

Macroeconomic Effects of Capital Income Tax Adjustment: A DSGE-based Numerical Simulation Analysis

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Abstract. China's economy has already entered a new normal, and the voice of "reducing taxes and fees and stimulating economic vitality" is growing. It is urgent to improve and implement the active structural tax reduction policy. This paper constructs a multisectoral DSGE model including heterogeneous households, consumer goods manufacturers, real estate manufacturers, monetary authorities and financial authorities. It simulates the macroeconomic effects of capital income tax adjustment from a comparatively static point of view, explores the potential differences in the impact on various households and manufacturers, and clarifies the transmission mechanism. This paper finds that with the decreasing tax rate of capital income tax, the main macroeconomic variables have significant crowding-in effect, and the investment crowding-in effect is the most obvious for the two types of firms, followed by the corresponding departments' output and labor supply. Finally, the corresponding policy recommendations are put forward.

1. Introduction

China is in a period of major reform and transformation. The economy has changed from a stage of high-speed growth to a stage of high-quality development. It is in a critical period of transforming the mode of development, optimizing the economic structure and transforming the driving force of growth. Various financial and debt risk problems emerge in an endless stream. The uncertainty of the external environment caused by the intensification of trade frictions increases sharply, and the economic situation becomes increasingly grim. The space of monetary policy regulation is more and more pressing. Fiscal policy should play a greater role in the structural reform of supply side. However, China's tax structure and policies also have some significant problems, which are difficult to maintain good coordination and adaptation with the current stage of economic development and economic development structure. This paper constructs a multi-sectoral DSGE model including heterogeneous household sector, consumer goods manufacturer sector, real estate manufacturer sector, monetary policy sector and government financial authorities, and introduces many factors such as price rigidity, investment adjustment cost and so on, to study the macroeconomic effects of capital income tax adjustment from a comparatively static point of view by numerical simulation.

2. Modeling

Patient family. Referring to the model setting methods of Iacoviello and Neri (2010) [1], we introduce real estate variables and government expenditure items into the standard household sector utility function. In addition to normal wage income, patiently households with capital can obtain capital investment returns, loan interest and profit transfer of enterprises:

$$E_0 \sum_{t=0}^{\infty} (\beta')^t U(C_t', h_t', g_t', n_{ct}', n_{ht}') \\ E_0 \sum_{t=0}^{\infty} (\beta')^t \left\{ \ln C_t' + \ln h_t' + \ln g_t' - \frac{(n_{ct}')^{1+\xi} + (n_{ht}')^{1+\xi}}{1+\eta} \right\}$$

Family lacking patience. Similar to the model of the non-credit-constrained patient household

sector, its income is only normal wage income and borrowing income:

$$E_0 \sum_{t=0}^{\infty} (\beta'')^t U(C_t'', h_t'', g_t'', n_{ct}'', n_{ht}'') \\ = E_0 \sum_{t=0}^{\infty} (\beta'')^t \left\{ \ln C_t'' + \ln h_t'' + \ln g_t'' - \frac{(n_{ct}''^{1+\xi} + n_{ht}''^{1+\xi})^{\frac{1+\eta}{1+\xi}}}{1+\eta} \right\}$$

Manufacturer sector. In this paper, the manufacturer department is divided into ordinary consumer goods producers and real estate producers, while ordinary consumer goods producers are divided into final products producers and intermediaries producers. The production function form of ordinary consumer goods producers is as follows:

$$Y_{ct} = A_{ct} K_{ct-1}^{\mu_c} (n_{ct}'^{\alpha} n_{ct}''^{1-\alpha})^{1-\mu_c}$$

Real estate producers. Real estate producers have similar production functions:

$$Y_{ht} = A_{ht} K_{ht-1}^{\mu_h} (n_{ht}'^{\alpha} n_{ht}''^{1-\alpha})^{1-\mu_h}$$

Financial authorities. For the government departments, they are mainly responsible for providing various kinds of public services and other functions for the society and citizens. The revenue is mainly collected through tax planning and government debt financing, and is restricted by the relevant government budget constraints. It is necessary to maintain the budget balance of government revenue and expenditure in each year.

Monetary authority. In this paper, the interest rate rule proposed by Taylor (1993) [2] is used to describe monetary policy and Clarida et al. (2000) [3] is used to introduce the interest rate smoothing coefficient. The monetary policy authorities need to adjust the interest rate in time according to the current inflation and output gap. Of course, the current interest rate is also affected by the previous interest rate.

Market clearance. So far, this paper has completely depicted the optimization problem of the economic subjects in the whole equilibrium system under the relevant constraints: various families achieve the maximization of their expected utility, ordinary consumer goods manufacturers departments and real estate manufacturers departments achieve the maximization of expected operating profits, at which time the whole market is in the state of economic equilibrium or called the state of complete market liquidation.

3. Empirical Analysis

The impact of capital income tax adjustment on various household sectors. Referring to the relevant research experience stated in the above chapters, the current capital income tax rate in China is calibrated at 0.21724. From the final simulation results of the specific model in Table 4-6, we can see that the impact of capital income tax reduction on two types of household sectors and related variables is positive. With the decreasing of capital income tax rate, the daily consumption of both types of households has increased significantly, the consumption of patient households has increased by 12.99%, and that of impatient households has increased by 10.26%, compared with those of impatient households. Families with patience have seen a slightly larger increase in consumption; however, the labor supply of the two types of households to the two types of manufacturer sectors has also shown an increasing trend of crowding in. The labor supply of the patient household sector to the general consumer goods manufacturer sector and the real estate manufacturer sector has increased by 2.44% and 6.51% respectively, while the impatient household sector to the general consumer goods manufacturer sector and the real estate manufacturer sector has Labor supply increased by 0.66% and 1.06% respectively. Comparing with this, the increase of labor supply of patient families to the real estate sector is more obvious.

The impact of capital income tax adjustment on various manufacturers and departments.

Observed from Table 4-6, it is obvious that the impact of capital income tax reduction on both types of firms and related variables is positive; with the decreasing of capital income tax rate, the output of both types of firms shows an increasing trend of crowding in, the output of general consumer goods firms increased by 9.73%, and the output of real estate firms increased by 13.19%. In addition, the effect of capital income tax reduction on investment crowding in the two types of firms is more significant, and the investment of consumer goods firms and real estate firms increased by 22.11% and 25.36%, respectively. According to the existing research experience and the analysis of the actual economic operation, the capital tax reduction stimulates the increase of various types of investment, and the growth of capital stock expands the demand of enterprises for labor force, which in turn stimulates the increase of various types of labor supply and the rise of total output level (Cui Zhiwen [4], 2011). Moreover, the capital tax reduction reduces the tax burden of the patient family sector and increases its expenditure. Income allotment and the investment wealth effect of the final capital increase the consumption of the patient household sector, while the consumption of the impatient household sector increases with the employment and income changes, so the overall consumption and total output of residents are crowded in.

Table 1

τ^k	Y	Yc	Yh	c'	c''
-10%	0.76%	2.46%	3.28%	3.22%	2.59%
-20%	1.50%	4.90%	6.55%	6.45%	5.16%
-30%	2.21%	7.32%	9.86%	9.70%	7.72%
-40%	2.92%	9.73%	13.19%	12.99%	10.26%

τ^k	Ic	Ih	n'_c	n'_h	n''_c	n''_h
-10%	5.36%	6.03%	0.66%	1.67%	0.16%	0.26%
-20%	10.82%	12.28%	1.29%	3.31%	0.33%	0.53%
-30%	16.44%	18.73%	1.88%	4.92%	0.49%	0.78%
-40%	22.11%	25.36%	2.44%	6.51%	0.66%	1.06%

4. Conclusions and Recommendations

With the decreasing tax rate of capital income tax, the main macroeconomic variables examined in this paper have significant crowding-in effect, and the investment crowding-in effect is the most obvious for the two types of firms, followed by the corresponding increase in output and labor supply.

At present, the government should speed up the promotion of active fiscal and taxation policies, implement structural tax reduction and constantly improve and optimize tax policy tools. At the same time, it should pay attention to the rational collocation of various taxes according to the current macroeconomic control objectives, and strengthen the coordination between fiscal and monetary policies.

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