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Government budget, public-sector wages and capital taxes in a small open economy: A Hong Kong case ☆

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ABSTRACT

This paper examines the welfare implications of adjustments in public-sector wages and capital tax rates for a small open economy in a general equilibrium setting. The individually and jointly optimal wage and tax policies are derived and interpreted. Facing reductions in land sales and falls in foreign interest rates, a cut in public workers' pay is needed to make their wage comparable to the private sector and a hike in capital taxes is recommended for a budgetary consideration. Using a computable general equilibrium model for Hong Kong, we numerically evaluate the various optimal policies which not only confirm the theoretical results but also provide quantitative estimates of the optimal policy variables.

1. Introduction

In many countries, the wages and salaries of public-sector employees are institutionally set and hence less responsive to market situations compared to those of the private sector. Generally, during economic booms, public-sector wages may be lower than wages of the private sector and vice versa during the period of economic woe. In some countries, especially in developing nations, perhaps out of governmental concerns for political stability, public-sector employees receive higher wages than their counterparts in the private sector. During economic downturns, this can lead to a fiscal problem for the government in addition to inefficiency in the public sector. A vivid example is a case of Hong Kong in early 2000s in which the pay for government employees was higher than private-sector workers, and more than half of the government budget was made up for paying salaries and wages. During prosperous times, government spending can be financed by revenues collected from all sorts of taxes and public land leases in Hong Kong. However, during the recent years of economic downturns subsequent to the Asian financial crisis in 1997, shortfalls in government revenue have severely restricted government spending. In order to maintain a sound fiscal budgeting, the issues of cutting the wages of public-sector employees and instituting tax reforms for raising revenue had been implemented. Civil service pay was cut by 4.75% in October 2002 and another 6% cut was instituted in January 2004. Concomitantly, the corporate tax was increased by 1% from 16.5% to 17.5% in January 2004.[1]

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[1] The policy to raise tax in times of economic difficulties apparently runs contrary to the tax cut policy adopted in other countries. See The 2003–04 Budget, the Government of Hong Kong Special Administrative Region of the People's Republic of China (2002). http://www.budget.gov.hk/2003/eng/.

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The purpose of this paper is to examine the optimal wage structure for public and private sectors and the consequent tax reforms to finance public spending using Hong Kong as a case for study. Hong Kong's government revenue mainly consists of income taxes on individuals and companies (36.5% in 2002–03), capital revenues (24.5%) including land premium (11.6%), and other investment and recurrent revenues, while a large portion (66%) of government expenditure is on wages, salaries and social security payments.[2] In our theoretical model, we focus on government wage payments to its employees, who receive above-the-market salaries and wages. The financing of public expenditure is constrained by the revenues from capital taxes and land sales/leases.[3] We will show that the optimal policy involves elimination of the inter-sectoral wage gap so that public-sector wages will be lowered and in line with private-sector wages. This will be coupled with an optimal capital tax rate, which depends on (i) the factors pertinent to revenue generation for the government, e.g. amount of available capital and land leases, and (ii) the attributes of the public good reflected by consumer's valuation of the public good and its production cost. Furthermore, the optimal capital tax rate can be affected by some external shocks, for example, changes in either land leases or world interest rates.

The above theoretical analysis is supplemented with numerical simulation results from a computable general equilibrium (CGE) model specifically developed for tackling the issues of optimal public pay, capital taxes, and external shocks. Using a data set for Hong Kong, the CGE model is deployed to numerically evaluate the optimal policies and to derive the needed adjustment to the optimal policies in responding to external shocks. These results will be used to verify the validity of the theoretical propositions of the paper. The model also provides numerical estimates that may be useful for policy-making.

This paper is organized as follows. Section 2 sketches a three-sector general equilibrium model. Section 3 examines the welfare effects of adjustments in public-sector wages and capital taxes. Furthermore, the individually and jointly optimal wages and capital tax rates will be derived. Section 4 studies the impact of an exogenous change in each of the several external shocks on the jointly optimal policies. Section 5 lays out the structure of the CGE model and describes the data set used for numerical simulations. Section 6 reports simulation results on the optimal policies and the changes in the optimal policies in responding to various external shocks. Some concluding remarks are provided in Section 7.

2. The theoretical model

Consider a small open economy that consists of two private sectors, X and Y, and a public sector, g. Private goods are traded internationally, whereas the public good is not. We assume that the economy exports good X and imports good Y. The former can be considered as manufactures and services while the latter is agricultural commodity. To simplify the analysis, the production of good Y requires labor only: $Y=Y(L_Y)$. On the other hand, good X is produced by using labor (L_X) and capital (K) together with a commercial land-related factor (S) such as office or factory space: $X=X(L_X, K, S)$. Commercial land is supplied by the government, and capital is owned by domestic and foreign investors, i.e., $K=K_d+K_f$. Both productions of goods X and Y are under constant returns to scale. Similar to good Y, the production of the public good, g, needs labor only with a non-increasing returns-to-scale technology: $g=L_g^{\beta}$, where $0<\beta\leq 1$.

Choosing good Y as the numeraire, the domestic price of good X is given by the world price p and the returns to labor, capital and land in the private sectors are denoted by w, r and v, respectively. The unit cost functions for goods X and Y are therefore: $c^X(w, r, v)$ and $c^Y(w)$. Under perfectly competitive equilibrium, factor and goods prices are linked by the zero-profit conditions: $c^X(w, r, v)=p$ and $c^Y(w)=1$. The latter results in a constant wage rate w for the private sectors. Furthermore, capital in sector X is internationally mobile. This gives the equalization of capital returns between countries: $r=r^*+\tau$, where r^* denotes the given foreign rate of capital returns and τ is the domestic tax on capital.[4] Hence, the land rent is a function of the good price and the capital rental, i.e., $v=v(p, r)$, where $v_p>0$ and $v_r<0$.[5] Finally, the institutionally set wage rate in the public sector, $\overline{w}$, is assumed to be higher than the private-sector wage rate, i.e., $\overline{w}>w$.[6] To reduce public-sector costs, the government imposes a pay cut on public wages by an amount of α. The *actual* public wage rate becomes: $\overline{w}-\alpha$.

The above mentioned supply-side information can be captured by the revenue function of the two private sectors: $R(p, K, S, g)=\max\{pX(L_X, K, S)+Y(L_Y): L_X+L_Y=L-g\}$, where L is the domestic labor endowment. Letting subscripts in the revenue function be partial derivatives, we have $R_g=-wL_g^{1-\beta}/\beta<0$ and $-R_g$ expresses marginal cost of providing the public good. Because w is a constant, we obtain: $R_{gK}=0$. In addition, since the supply price of capital that domestic and foreign investors face is $r^*+\tau$, we have: $R_K=r^*+\tau$.

As for the demand side of the economy, a government-provided public good, in addition to the two private goods, is available to consumers. Consumer i minimizes the spending on private goods X and Y, denoted by C_X^i and C_Y^i, subject to a given level of utility u^i and supply of the public good g, where $i=1, \ldots, L$. It is assumed that every individual has a quasi-linear utility function, i.e., $U^i(C_X^i, C_Y^i, g)=\varphi(C_X^i)+C_Y^i+h(g)$, where $\varphi'(\ldots)>0$ and $h'(\ldots)>0$. This gives rise to the individual expenditure function: $E^i(p, g, u^i)=pC_X^i(p)+u^i-\varphi(C_X^i(p))-h(g)$. Following Feenstra (2004, p. 213), the aggregate expenditure function is then the sum of L individual

[2] *Ibid.*

[3] There is a substantial literature on the mix of taxes to finance public goods. For example, tariffs and consumption taxes are used in Michael, Hatzipanayotou, and Miller (1993) and income taxes and consumption taxes are considered in Michael and Hatzipanayotou (2001).

[4] Since the wage and capital rental rates are given in this small open economy, an additional factor such as land with an endogenous input price is necessary to ensure unit cost $c^X(w, r, v)$ equal to the output price p under perfect competition. See Jones (1971) for discussions on the properties of the general, specific-factor model.

[5] Namely, $v_p\ (=\partial v/\partial p)=1/c_p^X>0$ and $v_r\ (=\partial v/\partial r)=-c_r^X/c_v^X<0$.

[6] Studies on sectoral wage differentials can be found, for example, in Batra and Scully (1971) and Khan (1982). A special case of sectoral wage differentials is the Harris and Todaro (1970) model, in which sectoral unemployment is allowed. See Beladi and Marjit (1992) and Gupta (1995) for recent studies.