Received: 14 June 2021 | Accepted: 15 June 2021

DOI: 10.1111/jpet.12535

ORIGINAL ARTICLE

JOURNAL OF PUBLIC ECONOMIC THEORY WILEY

On commodity tax harmonization and public goods provision

Christos Kotsogiannis[1,2] | **Miguel-Angel Lopez-Garcia**[3]

[1]Department of Economics, Tax Administration Research Center (TARC), University of Exeter Business School, Exeter, England, UK

[2]CESIfo, Munich, Germany

[3]Departamento de Economia Aplicada, Universidad Autonoma de Barcelona, Bellaterra, Barcelona, Spain

Correspondence
Miguel-Angel Lopez-Garcia, Departamento de Economia Aplicada, Universidad Autonoma de Barcelona, 08193 Bellaterra, Barcelona, Spain.
Email: miguelangel.lopez@uab.cat

Funding information
Spanish Ministry of Science, Innovation and Universities, Grant/Award Number: RTI2018-095799-B-I00; Economic and Social Research Council, Grant/Award Number: ES/S00713X/1

Abstract

This paper argues that Pareto improvements based on harmonizing tax reforms expressed in terms of the divergence between actual and optimal tax structures and over/under provision of public goods require the use of 'pseudo-optimal' taxes instead of optimal ones. 'Pseudo-optimal' taxes are defined as those obtained using the optimal tax formulas but evaluated at any arbitrary initial tax structure. Within this context the paper reconfirms existing results showing that tax harmonization emerges as a strong policy instrument in achieving a potential Pareto-improvement.

1 | INTRODUCTION

Indirect tax harmonization has received considerable attention in the academic literature and policy domain over the last two decades or so. Much of the literature has focused on the desirability of reforms (when tax revenues are returned to the consumer in a lump-sum fashion or they are used to finance public goods), with the common theme emerging being that a multilateral tax reform consisting of a move towards an appropriately weighted tax generates a potential Pareto improvement (in the sense that at least one of the tax-harmonizing countries strictly gains and none lose). An actual Pareto improvement, where all participating countries strictly gain in welfare as a consequence of the harmonizing reform, is more difficult to be achieved (Keen, 1987, 1989; Turunen-Red & Woodland, 1990).[1]

The availability of instruments, relative to the number of margins, tax harmonization is required to correct of course matters. The initial contributions dealing with the welfare effects of tax harmonization assumed, somewhat unrealistically, that tax revenues are returned to the representative consumer in each country in a lump-sum fashion, thereby bypassing the welfare implications of the reform if revenues were to be allocated through public good expenditure. Intuition suggests that incorporating public good expenditure as an additional (and welfare) margin requires the availability of an additional (to tax harmonization) instrument (see, Delipalla, 1997; Karakosta et al., 2014; Keen et al., 2002; Kotsogiannis & Lopez-Garcia, 2007; Kotsogiannis et al., 2005; Lahiri & Raimondos-Moller, 1998; Lockwood, 1997; Lopez-Garcia, 1996, 1998; Lucas, 2001; among others). The reason for this is that tax harmonization is not sufficient, by way of design, to deal with two margins: one arising from inefficiencies in either production or consumption[2] and one arising from the intensity of preferences for public goods.

The contribution of this paper is in recognizing that evaluating tax-harmonizing reforms in terms of divergence between actual and optimal tax structures (as in the early and insightful contribution by Lahiri & Raimondos-Moller, 1998) requires a more accurate definition of the target taxes: These taxes will be conveniently called ‘pseudo-optimal’ taxes and are obtained using the *optimal* tax formulas evaluated at any *arbitrary* initial tax structure. This recognition, inevitably, necessitates the analysis to revisit, and recast, the well-known results in the contribution of Lahiri and Raimondos-Moller (1998).

The paper proceeds as follows. Section 2 presents a standard general equilibrium model of international trade where governments levy destination-based taxes and provide public goods whose supply benefits solely the resident of the country providing it.[3] Section 3 reviews Lahiri and Raimondos-Moller (1998), who focus on Pareto-improving tax-harmonizing reforms that are based on the divergence between actual and optimal taxes and over/under provision of national public goods, and recasts these results by evaluating the reforms at particular tax structures (those that utilize ‘pseudo-optimal’ taxes). Section 4 briefly concludes.

2 | THE MODEL

The analysis is developed within a standard general equilibrium two-country competitive trade model where governments levy destination-based taxes and revenue is used to provide a national public good that is, a public good whose supply benefits solely the resident of the country providing it. The two countries are labeled ‘home’ and ‘foreign,’ and variables pertaining to the

[1]This welfare criterion is standard in the literature and reflects that in tax matters tax reforms typically require unanimity. There are, of course, other forms of harmonization: one possibility is the harmonization of some policy parameters (rate and base), whereas another one is when countries set tax policy parameters independently, and rely primarily on exchange of information to resolve issues related to the taxation of intra-community trade.

[2]And either, depending upon the tax system in place, tax principles: destination (commodities are taxed by, and revenues accrue to, the country which consumption takes place) or origin (commodities are taxed by, and revenues accrue to, the country that produces the goods).

[3]Kotsogiannis and Lopez-Garcia (2021) discuss the case in which public goods are global in the sense that the enjoyment of the good by the home (foreign) country resident does not diminish its availability for the citizen in the foreign (home) country.

home and foreign country are denoted by lower- and upper-case letters, respectively. There is a private sector in each country producing $N + 1$ tradeable commodities under constant returns to scale, and a public sector which produces a nontradeable public good g (G). Destination-based taxes imply that commodities are taxed by the country where final consumption takes place, this being the one receiving the ensuing tax revenues. Following Lahiri and Raimondos-Moller (1998), international producer prices are assumed to be constant and commodity taxes (over the nonnuméraire good) are assumed to be uniform.

In the home (foreign) country there is a single representative consumer with preferences described by an expenditure function $e(q, g, u)$ $(E(q, G, U))$ for the home (foreign) country, where q (Q) is the $N + 1$-vector of consumer prices of the private goods and u (U) is the utility of the consumer.[4] The vector of compensated demands in the home (foreign) country is given by e_q (E_Q),[5] and $-e_g > 0$ $(-E_G > 0)$ gives the marginal willingness to pay for $g(G)$ by the home (foreign) consumer.

The private sector is competitive and characterized by a 'restricted revenue function' (or 'restricted gross national product [GNP] function') denoted by $r(p, g)$ $(R(p, G))$ for the home (foreign) country. The vector of supplies in the home (foreign) country is given by r_p (R_p), and the scalar $r_g < 0$ $(R_G < 0)$ gives the reduction in the home (foreign) country's production of the tradeable goods—and so revenues $r(p, g)$ $(R(p, G))$—as a consequence of an increase in the production of the national public good. Public goods g and G are produced with technology that exhibits constant returns to scale, implying that the marginal cost of production is given by $-r_g > 0$ $(-R_G > 0)$.[6]

Denoting the destination-based commodity tax-vector in the home country by t and in the foreign one by T, the consumer price-vector is given by $q = p + t$ for the home country and $Q = p + T$ for the foreign one. The homogeneity properties of the above-mentioned functions in the variables q, Q, and p, imply that, without loss of generality, we can take the first tradeable commodity, good 0, to be the numéraire and also to be the untaxed commodity in both countries, so that $p_0 = q_0 = Q_0 = 1$. With uniform taxes over the nonnuméraire goods, we can write $t = \tau 1$ and $T = \mathcal{T} 1$, where τ and $\mathcal{T}$ are scalars and 1 is the N-column vector of 1's. We can also notice in passing that with constant world producer prices, the assumption of constant returns to scale entails that these prices can be normalized to be unity for all the $N + 1$ commodities. To do so, physical units have only to be 're-scaled,' so that if p_i is the producer price of a physical unit of commodity i, $1/p_i$ units will have a price equal to one. With this transformation, commodity taxation can be interpreted either as per unit or ad valorem

[4]For the home country, the expenditure function is the solution of $e(q, g, u) \equiv \min_x\{q'x \mid \hat{u}(x, g) \geq u\}$, where x is the consumption vector of the $N + 1$ private goods and $\hat{u}(\cdot)$ is the utility function.

[5]All vectors are column vectors, with a prime ($'$) indicating transposition. A subscript denotes differentiation.

[6]As discussed in Abe (1992), the 'restricted revenue function' embeds all the usual properties of technology. As far as the private goods are concerned (and focusing on the home country), the standard GNP function is the solution of $r^*(p, v^p) \equiv \max_y\{p'y \mid y \in F(v^p)\}$, where y is the production vector of the $N + 1$ private goods, v^p is the vector of the M factors of production available in the private sector and $F(\cdot)$ is the private production possibility set. From well-known properties, $r^*_{v^p}(p, v^p) = w$, where w is the factor price-vector. With respect to public production, g is produced under constant returns to scale by means of the vector of production factors v^g. Full employment of the production factors v (assumed to be internationally immobile) implies $v^p + v^g = v$, which allows to write v^p as a function $v^p(p, g)$. The restricted GNP function can then be found as $r(p, g) = r^*[p, v^p(p, g)]$. Assuming that $r^*_{v^p v^p} = 0_{M\times M}$ (and so factor prices w are unaffected by the change in the factor endowments available for the private sectors, Abe, 1992, p. 213), it can be shown that $r_p(p, g) = r^*_p(p, v^p)$ and that $-r_g(p, g)$ equals the marginal cost of providing g. The implication of the latter is that the marginal cost $-r_g$ is constant.

taxation based on world producer prices. Focusing on the home country, consumer prices become $q = 1 + \tau 1 = (1 + \tau)1$. On the other hand, ad valorem taxation at rate θ gives rise to consumer prices $q = (1 + \theta)1$ which amounts to the previous case when $\theta = \tau$.

For notational simplicity, p will continue to denote world producer prices, but the results below can be interpreted both in terms of unit or ad valorem taxation. The framework also allows for the existence of international transfers, denoted by z, from the foreign country to the home one.[7] The role of these transfers between governments will be to ensure that the welfare of the foreign country is kept constant after any tax reform (and so characterize a potential Pareto-improvement).

An equilibrium for this economy is a set of values for the endogenous variables—utilities u, U, and national public goods, g, G—that satisfy the budget constraints of the consumers and governments, given the scalar tax rates, τ, $\mathcal{T}$, and the international transfer between governments, z. The system of equations that characterizes the equilibrium is given by[8]

$$e(p + \tau 1, g, u) = r(p, g) + \tau 1' e_q(p + \tau 1, g, u) + z, \tag{1}$$

$$E(p + \mathcal{T}1, G, U) = R(p, G) + \mathcal{T}1' E_Q(p + \mathcal{T}1, G, U) - z, \tag{2}$$

$$\tau 1' e_q(p + \tau 1, g, u) + z = -g r_g(p, g), \tag{3}$$

$$\mathcal{T}1' E_Q(p + \mathcal{T}1, G, U) - z = -G R_G(p, G). \tag{4}$$

Equation (1) gives the home country consumer's budget constraint: It simply states that, in equilibrium, the minimum expenditure of the home consumer to achieve utility u is equal to the sum of the income generated by the production of the tradeable goods, $r(p, g)$, and the payment to factors employed in the public sector (which, in turn, are the revenues generated by taxing own demand, given by $\tau 1' e_q$, and the international transfer z). A similar interpretation applies to the budget constraint of the foreign consumer in Equation (2). Equations (3) and (4) give the home and foreign country government budget constraints, respectively.

The analysis will now proceed by considering perturbations of the system (1)–(4), identifying tax reforms $\{d\tau, d\mathcal{T}, dz\}$ that generate a potential Pareto improvement of the form $du > 0, dU = 0$. In doing so, it will be assumed that $e_{qu} = E_{QU} = 0$ (where 0 is the N-column vector of 0's) meaning that in each country income effects attach only to the untaxed numéraire commodity, good 0.[9] It will also be assumed that public good provision does not affect the compensated demands for, and the supplies of, any good other than the numéraire, and so $e_{qk} = E_{Qk} = r_{pk} = R_{pk} = 0$, $k = g, G$ (0 being the N-column vector of 0's).[10]

[7] z can be thought of as a transfer of the numéraire good, whose international price is 1. This good sold at the international market will appear as additional income (and so expenditure) for the receiving country.

[8] As already noted, to model public good production the analysis follows Abe (1992). An alternative specification is to assume, following Keen and Wildasin (2004), that the government purchases the numéraire good and (as, it will be clear shortly below, it is assumed here) the public good use of this good does not affect the compensated demands for, or the supplies of, the nonnuméraire goods. Adopting the present specification the analysis focuses both on the spending side and public good production.

[9] This is a common assumption in the analysis of optimal commodity taxes and tax reforms. See, for example, Keen (1989) and Keen and Wildasin (2004).

[10] Standard properties of the expenditure function $e(\cdot)$ (and $E(\cdot)$) imply that the $(N + 1) \times (N + 1)$ matrix of substitution effects (including the untaxed numéraire good) is negative semidefinite. It will further be assumed that there is enough substitutability between the numéraire good and all other goods so that the $N \times N$ matrices e_{qq} and E_{QQ} are negative definite. See Dixit and Norman (1980) and Woodland (1982).

3 | PARETO REFORMS AND 'PSEUDO-OPTIMAL' TAXES

Perturbing (1)–(4), the welfare effects $\{du, dU\}$ following tax changes $\{d\tau, d\mathcal{T}, dz\}$ can be written as

$$\frac{r_g}{e_g} e_u du = \left(\tau 1' e_{qq} 1 + \frac{(e_g - r_g)}{e_g} e_q' 1 \right) d\tau + dz, \tag{5}$$

$$\frac{R_G}{E_G} E_U dU = \left(\mathcal{T} 1' E_{QQ} 1 + \frac{(E_G - R_G)}{E_G} E_Q' 1 \right) d\mathcal{T} - dz, \tag{6}$$

where $e_u > 0$ ($E_U > 0$) is the reciprocal of the marginal utility of income of the consumer residing in the home (foreign) country. Notice that (5) and (6) characterize, for an arbitrary value of the international transfer z, the optimal tax levels under the constraint that they are uniform over the nonnuméraire commodities. These taxes, denoted by τ^* for the home country and $\mathcal{T}^*$ for the foreign one, are given by

$$\tau^* = -\frac{\left(e_g^* - r_g\right)}{e_g^*} \frac{e_q^{*'} 1}{1' e_{qq}^* 1}, \quad \mathcal{T}^* = -\frac{\left(E_G^* - R_G\right)}{E_G^*} \frac{E_Q^{*'} 1}{1' E_{QQ}^* 1}, \tag{7}$$

where all the relevant variables[11] are evaluated at their optimal values, denoted by an (*), given a value of the transfer z. We turn to this shortly below.

Equation (6), for $dU = 0$, relates dz to $d\mathcal{T}$ which when substituted into (5) gives the change in the home country's utility given by

$$\frac{r_g}{e_g} e_u du \mid_{dU=0} = \left(\tau 1' e_{qq} 1 + \frac{(e_g - r_g)}{e_g} e_q' 1 \right) d\tau + \left(\mathcal{T} 1' E_{QQ} 1 + \frac{(E_G - R_G)}{E_G} E_Q' 1 \right) d\mathcal{T}. \tag{8}$$

A commonly studied reform[12] takes the form of a uniform convergence of the type

$$d\tau = \beta(h - \tau), \quad d\mathcal{T} = \beta(h - \mathcal{T}), \tag{9}$$

where β is a small positive number and h (a weighted average of the tax structures τ and $\mathcal{T}$) is the target tax towards which the domestic tax structures converge, and given by

$$h = k\tau + (1 - k)\mathcal{T}. \tag{10}$$

The choice of $k \in (0, 1)$ (see Lahiri & Raimondos-Moller, 1998 and, in particular, Propositions 1–3 on pp. 263–264) captures the extent to which both countries over-supply the national public good, both undersupply it, and one of them under- and the other over-supplies the public good. 'Over/under'-supply is expressed in terms of $\tau(\mathcal{T})$ being greater/less than $\tau^*(\mathcal{T}^*)$ in Equation (7).

It is tempting to use optimal taxes τ^* and $\mathcal{T}^*$ in Equation (7) to express Equation (8) as[13] the change in utility in terms of divergences between actual and optimal taxes, $(\tau - \tau^*)$ and $(\mathcal{T} - \mathcal{T}^*)$, that is,

[11] With the exception of r_g and R_G which, as noted earlier, are constants.
[12] And the one analyzed in Lahiri and Raimondos-Moller (1998).
[13] As Lahiri and Raimondos-Moller (1998) do on p. 260 and in eq. (13).

$$\frac{r_g}{e_g} e_u du \mid_{dU=0} = (\tau - \tau^*) 1' e_{qq} 1 d\tau + (\mathcal{T} - \mathcal{T}^*) 1' E_{QQ} 1 d\mathcal{T}. \tag{11}$$

But this would be problematic: The reason for this being that, as shown by (7), optimal taxes τ^* and $\mathcal{T}^*$ embody compensated demands (e_q^*, E_Q^*), local demand responses (e_{qq}^*, E_{QQ}^*), and marginal valuations for the national public goods $(-e_g^*, -E_G^*)$, that are all evaluated at the *optimal* configuration. However, their counterparts in Equation (8) are associated with *arbitrary* (e_q, E_Q), (e_{qq}, E_{QQ}), and $(-e_g, -E_G)$.

It is worth elaborating more on the point made in the preceding paragraph. With fixed international producer prices, the system of Equations (1)–(4) implies that optimal taxes can be implicitly characterized as[14]

$$\tau^* = \psi(\tau^*), \quad \mathcal{T}^* = \Psi(\mathcal{T}^*). \tag{12}$$

The important point to emphasize here is that the functions $\psi(\cdot)$ and $\Psi(\cdot)$ in (12) can be evaluated for any *arbitrary* initial tax structure, thus defining '*pseudo-optimal*' taxes given by

$$\psi(\tau) = -\frac{(e_g - r_g)}{e_g} \frac{e_q' 1}{1' e_{qq} 1}, \quad \Psi(\mathcal{T}) = -\frac{(E_G - R_G)}{E_G} \frac{E_Q' 1}{1' E_{QQ} 1}, \tag{13}$$

and they are obtained using optimal tax formulas but computed for any arbitrary tax structure. Although optimal taxes and 'pseudo-optimal' taxes have the same functional form, the compensated demands, local demand responses and marginal valuations for the public goods in (7) and (13) will in general be different. This is, arguably, a subtle but important point.

What the above discussion points to is that welfare evaluation requires that (11) is replaced with

$$\frac{r_g}{e_g} e_u du \mid_{dU=0} = [\tau - \psi(\tau)] 1' e_{qq} 1 d\tau + [\mathcal{T} - \Psi(\mathcal{T})] 1' E_{QQ} 1 d\mathcal{T}. \tag{14}$$

From a policy perspective the question then is: Do the tax-harmonizing reforms analyzed in Lahiri and Raimondos-Moller (1998) still deliver a potential Pareto improvement? The answer to this is in the affirmative if, starting from (14), an appropriate interpretation of the reforms in (9) and (10) is adopted as follows: First, optimal taxes τ^* and T^* are replaced with 'pseudo-optimal' ones, $\psi(\tau)$ and $\Psi(\mathcal{T})$ and, second, over- or under-supply of public goods (i.e., $\tau(T)$ being greater or less than $\tau^*(T^*)$) are reformulated in terms of pre-existing taxes, $\tau(T)$, being greater or less than 'pseudo-optimal' ones $\psi(\tau)(\Psi(\mathcal{T}))$.

As one would expect, local demand responses will be taken into account in the choice of the weights k in (10). But, importantly, the precise value of k will also depend on the sign of the divergence $[\tau - \psi(\tau)]$ and $[\mathcal{T} - \Psi(\mathcal{T})]$. Applying this reasoning to the three cases considered in Propositions 1–3 in Lahiri and Raimondos-Moller (1998) requires that Proposition 1 (p. 263) is restated in terms of τ and $\mathcal{T}$ being greater than $\psi(\tau)$ and $\Psi(\mathcal{T})$, respectively, and k takes the value of

[14]To see this consider the home country. For this country, and for given z, Equations (1) and (3) implicitly determine $\tau = \tau(g, u, z)$ and $g = g(\tau, u, z)$. Substituting the latter into the former gives $\tau = \tau[g(\tau, u, z), u, z] \equiv \varphi(\tau, u, z)$, which, again for fixed z, is a function relating u to τ. It then follows that $d\tau = \varphi_\tau d\tau + \varphi_u du$. Thus, the expression $du/d\tau = (1 - \varphi_\tau)/\varphi_u = 0$ characterizes the optimal τ and so $\tau^* = \psi(\tau^*)$ in Equation (7) (or 12). Similar considerations apply to Equations (2) and (4) for the foreign country.

$$k = \frac{\omega 1' e_{qq} 1}{\omega 1' e_{qq} 1 + \Omega 1' E_{QQ} 1}, \tag{15}$$

where $\omega = 1 - \psi(\tau)/\tau$ and $\Omega = 1 - \Psi(\mathcal{T})/T$. By the same token, in Proposition 2, where $\tau < \psi(\tau)$ and $T < \Psi(\mathcal{T})$, k in (10) takes the value of

$$k = \frac{\sigma 1' e_{qq} 1}{\sigma 1' e_{qq} 1 + \Sigma 1' E_{QQ} 1}, \tag{16}$$

where $\sigma = (\tau - \psi(\tau)/\mathcal{T}$ and $\Sigma = \mathcal{T} - \Psi(\mathcal{T})/\tau$. And, finally, in the counterpart of Proposition 3, where $\tau > \psi(\tau)$ and $\mathcal{T} < \Psi(\mathcal{T})$, the required value of k is

$$k = \frac{\sigma 1' e_{qq} 1}{\sigma 1' e_{qq} 1 - \Sigma 1' E_{QQ} 1}. \tag{17}$$

Summarizing the above discussion:

Proposition 1. *When governments provide public goods, with fixed international producer prices and uniform (per unit or ad valorem) commodity taxes, the tax-harmonizing reforms (9) and (10) deliver a potential Pareto improvement (in the sense that $du > 0$ ($dU = 0$) in Equation 14), when 'pseudo-optimal' taxes, $\psi(\tau)$ and $\Psi(\mathcal{T})$ are used, and over- or under-supply of public goods is appropriately reformulated in terms of pre-existing taxes, τ and $\mathcal{T}$, being greater or less than those 'pseudo-optimal' ones.*

4 | CONCLUDING REMARKS

This paper has discussed the existence of global welfare gains as a consequence of the implementation of multilateral harmonizing reforms of the indirect tax structures of two countries in the presence of public goods provision. The framework has been a standard general equilibrium model of international trade where governments levy destination-based taxes whose revenue is used to provide a public good whose supply benefits solely the resident of the country providing it. A subtle, but important, contribution of the paper is in introducing 'pseudo-optimal taxes' into the discussion of tax harmonization. These taxes are those obtained using the *optimal* tax formulas but evaluated at any *arbitrary* initial tax structure. Within this context, it has been shown that the results developed in Lahiri and Raimondos-Moller (1998) need to be appropriately recast using the above-mentioned 'pseudo-optimal taxes.' Importantly, though, the paper has reconfirmed that tax harmonization does emerge as an important policy instrument in achieving a potential Pareto-improvement.

ACKNOWLEDGMENT

This study was supported by the Economic and Social Research Council (ES/S00713X/1, Kotsogiannis) and the Spanish Ministry of Science, Innovation and Universities (RTI2018-095799-B-I00, Lopez-Garcia). The usual caveat applies.

ORCID

Miguel-Angel Lopez-Garcia http://orcid.org/0000-0002-5012-1869

REFERENCES

Abe, K. (1992). Tariff reform in a small open economy with public production. *International Economic Review*, *30*, 209–222.

Delipalla, S. (1997). Commodity tax harmonization and public goods. *Journal of Public Economics*, *63*, 447–466.

Dixit, A. K., & Norman, V. (1980). *Theory of international trade*. Cambridge University Press.

Karakosta, O., Kotsogiannis, C., & Lopez-Garcia, M.-A. (2014). Indirect tax harmonization and global public goods. *International Tax and Public Finance*, *21*(1), 29–49.

Keen, M. J. (1987). Welfare effects of commodity tax harmonization. *Journal of Public Economics*, *33*, 107–114.

Keen, M. J. (1989). Pareto-improving indirect tax harmonization. *European Economic Review*, *33*, 1–12.

Keen, M. J., Lahiri, S., & Raimondos-Møller, P. (2002). Tax principles and tax harmonization under imperfect competition: A cautionary example. *European Economic Review*, *46*, 1559–1568.

Keen, M. J., & Wildasin, D. (2004). Pareto-efficient international taxation. *American Economic Review*, *94*, 259–275.

Kotsogiannis, C., & Lopez-Garcia, M.-A. (2007). Imperfect competition, indirect tax harmonization and public goods. *International Tax and Public Finance*, *14*(2), 135–149.

Kotsogiannis, C., & Lopez-Garcia, M.-A. (2021). *Commodity tax harmonization and public goods provision* (Discussion Paper 029–20). Tax Administration Research Center, University of Exeter Business School.

Kotsogiannis, C., Lopez-Garcia, M.-A., & Myles, G. (2005). The origin principle, tax harmonization and public goods. *Economics Letters*, *87*(2), 211–219.

Lahiri, S., & Raimondos-Møller, P. (1998). Public good provision and the welfare effects of indirect tax harmonisation. *Journal of Public Economics*, *67*, 253–267.

Lockwood, B. (1997). Can commodity tax harmonisation be Pareto-improving when governments supply public goods? *Journal of International Economics*, *43*, 387–408.

Lopez-Garcia, M.-A. (1996). The origin principle and the welfare gains from indirect tax harmonization. *International Tax and Public Finance*, *3*, 83–93.

Lopez-Garcia, M.-A. (1998). On welfare and revenue effects of indirect tax harmonization. *Economics Letters*, *60*, 185–193.

Lucas, V. (2001). Tax harmonisation and the origin principle. *Economics Letters*, *71*, 111–115.

Turunen-Red, A. H., & Woodland, A. D. (1990). Multilateral reforms of domestic taxes. *Oxford Economic Papers*, *42*, 160–186.

Woodland, A. D. (1982). *International trade and resource allocation*. North-Holland.

How to cite this article: Kotsogiannis, C., & Lopez-Garcia, M.-A. (2021). On commodity tax harmonization and public goods provision. *J Public Econ Theory*. 23, 1220–1227. https://doi.org/10.1111/jpet.12535