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Tax policy and the location decision of firms

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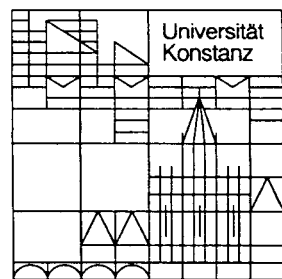
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Sonderforschungsbereich 178
„Internationalisierung der Wirtschaft“

Diskussionsbeiträge

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wissenschaften und Statistik

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**Tax Policy and the Location Decision
of Firms**

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Tax Policy and the Location Decision of Firms*

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Abstract

An optimal taxation approach is employed to discuss the interaction between factor and commodity taxes for a small open economy when profit-earning firms are mobile internationally. In this framework, a destination-based commodity tax is shown to be superior to an origin-based VAT from an efficiency perspective. Furthermore, in the absence of co-ordination measures the small country finds it optimal to charge a zero effective tax rate on corporate profits. This provides an argument for an increased role of the EU in the field of capital taxation if mobility costs within Europe are systematically lower than costs for outside investments.

Zusammenfassung

Anhand eines Optimalsteueransatzes wird das Zusammenwirken von Faktor- und Gütersteuern in einer kleinen offenen Volkswirtschaft untersucht, wenn die international mobilen Firmen reine Profite erwirtschaften können. In diesem ökonomischen Modellrahmen erweist sich eine bestimmungslandbasierte Mehrwertsteuer einer ursprungslandbasierten aus Effizienzgründen überlegen. Ohne internationale Koordinierungsmaßnahmen ist es für das kleine Land optimal, die Körperschaftsprofite mit einer effektiven Steuerbelastung von null zu belegen. Der theoretische Befund signalisiert Handlungsbedarf für die EU auf dem Gebiet der Kapitalbesteuerung, wenn die Mobilitätskosten für Firmen innerhalb des Binnenmarkts systematisch niedriger sind als Mobilitätskosten für die Verlagerung von Firmen zwischen der EU und Drittländern.

1 Introduction

The completion of the internal European market has important consequences for tax policy in the EU member countries. Since fiscal frontiers and border controls have been abolished and the free flow of factors across national borders is irrevocable, economic agents are offered new opportunities of tax arbitrage by shifting taxable activities to low tax regions in the EU.

Since 1993, EU citizens are allowed to purchase commodities in any member country at the going consumer prices, which include the commodity tax rate (VAT and excises) of the country of purchase. Cross-border shopping of final consumers is no longer subject to any border tax adjustment mechanism and follows the rules of an origin-based tax system, thereby favouring shopping in low tax countries. On the other hand, member states have decided to maintain the destination principle for commodity trade in the business sector. This is true for the prevailing transitional VAT regime (a variant of the deferred payment scheme) as well as for the Commission's proposal of a final European VAT with transnational tax credits. Each of these two commodity tax regimes is a mixture of elements of the two pure benchmark VAT systems, which follow either the general destination principle or the general origin principle. The same is true for the prevailing European excise tax system, which also contains elements of both principles.

Also since 1993, but in effect already since 1990, business capital can move freely between EU member countries and locate in any place which promises an attractive rate of return. Optimal location decisions for business activities are not only dependent on factor productivity but also on the tax burden which reduces the net rate of return. Profit taxes are most important and have attracted high attention but taxes on business inputs and outputs are relevant for location decisions as well.

This last issue has become highly topical in Germany after recent decisions of large German enterprises to build new plants abroad.¹ Net foreign direct investment in Germany has always been negative, but it has dropped to a stable low of roughly -30 billion DM (cf. Sachverständigenrat 1995, Fig. 10) per year in the 1990's and given a capital intensity between 100,000 and 200,000 DM per employee the aggregate effect on the German labour market amounts to an annual loss of jobs between 150,000 and 300,000. While much of

¹Prominent examples in 1995 include Daimler-Benz (in Lorraine/France) and Siemens (in the United Kingdom). The 1995/96 report of the Council of Economic Advisors has been headlined "Im Standortwettbewerb" to underline the urgency of the problem.

the current public debate is on regulation and wage costs, in particular due to increasing social security contributions paid by the employer, the German government has already responded in the field of capital taxation: in 1993 the top rate of capital income taxation has been reduced in the “Standortsicherungsgesetz” and the discussion about a second round of a business tax reform (including a partial abolition of the business tax and the business wealth tax) has only been postponed as a matter of fiscal pressure.

While consumer mobility on the one hand and the mobility of firms on the other pose similar co-ordination requirements at the European level, the Commission has concentrated on the commodity tax issue, due to its explicit responsibility laid down in Art. 99 of the Treaty of Rome. Arguments in favour of a harmonization of corporate income taxes, which have been summarized most prominently in the 1992 report of the Ruding committee, did not convince the Commission to expand its tax harmonization activities to direct taxes.

With respect to the final commodity tax regime for Europe, the decision to maintain a destination-based VAT has prompted criticism because of the tax-induced distortions through cross-border shopping (which have already required a partial harmonization of both VAT and excise tax rates), and because of the administrative problems of a European clearing house. The alternative of switching to a general origin-based VAT system after the abolition of border controls has never been discussed seriously in the political arena, even though this regime offers the prospect of more tax rate autonomy at the national level without an incentive for cross-border shopping in low tax countries. The main arguments for the Commission have been administrative feasibility and legal continuity rather than economic superiority, but recent theoretical work has shown that a number of serious obstacles attributed to the introduction of an origin-based VAT – such as administrative problems and the taxation of trade with non-member countries – can be overcome by a suitable design of this tax (Krause-Junk 1990, Lockwood/de Meza/Myles 1995, Genser 1995). Furthermore, an origin-based VAT – like a cash-flow tax on pure profits – retains its allocational efficiency in a world with international capital mobility (Bovenberg 1994, Genser/Haufler/Sørensen 1995).

There is, however, an important economic efficiency aspect which emphasizes the interaction of commodity and profit taxation for the locational decisions of firms. Whereas marginal capital investment decisions are determined by the marginal factor productivity and thus will be undistorted if gross marginal profits and the effective tax burden on them are both zero, locational decisions are based on average tax burdens and average returns.

Therefore, international differences in the effective rate of profit taxation will have distortive effects if we deviate from perfect competition and allow for capital rents and pure profits, for example due to a public input factor which is utilized costlessly.

Such a framework is in the regional and spatial economics tradition, which has attracted renewed interest after the publication of Paul Krugman's bestseller on Geography and Trade (1991). In the present paper, we adapt a model by Richter (1994) to formalize the optimal tax problem of a responsive policy maker in a small country which is open to cross-border shopping and to the inflow or outflow of internationally mobile firms. In section 2 we present a simple model which incorporates the interaction of destination- and origin-based commodity taxes, as well as wage and profit taxes, on the decisions of households and firms. The second-best tax rules derived in section 3 reveal a close substitutability between the origin-based commodity tax and the profit tax in a tax environment where wage income can be efficiently taxed. The analysis therefore backs the maintainance of a destination-based VAT from a second-best perspective, while an origin-based VAT does not turn out as an independent, efficiency enhancing tax instrument. It is also shown that it is always optimal for a small open economy to levy a zero effective tax rate on the profits of internationally mobile firms. In section 4 we discuss some of the trade and labour market effects induced by alternative tax instruments. Section 5 summarizes the argument.

2 An optimal taxation model for a small open economy

In its basic form, locational competition implies that firm compare the net profitability of operations in different regions, and choose their place of production where these net profits are highest. It is thus clear that a source of pure profits is central to any model of locational competition. In much of recent trade theory, firm profits follow from scale economies and monopolistic mark-up pricing when products are differentiated (Helpman and Krugman 1985, Krugman 1991). Alternatively, profits accruing to firms may be implicit returns to "missing" factors of production. One example of such unpaid factors are public intermediate inputs that are provided by the government and can be used without charge by all firms producing in a given region or country. This framework is attractive from a public finance perspective because it allows to treat both sides of the government budget (i.e., taxes and public expenditures) simultaneously.

The present paper follows this second approach. It uses a model developed by Richter (1994) but allows for a substantially enlarged set of tax instruments, whereas the level

of public intermediate inputs is exogenous to our analysis. Another difference is that we focus on the optimal design of the tax system for a small open economy rather than on conditions for global efficiency.

Consider then a small country with identical individuals that can be regarded as a single, representative household. The household supplies an endogenous amount of internationally immobile labour (L) and consumes an aggregate private good (C). Its utility function is strictly quasi-concave and given by

$$u = u(C, L). \quad (1)$$

The small open economy faces a fixed border price for the aggregate consumer good, which is normalized to unity. Furthermore, we assume that profit-making firms are fully mobile internationally so that arbitrage equates net profits in the small country to an exogenous threshold value π^W , which can be earned in the world market. The optimal tax problem is to find a cost-minimizing way to raise a given level of revenues, using four different tax instruments: the tax on commodities can either follow the destination principle (t_d) or the origin principle (t_o). In the first case, the tax corresponds to a consumption tax whereas it is a production tax in the second case. Furthermore, there are two factor taxes, a wage tax t_w and a (cash-flow) tax on pure profits t_p . For notational simplicity, all taxes are modelled as unit taxes.

Equilibrium prices in the small country differ from world prices through the tax rates chosen by the government. The producer price p is determined by

$$p = 1 - t_o, \quad (2)$$

whereas the consumer price q in the home country is

$$q = 1 + t_d. \quad (3)$$

With costless firm mobility, a profit tax must increase gross profits π per firm above the world level by the full amount of the tax,

$$\pi = \pi^W + t_p. \quad (4)$$

Finally, the wage tax creates a wedge between the gross wage w and the net wage ω ,

$$\omega = w - t_w. \quad (5)$$

Production in the small country takes place in n identical firms, which may either be owned by the domestic household or by foreigners. Production per firm $x(l)$ depends only

on the firm's level of employment and exhibits decreasing returns to scale, thus giving rise to pure profits. Implicitly, these profits are the return to an exogenously fixed level of a pure public good, which serves as an input in the production process and is supplied costlessly by the government. From (2) and (4), world prices and the government's tax choices determine both the producer price received in the home country, p , and the gross domestic profit requirement π . The definition of gross profits and the condition for the optimal employment of labour allow to express both the employment level per firm and the gross wage as functions of p and π

$$\pi = p x[l(p, \pi)] - w(p, \pi) l(p, \pi).$$

Differentiating with respect to p and π and using the property that $w = p (\partial x / \partial l)$ must hold along the firm's labour demand curve gives

$$\frac{\partial w}{\partial \pi} = \frac{-1}{l} < 0, \quad \frac{\partial w}{\partial p} = \frac{x(l)}{l} > 0. \quad (6)$$

Turning to the consumption side, the destination-based commodity tax (t_d) is an imperfect instrument under the conditions of the European internal market due to the absence of border controls. This is modelled by assuming that residents of the home country can shop abroad and purchase goods at the world price of unity, but these purchases are subject to convex transaction costs.² Consumer arbitrage will then equalize the marginal transaction costs of foreign purchases, $\tau'(c^F)$, with the difference in consumer prices between home and foreign goods. From (3) this implies $\tau'(c^F) = q - 1$ in the consumer optimum. Inverting determines the volume of cross-border shopping as a function of the domestic consumer price

$$c^F(q) = (\tau')^{-1}. \quad (7)$$

Aggregate consumption consists of domestic and foreign purchases of the homogeneous private good, $C = c^H + c^F$. Transaction costs incurred by cross-border shopping, $\tau(c^F)$, are assumed to consume real resources. The budget constraint for the representative individual in the home country is then

$$q c^H + c^F + \tau(c^F) = \omega L + \bar{n} \pi^W. \quad (8)$$

Equation (8) assumes that the consumer in the small country is endowed with a fixed number of profit-earning firms. Fixing this number clearly requires some justification since

²This assumes that the small country considered has a higher tax rate than at least some of its neighbours. In this case, adding a fixed tax in the large foreign country would not change any of the results derived.

entry is profitable in the present model. As argued in Richter (1994, p. 337), the model can nevertheless be interpreted as one of long-run equilibrium if it is assumed that there are fixed entry costs, which are just equal to world profits. Such entry costs can be interpreted as outlays for investments in physical or human capital, or for the establishment of a brand name. Since, from (4), net profits are independent of whether firms operate at home or abroad, profits represent a lump sum income in the present model.

Maximizing (1) subject to (8) yields the individual's indirect utility function $v(q, \omega)$. By Roy's identity, and setting the marginal utility of private income equal to one for notational simplicity, its derivatives are given by

$$\frac{\partial v}{\partial q} = -c^H(q, \omega), \quad \frac{\partial v}{\partial \omega} = L(q, \omega). \quad (9)$$

Production and consumption decisions together determine the last endogenous variable in this model, the number of firms operating in the small country. Since firms are identical by assumption, the labour market clearing condition gives

$$n(p, \pi, q, \omega) = \frac{L(q, \omega)}{l(p, \pi)}. \quad (10)$$

The government of the small country maximizes the indirect utility of the representative consumer, subject to a given revenue requirement R_0 . This revenue covers the outlays for the intermediate public input and, in addition, may be used to provide a fixed level of public consumer goods.³ The problem is thus

$$\max v(q, \omega) \quad \text{s.t.} \quad R_0 = t_d c^H + t_w L + t_o n x + t_p n,$$

where $n x$ is total output produced in the small open economy and t_p , modelled as a unit tax, acts like a tax on firms operating in the home country. Equations (6) and (10) are used to substitute out for n and x . Further using $c^H = C - c^F$ gives the Lagrangian

$$\mathcal{L} = v(q, \omega) + \lambda \left\{ t_d [C(q, \omega) - c^F(q)] + \left[t_w + t_o \frac{\partial w}{\partial p}(p, \pi) - t_p \frac{\partial w}{\partial \pi}(p, \pi) \right] L(q, \omega) - R_0 \right\}.$$

Using (2)–(5) and Roy's theorem (9), the first-order conditions for this problem are:

$$\frac{\partial \mathcal{L}}{\partial t_d} = -c^H + \lambda \left[c^H + t_d \left(\frac{\partial C}{\partial q} - \frac{\partial c^F}{\partial q} \right) + \alpha \frac{\partial L}{\partial q} \right] = 0, \quad (11)$$

$$\frac{\partial \mathcal{L}}{\partial t_w} = -L + \lambda \left[L - t_d \frac{\partial C}{\partial \omega} - \alpha \frac{\partial L}{\partial \omega} \right] = 0, \quad (12)$$

³Since this level is fixed by assumption, the public consumption good need not be incorporated in the utility function of the representative consumer.

$$\frac{\partial \mathcal{L}}{\partial t_p} = -\frac{\partial w}{\partial \pi} \frac{\partial \mathcal{L}}{\partial t_w} + \lambda L \left(t_o \frac{\partial^2 w}{\partial p \partial \pi} - t_p \frac{\partial^2 w}{\partial \pi^2} \right) = 0, \quad (13)$$

$$\frac{\partial \mathcal{L}}{\partial t_o} = \frac{\partial w}{\partial p} \frac{\partial \mathcal{L}}{\partial t_w} - \lambda L \left(t_o \frac{\partial^2 w}{\partial p^2} - t_p \frac{\partial^2 w}{\partial \pi \partial p} \right) = 0, \quad (14)$$

where

$$\alpha = t_w + t_o \frac{\partial w}{\partial p} - t_p \frac{\partial w}{\partial \pi} > 0 \quad (15)$$

can be interpreted as the effective tax rate on labour. Two observations should be pointed out in equation set (11)–(14). First, the two price effects in the round brackets of eq. (11) act in the same direction: $\partial C/\partial q$ is negative as *aggregate* consumption of the private good is reduced due to increased consumption of leisure whereas $\partial c^F/\partial q$ is positive due to the substitution of foreign for domestic goods. The cross-border shopping effect thus reinforces the aggregate consumption effect and tends to reduce the optimal consumption tax t_d . Secondly, note that equations (13)–(14) both contain the first-order condition for the wage tax, but also reveal interactive effects of the production and the profit tax rate on each other's tax base.

3 The optimal tax structure

We assume that the wage tax can be chosen optimally so that $(\partial \mathcal{L}/\partial t_w)=0$ in eq. (13)–(14). We can then solve (13) for t_p and substitute into (14). This gives, after straightforward manipulations

$$t_o \left[\frac{\partial^2 w}{\partial p^2} \frac{\partial^2 w}{\partial \pi^2} - \frac{\partial^2 w}{\partial p \partial \pi} \frac{\partial^2 w}{\partial \pi \partial p} \right] = 0. \quad (16)$$

The term in squared brackets equals the Jacobian determinant of the two functions $\partial w/\partial p$ and $\partial w/\partial \pi$. Since these are functionally dependent [cf. eq. (6)], this determinant must be zero and *any* value of t_o solves the equation.⁴ This is also true, in particular, if $t_o = 0$ is chosen. It is then seen from (13) that the optimal value for t_p is also zero. If labour can be taxed optimally, it is optimal for the government of the small open economy to leave firms' profits entirely untaxed.

To see that the effective tax rate on profits is zero for all optimal pairs of profit and production taxes consider the case where the production tax is exogenously constrained to be positive ($t_o > 0$). If wages can still be taxed optimally, it follows from (14) that the

⁴Differentiating (6) with respect to π and p and substituting in (16) reveals immediately the identity of the two products of second-order derivatives.

optimal capital tax must then be non-zero. Differentiating (6) with respect to π and using the symmetry of the second-order cross derivatives gives

$$t_p = t_o \frac{\partial^2 w / \partial \pi \partial p}{\partial^2 w / \partial \pi^2} = -t_o l \left(\frac{x}{l} - \frac{\partial x}{\partial l} \right) < 0, \quad (17)$$

from the decreasing marginal productivity of labour. Thus, if the origin-based consumption tax is positive, then the cash-flow tax on firm profits must be negative. The production tax reduces the price received by a firm operating in the home country below the world price and this is compensated in the optimum by a direct cash-flow subsidy which lowers the firm's gross domestic profit requirement relative to the world level.⁵ At the same time, the wage tax also adjusts downward to restore the effective tax rate on labour, α , as given in (15). This degree of freedom in choosing a set of optimal tax rates follows directly from the equivalence between a production tax on the one hand and an equal-rate tax on labour and profits on the other.⁶

Clearly, there is a close link between this result and the strand in the literature which shows that the optimal capital tax rate is zero in a small open economy that is perfectly integrated in world capital markets (Gordon 1986; Frenkel, Razin and Sadka 1991). The intuition in both cases is that, with perfect mobility of either capital or firms, the incidence of the tax falls entirely on labour. Therefore, a direct tax on labour dominates both a production tax and a profit tax on firms by avoiding additional production distortions. In the case of capital taxation, these production inefficiencies arise from the marginal product of capital in the small country exceeding its world opportunity cost. Analogously, in the present analysis of firm mobility the number of firms in the small country is "too low" under profit or production taxation, in the sense that the social return to a domestic firm (net profits earned plus tax revenue collected) exceeds the social return to a firm operating abroad.

It may be argued that the assumption of firms being perfectly mobile internationally is extreme. There may be mobility and migration costs for the firm itself (Hagen, Osmundsen and Schjelderup 1995) or firms may care about proximity to markets because of transportation costs for their goods (as in the geography-and-trade literature). However, it should be clear from the above discussion that imperfect firm mobility restores the case

⁵Equation (17) shows that this compensation must be complete since the round bracket on the right-hand side gives precisely the profit loss per unit of t_o at the optimal employment level. The first term (multiplied by l) is the reduction in the value of output whereas the second term describes the reduction in the gross wage, and thus (again multiplied by l) the savings in labour costs.

⁶Cf. Genser/Haufler (1996) for a more detailed discussion of this equivalence.

only for *either* a positive cash-flow tax on firm profits *or* an origin-based commodity tax. If both wages and profits can be optimally taxed in a framework with imperfect firm mobility, then a production tax still does not constitute an independent instrument and thus has no allocative role in the optimal tax system.

This is different for the destination-based commodity tax, even though this tax distorts both the labour-leisure choice and the decision whether to shop at home or abroad. However, as equation (11) shows, this tax cannot be replicated by other instruments. Therefore, an optimally chosen level of t_d will reduce the excess burden of taxation as compared to the case where this instrument is not available (i.e., where t_d is exogenously set to zero). Moreover, the optimal tax rate is likely to be positive. To see this, the first-order condition (11) is solved for t_d , giving

$$t_d = \frac{c^H(\lambda - 1) + \lambda \alpha (\partial L / \partial q)}{-\lambda (\partial c^H / \partial q)}.$$

The denominator of this fraction is positive since home consumption unambiguously falls in response to a domestic price increase. The first term in the numerator must also be positive since λ gives the shadow price of public funds and this must exceed the private marginal utility of income (here normalized to unity) whenever there is an excess burden of taxation (Atkinson/Stiglitz 1980, Ch. 12). Therefore, unless cross-price effects are sufficiently strong, the optimal tax rate t_d will be positive.

Summing up the normative part of this analysis, we have shown that a destination-based commodity tax is superior to an origin-based tax in a setting where both commodity and factor taxes are allowed. These two different sets of instruments are rarely integrated in theoretical contributions on international taxation and tax competition.⁷ One reason for the focus on either factor or commodity taxation in most of the relevant literature is that these instruments are generally not independent in simple settings with proportional taxation. However, in the present context this dependence is itself a strong argument against an origin-based commodity tax, since it is this instrument which can always be duplicated by an appropriate combination of wage and profit taxes.

⁷Counterexamples include Sinn (1990), who focuses on the joint trade balance effects of capital taxes and specific commodity taxes in a Heckscher-Ohlin model with perfect international capital mobility. Haufler (1996) considers the optimal tax problem for a small open economy in a mobile-capital version of the Ricardo-Viner trade model when factor and commodity taxes interact.

4 Trade balance and labour market effects

Apart from its normative implications, the choice between alternative tax instruments also has clear consequences for the pattern of trade flows when firms are internationally mobile. With \bar{n} denoting the number of firms “owned” by the home country, the profits earned abroad are $(\bar{n} - n)\pi^W$. If the model is interpreted as one of long-run equilibrium, a positive number of domestically owned firms operating abroad leads to a surplus in the balance of services and an accompanying trade deficit to balance the current account. The same holds, *mutatis mutandis*, if $(\bar{n} - n)$ is negative. In any case, by affecting the equilibrium number of firms operating in the home country, taxes have a straightforward influence on the trade balance in the present model.

There is a critical dividing line here between the destination-based commodity tax and the wage tax on the one hand, and the production and profit taxes on the other. The first two taxes affect the number of firms operating abroad only by changing the total labour supply $L(q, \omega)$, but leave the employment level per firm and the gross wage unaffected [cf. eq. (10)]. Since most empirical analyses suggest that these supply-side effects in the labour market are rather small, neither a wage tax nor a destination-based commodity tax can be expected to have a significant effect on the aggregate trade balance. Note, however, that an increase in t_d will still affect the trade pattern by inducing domestic consumers to shop abroad [eq. (7)]. With the balance of services (largely) unchanged, these increased consumer purchases must be paid by offsetting exports of the aggregate consumption good which are carried out at producer prices. This leads to the cross-hauling of a homogeneous commodity as a result of different tax regulations applying to final consumers purchases on the one hand and VAT-registered traders on the other.⁸

In contrast, the taxes t_p and t_o affect the gross wage and thus the labour demand of each firm. From (10), this change in l translates directly into a change in the number of firms operating in the home economy, even if aggregate labour supply remains largely unchanged. This is most obvious for the case of a cash-flow tax. Let us assume that this tax is imposed for external - say, distributional - reasons and that there is no offsetting production subsidy (i.e., $t_o = 0$). By raising the gross profit requirement and thus the employment level per firm, an increase in the cash-flow tax will reduce the number of

⁸ An example in the EU internal market is the “channel trade” between the United Kingdom and France, where products subject to high excises in Britain (mainly alcoholic beverages) are sold to British shoppers in the port of Calais at the lower French tax rates.

firms operating in the home country and improve the service account through a higher level of foreign-earned profits in the long-run equilibrium. At the same time, domestic production falls and the trade balance must deteriorate. Further, the cash-flow tax forces a reduction in the real wage from the first equation in (6). Intuitively, the reduction in the number of firms implies that less advantage is taken, in the aggregate, of the free public intermediate good and this reduces overall labour productivity in the home country for a given level of labour supply.

In the present representative-consumer, full-employment structure these changes have no further welfare effects. If wages are rigid, however, then profit taxation will have adverse effects on aggregate employment. A more realistic model with labour market imperfections is therefore likely to strengthen the result that uncoordinated profit taxation imposes significant costs on small countries when firms are highly mobile internationally.

5 Conclusions

The results of the present paper can be summarized in two main points. First, in a model that allows for both factor and commodity taxes the economic effects of an origin-based commodity tax – but not of a destination-based VAT – can be duplicated by an appropriate variation of factor taxes. It is a general lesson from second-best theory that distortions should be smoothed out over various margins whenever a first-best instrument is not available. Therefore, the maintenance of a destination-based VAT in Europe is supported from an optimal taxation perspective, despite the fact that this tax not only affects the labour-leisure choice but creates additional distortions through cross-border shopping. Although this result was derived under the simplifying assumption of perfect international mobility of firms, it should carry over to the more general case with mobility costs, as long as both wage and profit taxes can be chosen optimally.

The second result of the paper is that a small open economy will find it optimal to impose a zero (effective) tax rate on profits. This result does, of course, depend on the two assumptions that (i) international mobility of firms is perfect, and (ii) there is no co-ordination between EU countries. Turned around, this finding points to the need for harmonization measures in the field of capital taxation as European integration proceeds. The European Monetary Union, in particular, will further reduce transaction costs for both financial and real capital movements across European countries and thus put additional pressure on existing tax rates on corporate profits and capital income. An important

obstacle to any EU co-ordination measure is that such agreements are likely to remain geographically restricted whereas mobility of capital and firms is a global phenomenon. However, it is quite likely that continued integration in Europe will lead to a new source of rents, namely access to the European market (Keen 1993). In this case, the mobility costs faced by firms will be significantly lower within the EU than they are for investments in non-member states. This provides an argument for harmonization measures in Europe, even if co-ordination with the rest of the world is infeasible.

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