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Welfare analysis on optimal enterprise tax rate in China ☆

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ABSTRACT

This paper builds a model of general equilibrium for production economies to analyze Chinese enterprise tax reform which regulated the unified enterprise tax rate to be at 25%. The reform was backed by the new Law on Corporate Income Tax executed from January 1, 2008. Using national statistics of 2007, we obtain that the optimal unified enterprise tax rate for manufacturing industries is 21.82% if tax revenue is given. In addition, we find the globally optimal enterprise tax rates are 33.11%, 18.17%, and 18.06% for state-owned enterprises (SOEs), foreign invested enterprises (FIEs) and other private enterprises (OPEs), respectively. Our results suggest the achieved aim to pack those inefficient FIEs off and gain a competitive edge for China. Comparing the optimal unified enterprise tax rate equilibrium with benchmark equilibrium, unified enterprise tax rate at 25% equilibrium and globally optimal enterprise tax rate equilibrium, we conclude that the optimal unified enterprise tax rate (21.82%) is an efficient policy for Chinese government. At last, it shows the reliability of the conclusion when sensitivity analysis on enterprise tax rate for FIEs and premium coefficient is performed for optimal unified enterprise tax rate equilibrium.

1. Introduction

The new law on enterprise tax has been put into practice in China since January 1, 2008. This law unifies the tax rates for domestic (invested) enterprises and foreign invested enterprises (FIEs) which were unequal. Few economists do research theoretically on this problem whether, in whole, this reform of unified enterprise tax rate promotes or inhibits economic growth.

China was implementing a series of favorable terms for foreign invested enterprises in order to bring in foreign investment after the policy of reform and opening-up. One of the important terms was to cut down enterprise tax rate into a low level. Owing to those favorable terms, the amount of foreign investments rose steadily year by year and China's FDI (foreign direct investment) reaches 74.8 billion USD in 2007. Not only foreign invested enterprises did bring funds, which improved the situation of shortage of money, but introduced advanced technology and administrative experiences, and supplied large numbers of job offers. All of these highly contributed to China's rapid economic development. However, the super national-wide treatment for foreign invested enterprises drove domestic enterprises at a disadvantage, and at the meantime, most of those foreign invested enterprises in China were labor-intensive, or at the middle- and low-end of the industry chain. By right of China's low cost of labor, land and raw materials, foreign invested enterprises made huge profits while negatively affected China's resources and environment. Therefore, the central government started to consider cleaning out the mass environmental pollution and intensive energy consumption in the wake of those low value-added enterprises, and updating the industrial structure for the sake of development of China's economy. Under such circumstances, the Law on Enterprise Tax was adopted at the 5th Session of the Standing Committee of the 10th National People's Congress of the People's Republic of China. The new law unified the enterprise tax rate at 25% and was comprehensively enforced as of January 1, 2008.

Wang (1995) investigates the dual tax system which implies different tax rates, as well as different operations on tax deduction and tax base, and concludes that domestic enterprises' tax burden is more severe than foreign enterprises. Chen (2003) finds out that the difference of domestic and foreign enterprises tax burden stems from the different requirements of tax credit and tax rate, and shows empirically that the real tax burden of domestic enterprises is twice as much as that of foreign enterprises. Whalley and Wang (2007) explore the effect of state-owned enterprises on social welfare after the new Law on Enterprise Tax came into force. They build models with a general equilibrium of state-owned enterprises controlled by workers and by managers. Using statistics of 2004, they conclude in the general equilibrium model of state-owned enterprises controlled by workers that there is a 0.26% welfare loss under the new Law of Enterprise Tax, and even

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more loss in the optimal tax structure; whereas in the general equilibrium model of state-owned enterprises controlled by managers, the first loss is 0.19%. van der Hoek et al. (2008) survey the effect of the new Law of Enterprise Tax on foreign invested enterprises. They show that implementing of unified tax rate is a necessary reform so that the new law would do no harm on the increment of foreign investments. Moreover, since the increased tax rate of foreign invested enterprises by the new law made them the most progressive ones, the reform of enterprise tax impacted positively on China's economic growth.

The existing literature has not answered an important question: what the optimal unified tax rate for manufacturing industries is. Although Whalley and Wang (2007) have discussed the optimal tax rate, to define it they create a case where state-owned enterprises apply one rate and there is another one for foreign invested enterprises and other private enterprises. That means in their paper there are still more than one tax rate. In our paper, however, the optimal unified enterprise tax rate (OUETR) is defined as a unified one for all manufacturing sectors under optimization of maximizing the social welfare. Besides, this paper uses the data of 2007, with the feature of cancelled agricultural tax; while Whalley and Wang (2007) use the data of 2004 which includes agricultural tax. Furthermore, we loose the restriction that different sectors have to share a unique enterprise tax rate to investigate the globally optimal enterprise tax rates (GOETRs). Thus globally optimal enterprise tax rate area is a set of rates rather than a sole one. To put it another way, globally optimal enterprise tax rates are those for corresponding sectors with which the whole economy reaches its optimum.

By application of the CGE model, this paper focuses on solving the optimal tax rate through the following steps. In the general equilibrium model, we have four production sectors. They are agricultural sector (Agriculture), state-owned enterprises (SOEs), foreign invested enterprises (FIEs) and other private enterprises (OPEs). The added value of the secondary and tertiary industries is distributed into the last three sectors according to the corresponding share of manufacturing added value. The wage rate and the return of capital are determined by competitive market conditions for those non state-owned enterprises. As to monopolistic state-owned enterprises, the wage rate is assumed to be administratively fixed, and the return to capital is decided by the marginal product with respect to the input since capital flows freely among sectors. Based on the data of 2007, we calibrate the parameters of the production function and the utility function in the model, and obtain the optimal enterprise unified tax rate (OUETR) of 21.82% and globally optimal enterprise tax rates (GOETRs) with the results for SOEs, FIEs and OPEs of 33.11%, 18.17% and 18.06%, respectively with the given tax revenue. To reach the optimum, the labor input moves from agricultural sector to manufacturing sectors, and the capital input moves from agricultural and SOE sectors to FIE and OPE sectors, with the output in agricultural and FIE sectors decreasing and in SOE and OPE sectors increasing.

Compared with UETR25-equilibrium (i.e., equilibrium with the unified enterprise tax rate of 25%),[3] there are increments on social welfare, national income and expenditure in the equilibrium with the optimal unified tax rate of 21.82%, and we also make a comparison between OUETR-equilibrium (i.e., equilibrium with optimal unified tax rate)[4] and GOETR-equilibrium (i.e., equilibrium with globally optimal enterprise tax rates)[5] to find that these two equilibria are very close. So the results show that the optimal unified tax rate of 21.82% is an efficient policy. At last, this paper performs the sensitivity analysis on the optimal unified enterprise tax rate with real enterprise tax rates for foreign invested enterprises and premium coefficient for managers in SOEs varying in arranged intervals. It shows the reliability of the conclusion given tax revenue.

The structure of this paper is as follows. We construct a general equilibrium model with production and consumption included in Section 2. Section 3 calibrates the parameters of production function and utility function based on the data set of China's economy in 2007. In Section 4 we investigate the optimal unified enterprise tax rate, and compare and analyze the equilibria of benchmark, of the unified enterprise tax rate of 25% and of the optimal unified enterprise tax rate. Sections 5 and 6 execute the sensitivity analysis as to enterprise tax rate for FIEs and premium coefficient, respectively. Section 7 concludes.

2. Basic model

The general equilibrium model will be set up on production economies. We consider a small open price taking economy with four sectors: agriculture, state-owned enterprises (SOEs), foreign investment enterprises (FIEs), and other private enterprises (OPEs). The world prices for the four goods are P_j^0 for $j = 0, 1, 2,$ and 3. Domestic prices are then given by world prices plus (or minus) the effect of ad valorem border measures for import tariffs as well as export subsidies, i.e.

$$P_j = \left(1+\tau_j\right)P_j^0, \quad j = 0,1,2, \text{ and } 3 \tag{2.1}$$

where τ_j for $j = 0, 1, 2,$ and 3 are agricultural and manufacturing import tariffs or export subsidies ($\tau_0 > 0$ indicates import tariffs for agricultural sector, and $\tau_j < 0$ indicates export subsidies for manufacturing sectors $j = 1, 2,$ and 3).

For the four sectors we assume the production function to be of the Cobb–Douglas form

$$Y_j = \phi_j L_j^{\alpha_j} K_j^{1-\alpha_j}, \quad j = 0,1,2, \text{ and } 3 \tag{2.2}$$

where Y_j is the output, L_j and K_j are the labor and capital (factor) inputs, respectively, ϕ_j is the units term (scalar parameter), and α_j is the production exponent.

For non-SOE sectors $j = 0, 2,$ and 3, the markets are fully competitive. The wage rate and the return of capital are determined by the marginal products with respect to labor and capital, respectively.

$$W_j = P_j\frac{\partial Y_j}{\partial L_j} = P_j\phi_j\alpha_j L_j^{\alpha_j-1}K_j^{1-\alpha_j} = \alpha_j\frac{P_jY_j}{L_j}, \quad j = 0,2, \text{ and } 3; \tag{2.3}$$

$$R_j = P_j\frac{\partial Y_j}{\partial K_j} = P_j\phi_j\left(1-\alpha_j\right)L_j^{\alpha_j}K_j^{-\alpha_j} = \left(1-\alpha_j\right)\frac{P_jY_j}{K_j}, \quad j = 0,2, \text{ and } 3. \tag{2.4}$$

In this case the zero-profit condition holds.

$$P_jY_j = W_jL_j + R_jK_j \quad j = 0,2, \text{ and } 3. \tag{2.5}$$

For the SOE sector, we assume that members in this sector face the wage W_1 which is fixed by policy. Besides wages paid to laborers, the SOE enterprises must pay the interest for the capital they receive from state banks. The profit they are entitled to is zero. This yields a budget constraint that the enterprise membership must meet,

$$P_1Y_1 = W_1L_1 + R_1K_1. \tag{2.6}$$

Given the economy we investigate on is a small open price taking one, the government can control the level of laborer's effort by

[3] The unified enterprise tax rate of 25% was executed for the three production sectors by the new Law on Corporate Income Tax from January 1, 2008.

[4] The equilibrium with optimal unified enterprise tax rate implies that the equal enterprise tax rates for the three production sectors ensure utility maximization in equilibrium.

[5] The equilibrium with globally optimal enterprise tax rates implies that the enterprise tax rates for the three production sectors attain the maximum utility value in equilibrium.