction policy. As the main driving force to promote the construction of the "new development pattern", the direct purpose of the tax reduction policy is to reduce the operating costs, labor costs and personal living costs of enterprises, so as to increase the disposable income of individuals and enterprises and promote the sustainable growth of social consumption and output. In fact, there are a large number of short-term preferential policies in China, but they are basically temporary tax measures. In recent years, tax reforms such as "replacing business tax with value-added tax" and income tax have been solidified into systems in the form of laws and regulations, which is obviously different from the temporary tax reduction measures introduced in the past to cooperate with specific policies. It is a long-term system construction with good continuity. In this way, we can not only achieve the goal of reducing the tax burden of economic actors, but also stimulate residents' consumption and then improve the output level.

(2) Optimize the tax structure and give better play to the regulatory role of fiscal and tax policies in income redistribution, that is, increase the total tax proportion of direct tax and reduce the total tax proportion of indirect tax. China's value-added tax (indirect tax) has always been the main contributor to the total tax, while the ratio of income tax and consumption tax (direct tax) with a strong income redistribution regulation to the total tax is relatively low. This tax structure leads to the weak income regulation of fiscal and tax policies, which leads to the current situation of tax regressivity. In the "new development pattern", the meaning of the topic of taking the domestic cycle as the main body is to expand domestic residents' consumption. Therefore, the corresponding fiscal and tax policies should not only reduce the cost of economic actors, but also further optimize the tax structure to improve its ability to regulate income redistribution, so as to realize the use of tax policies to promote domestic consumption and sustained economic growth.

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