Tax harmonisation and the origin principle

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Abstract

The purpose of this paper is to discuss whether a tax harmonisation based on the origin principle can be actual Pareto-improvement (\textit{API}) and potential Pareto-improving (\textit{PPI}) in the presence of public good provision. We show that there are situations in which some tax harmonisation leads to \textit{API} and \textit{PPI}. In such cases, tax harmonisation converges towards the optimal tax and leads to the \textit{API}. For instance, in a two-country framework, if the foreign country has an initial level of distortion higher than the home country around the optimal tax, its initial tax rate must be lower (higher) than home country in order to obtain a \textit{PPI}. © 2001 Elsevier Science B.V. All rights reserved.

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1. Introduction

The destination principle implies that the international traded commodities are taxed at the rates of the country in which final consumption takes place. Since this principle prevents countries from adopting distorting tax systems, many countries around the world have used it and many international agreements concerning trade recommend this principle. Furthermore, the destination principle, in the absence of barriers and/or controls, guarantees a neutral effect of tax on competition. In terms of tax frauds this principle requires efficient border monitoring. For instance, since border controls are not perfect and increasing direct consumer purchases such as mail order firms, Internet, the inefficiency of the tax destination principle has augmented. In opposite, there is the origin principle, under which commodities are taxed at the rates prevailing in the country where they are produced.

principle and allow for the possibility of transfers between countries. Also using destination tax base, Delipalla (1997); Lockwood (1997); Lahiri and Raimondos (1998) assume that governments levy this kind of tax to finance the public good provision. Otherwise, Lopez-Garcia (1996) considers the origin principle, but only analysing the existence of transfers. Assuming uniformity of taxes within each country Lockwood et al. (1994) show the equivalence between the destination principle and the origin principle. The purpose of this paper is to fill this gap in the literature by allowing for the possibility of a harmonising tax reform, based on the origin principle, where the government uses its tax revenue to finance the provision of public good.

2. The model

The framework of this model follows Lahiri and Raimondos (1998), i.e., a model with two countries, the home country with its variables represented by lower case letters and the foreign country with its variables represented by upper case letters. Each country has one representative consumer, \(N + 1\) tradeable private goods, one non-tradeable public good. These commodity and factor markets are perfectly competitive. We suppose the absence of transport cost such that the only distortions in trade are due to consumption taxes levied on the origin principle. Hence, the consumer price is the same in both countries (\(q = Q\)) and the producer price is \(p = q - t\) and \(P = q - T\), where \((t, T)\) are the tax rates in each country. The representative consumer in each country is represented by expenditure functions \(e(q, g, u)\) and \(E(q, G, U)\), respectively, where \((g, G)\) are the public good provision and \((u, U)\) the utility level of consumers in each country. The production sector behaves competitively with revenue functions \([r(p, g), R(P, G)]\). The consumers’ budget constraints are

\[
e(q, g, u) = r(p, g) + t'r_p(p, g) - B \tag{1}
\]

\[
E(q, G, U) = R(P, G) + T'R_p(P, G) + B. \tag{2}
\]

They show that the consumer’s expenditure equals the revenue in the private sector and the public sector, i.e., the budget constraints of private sector in each country. To finance her expenditure the consumer uses the income generated from private and public sector. The budget constraints of governments of home and foreign country are

\[
t'r_p(p, g) - B = - g r_g \tag{3}
\]

\[
T'R_p(P, G) + B = - G R_G \tag{4}
\]

respectively. These equations show how the government can finance the public provision good, i.e., the public sector budget constraint. As it is usually done in the literature of tax harmonisation, we abstract from all income effects \((e_{gu} = E_{gU} = 0)\) and assume that the supply of private goods is not affected by public good provision \((r_{pg} = R_{pg} = 0)\). Considering also \(p = q - t\) and \(P = q - T\) perturbations over \((1)\)–\((4)\) become

\[
e_u du = - mdq - s_g dg + t'r_{pg}dt - dB \tag{5}
\]

\[
r_g dg = - (t'r_{pp} - gr_{gp})dq - (r_p + t'r_{pp} + gr_{gp})dt + dB \tag{6}
\]
\[ E_qdU = -Mdq - S_qdG + T'R_{pp}dT + dB \]  
(7)

\[ R_gdG = - (T'R_{pp} - GR_{gp})dq - (R_p + T'R_{pp} + GR_{gp})dT - dB \]  
(8)

where \( m = e_q - r_p \) and \( M = E_q - R_p \) are the vectors of imported goods for the home and foreign countries, respectively; and we define \( s_q = e_q - r_q \) and \( S_q = E_q - R_q \) for notational simplicity. Observe that when \( s_q = S_q = 0 \), i.e., \( -e_q = -r_q \) and \( -E_q = -R_q \), respectively, we have the so-called Samuelson rule for optimal public good provision. Eqs. (5) and (7) characterize the welfare consequences of tax changes. On the right hand side, the first term is the terms-of-trade effect, the second term is the influence of public good provision on welfare, the third effect is change in the deadweight loss due to the existence of distortionary taxes and the fourth effect is the direct effect of the international transfer. Eqs. (6) and (8) are changes in the public good provision in each country. Substituting \( dg \) of (6) in (5) and \( dG \) of (8) in (7), we directly obtain the welfare effects of changes in the policy instruments, taxes and international transfer in respective countries, as follows:

\[ e_qdu = \left( t'_{pp} + \frac{s_q}{r_q}gr_{gp} - m \right)dq - \left( t'_{pp} + \frac{s_q}{r_q}gr_{gp} - \frac{s_q}{r_p} \right)dt - \theta dB \]  
(9)

\[ E_qdU = \left( T'R_{pp}\theta + \frac{S_G}{R_G}GR_{gp} - M \right)dq - \left( T'R_{pp}\theta + \frac{S_G}{R_G}GR_{gp} - \frac{S_G}{R_p}R_p \right)dT + \theta dB \]  
(10)

where \( \theta = 1 + s_q/r_r = e_q/r_r > 0 \) for the home country, with \( \theta^* \) defined similarly for the foreign country. Observe that the terms in brackets represent the effect of distortionary taxes on the supply of the non-numeraire goods, where the first terms \( (r_{pp}, R_{pp}) \) represent the direct effect substitution and the second term is the indirect effect via the public goods sector. We can analyse the welfare effects in these small economies via changes in the provision of the public goods. Then, setting \( dB = 0 \) and \( du/dt = dU/dT = 0 \) we can get the optimal tax levels as

\[ t'^* = \frac{s_q(r_p - gr_{gp})}{e_q}t_{pp}^{-1} \]  
(11)

\[ T'^* = \frac{S_G(R_p - GR_{gp})}{E_G}R_{pp}^{-1} \]  
(12)

Observe that the optimal public good provision rule in the home country is \( -e_q(r_p - gr_{gp}) + t'_{pp} \), i.e., in the presence of distortionary tax the MRS \( (= -e_q) \) is adjusted by the distortionary effect. The consumers can be less willing to pay for the public good in the presence of distortion tax. Considering \( \Phi = (r_p - gr_{gp} - t'_{pp}) \) as the individual marginal utility of income and \( \Gamma = (r_p - gr_{gp}) \) as the social marginal cost of raising revenue we have \( \Phi/\Gamma \) MRS = MRT.
2.1. Actual Pareto-improvement (API)

In search for an API we should define $B = 0$ in (9) and analyse the $(q,u,U,g,G)$ take as given the tax parameters $t$ and $T$. Considering one tax reform that converges towards the optimal tax rate obtained in (11) of the form $dt = -\beta(t - t^*)$, we can obtain the following relation for the home country as

$$e_u du = -r_{pp} e_g B(t^* - t)(t - t^*) > 0$$

((13))

with similar manipulations to the foreign country. Observe that these reform are API.

2.2. Potential pareto-improvement (PPI)

Now, we take as given the tax parameters and holding $U$ constant to analyse $(q,u,g,G,B)$ and the possibility of a PPI. Considering (11), $dU = 0$ in (10) and doing a transfer $dB$ we get

$$r_g e_u du = (t^* - t)'r_{pp} dt + (T^* - T)'R_{pp}dT.$$

(14)

Consider now a harmonising tax reform towards a common $H$, as $dt = \beta(H - t)$ where $H = Kt + (I - K)T$ is a weighted average of tax structures in the two countries whose weights depend on local supply responses. $\beta$ is a scalar that measures the size of the reform and $K = r_{pp}(r_{pp} + R_{pp})^{-1}$ is a positive definite matrix because its components are positive definite. Besides considering the local supply responses this harmonising tax reform leads to an average of pre-existing tax structure. This tax reform in the welfare equation of home country (14) gives us

$$r_g e_u du = \frac{r_{pp}R_{pp}}{r_{pp} + R_{pp}}(T - t)'[(t^* - t)' - (T^* - T)'].$$

(15)

Observe this commodity tax harmonisation is PPI if $T \geq t$ and $(T^* - T)' \geq (t^* - t)'$. The intuition is as follows. If the foreign country has an initial level of distortion higher than the home country, an origin based tax harmonisation requires its initial tax rate of all commodities to be lower than in the home country in order to yield a PPI. Otherwise, if the home country has a higher initial level of distortion, its initial tax rate of all goods should be lower than that of the foreign country in order to yield a PPI.

3. Conclusion

In this paper we show that a tax harmonisation based on the origin principle can also generate both API and PPI. Whereas the former is an intuitive result, the last requires a specific assumption to be reached. If the foreign country initially has a higher (lower) level of distortion around the optimal tax, its initial tax rate must be set at a lower (higher) level than that of the home one in order to obtain a PPI. To get this harmonising tax reform we consider the traditional assumptions except that we do not need a uniform tax rate. Therefore the tax rates levied on all of the goods of a country need to be
higher (lower) than the rates levied on the goods of the other country. Some characteristics of the economy as the factor supply changes, the changes in technologies, the factor movements and the tariff revenue could be analysed but we leave them for future research.

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References