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INTERJURISDICTIONAL COMPANY TAXATION IN EUROPE, THE GERMAN REFORM AND THE NEW EU SUGGESTED DIRECTION

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Abstract

This paper proposes an analysis of two major tax events which occurred in the European Union in 2001, the move of Germany from imputation to exemption and the objective announced by the EU Commission to provide EU businesses with a consolidated corporate tax base for their EU-wide activities. In particular we examine as to whether those tax systems are able to become perfectly integrated tax systems by which we mean neutral tax systems with respect to financial, organisational and locational decisions of a multijurisdictional firm.

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1 Introduction

Two major tax events occurred in the European Union in 2001. Since January Germany - after Ireland and, *de facto*, UK in 1999 - has moved from the imputation to the exemption system¹ and in October the EU Commission released a report on company taxation which announced the Commission objective to provide EU businesses with a consolidated corporate tax base for their EU-wide activities².

Those two events resort to the same trend. The shift in the German tax system especially seems to end a period and to generate among scientists and philosophers of taxation a sort of "burn what you adored", while the EU suggested new direction goes a step ahead in that trend.

When, in the seventies, economists started to cope seriously with the taxation of companies - see the seminal works of King (1974) and Stiglitz (1973) - the vision of the company was clearly the one of an entity operating in a single jurisdiction and owned by shareholders who were individuals and residents of that jurisdiction. Economists were interested in analysing the tax systems from the viewpoint of their effects on corporate decisions regarding the size of investments, their financing, the dividend policy or the decision whether or not to incorporate a business. According to King (1977), more than 80 per cent of US firms owners at the end of the sixties, were individuals, as opposed to institutions. Corresponding figures for the UK were 47 percent. However, even then, those figures were progressively declining.

The focus of economists and tax designers was clearly then on the integration of the tax basis of the firm and of the individual shareholder, especially to ensure that progressivity was not altered by flat levies at corporate levels, that no - or not too much - incentive existed to prevent profit from shareholder taxation or that corporate and unincorporated profits were taxed in the same way. All that had to be related to the vision of what was - or still is - an equitable tax system, a vision much influenced by authors like Haig (1921) and Simons (1938) : they viewed an equitable system as a system where every taxpayer is taxed according to his or her ability-to-pay measured by his or her global income, independently of the type, source and use of the components of that income. In a framework where factors were interjurisdictionally immobile, that view is not incompatible with Ramsey (1927) efficiency.

In that prospect, the imputation, or crediting, system - where a fraction of the corporate tax paid by the company on profits intended to be distributed as dividends, is regarded as an advance payment on the tax liabilities of the shareholder - seemed to be especially desirable.

Typical of that period is the proposal of European tax harmonization issued by the EC Commission and reported by King (1977), pp. 57 and 58, that the EU "harmonization proposals are concerned solely with the taxation of distributed profits, and consist of two recommendations. The first is that harmonization

¹On the German tax reform, see a.o. Fuest and Huber (2000, 2001), Homburg (2000), Keen (2001) and Schreiber (2000).

²See COM(2001) 582 final.

should be under the imputation system with the basic rate of corporation lying within the range 45-55 %. (...) The second of the EEC Commission's proposals is that 'the tax credit shall be neither lower than 45 % nor higher than 55 % of the amount of corporation tax at the normal rate on a sum representing the distributed dividend increased by such tax''.

Around a quarter of a century later Fuest and Huber (2001) conclude a paper entitled "Is corporate-personal tax integration in open economies counter-productive ?" with the statement that "in an open economy, where the marginal shareholder is a foreigner, it is not desirable to offer double taxation relief for dividends paid by domestic firms to domestic shareholders".

That move illustrates quite well that we are now in another world, where capital is mobile and local companies are often subsidiaries of multinational enterprises.

It parallels the 2001 German tax reform. For a long time, that country has been a champion of imputation, with a full and repayable crediting system exhibiting at least two remarkable properties : neutrality with respect to the firm decision regarding the choice between equity and debt finance, on the one hand, equitable treatment of the share- and bondholders on the other hand, by which is meant that every share- or bondholder was taxed on firm's profit distributed under the form of dividend or interest at his or her own personal tax rate, thus in line with the ability-to-pay principle of an equitable taxation.

However, as already pointed out by Boadway and Bruce (1992), and by Devereux and Freeman (1995) too, those elegant properties are usually not permitted to cross the borders ; imputation of foreign tax is usually limited to the high of domestic tax liabilities³ so that the imputation system discriminates between residents and non-residents stockholders, which is especially hard to accept in today European Union.

If equity with respect to foreign shareholders cannot be an issue of special interest for the government of a given country, the non-respect of the financial neutrality property is however subject to consequences. Moreover new forms of tax neutrality gain sense in an international or interjurisdictional setting, like the neutrality with respect to the decision whether or not to incorporate a foreign affiliate entity⁴, and with respect to the location of the parent entity or of the foreign affiliate.

The concept of integration can be reinterpreted in that new context, shifted from the relation between a domestic company and its individual shareholders to the link between the members of a given multijurisdictional set of interrelated companies or branches, including so called controlled foreign companies or *CFC*.

³The reason for that limitation is obvious. If there were no such limitation, the foreign government would have the possibility to export the burden of its tax revenue by highly taxing non residents without causing them any damage in terms of net income.

⁴When a foreign affiliate is incorporated, it becomes a subsidiary and has its own legal personality ; otherwise it is termed a branch, a foreign entity operated under the legal umbrella of the abroad parent. Among the branches, tax law usually makes a distinction between permanent establishments like a plant or a store, and non permanent establishments, like a representation or a hall of exhibition ; in this paper we suppose that branches are permanent establishments.

The legal veil to be broken, between a firm and its stockholders, has changed but, in that change, has found out a new relevance. Said otherwise, individual shareholders are no longer within the integration perimeter of a company but that perimeter seems to have gained in effectivity.

The recent European Commission communication - EU Commission (2001) - goes a step forward in that direction when it proposes to organise a consolidated tax base for related entities operated on the territory of the European Union. Therefore the joint analysis of the German move and the EU Commission Report could be presented under the title : from one to another integration.

Thereafter section 2 of the paper suggests the concept of perfectly integrated tax system, by which is meant a tax system which has no influence on the financial decisions, the legal organisation and the location of the various entities of a multijurisdictional firm. Such a system is thus neutral with respect to the financial choice of the multijurisdictional firm - between issuing shares, issuing debt and using retained earnings -, with respect to its legal organisation - the choice of the legal form of the affiliated entities between a subsidiary and a branch -, with respect to the location of the parent entity - capital import neutrality - and with respect to the location of the branches or subsidiaries - capital export neutrality -. Thus it is a system "as if" the set of jurisdictions considered made a single jurisdiction. Incidentally note that it is a pre-condition for an equitable design of the tax system, by which is meant the design of the system according to distributive rules despite the mobility of the entities.

In section 3 we suppose that the tax base of each entity of a multijurisdictional firm is computed separately and we explore the possibility for a tax system set up in that framework to become a perfectly integrated one ; we conduct the analysis for the two most popular forms of interjurisdictional tax systems, imputation and exemption, examining successively their ability to be neutral with respect to financial decision, legal organisation, capital export and import, before setting forth the additional conditions necessary for those systems to become fully integrated. That exercise provides us with the opportunity to look at the German reform.

In section 4 we conduct a similar exercise assuming that a single tax base - a consolidated tax base - is computed for the whole multijurisdictional firm according to the tax law of the parent entity or of a suprajurisdictional entity. That exercise allows us to examine the new direction suggested by the recent EU Commission report on company taxation ; that report indeed suggests the computation of a consolidated base and its apportionment to the jurisdictions of the different entities, arguing a.o. that such a system can prevent Europe from some harmful tax competition and transfer pricing issues.

Some conclusions are suggested in section 5.

Before turning to section 2 let us add that, despite the - correct - assertion of Myles (1995) that "the study of the effect of taxation upon the corporation has gradually developed from the initial static analysis of Stiglitz and King through to fully intertemporal presentation such as Auerbach (1979) and Bradford (1981) (...) Results derived in a static setting can be instructive but are unable to capture many aspects of the problem", in this paper intertemporality

considerations are kept as simple as possible in order to avoid technical difficulties which could distract us from the core issue.

2 A perfectly integrated tax system

Let us assume a multijurisdictional firm which consists of a parent and two affiliated active entities like plants or stores, either incorporated - then they are subsidiaries of the parent - or not - then they are branches of the parent -. The affiliated active entities are located in two different jurisdictions denoted by i and j while the parent is located in h , a jurisdiction which can be either i or j . Without loss of generality the parent can be a company or an individual. Deemed to live for a long time, the multijurisdictional firm has invested one unit of money in production tools which are distributed among the affiliates. A fraction α has been invested in the entity located in jurisdiction i and a fraction $1 - \alpha$ in the entity located in jurisdiction j . Together the two entities produce one unit of good per period. Entity i produces a fraction α with a unit cost of production c' and entity j produces the complement with the same unit cost. Entity i sells a fraction q of the entire production of the multijurisdictional firm on the retail market at unit price $v' < 1$ while entity j sells the complement at the same unit price. A quantity $q - \alpha$ is traded between the two entities at a transfer price p' , with $c' \leq p' \leq v'$. Adopting an intertemporal perspective we substitute c , v and p for c' , v' and p' supposing that

$$c = \int c' e^{-rt} dt$$

with r a pure discounting rate, and similarly for v and p .

Respective corporate tax rates are τ_i and τ_j , invariant over time, and corresponding tax shields are a_i and a_j comprised between 0 and 1 which can be seen as discounted flows of depreciation allowances. Corresponding parameters for the parent entity are denoted by a subscript h .

In there is no integration at all the profit of the entity i , for its parent and before tax at that latter level, is

$$y_{i1} = (1 - \tau_i^d) [vq - p(q - \alpha) - c\alpha] + \tau_i^d a_i \alpha \quad (1)$$

with τ_i^d the tax rate on distributed profit, if the profit is repatriated as a dividend,

$$y_{i2} = (1 - \lambda_i \tau_i^u) [vq - p(q - \alpha) - c\alpha] + \tau_i^u a_i \alpha \quad (2)$$

if it is as an interest, with τ_i^u the tax rate on undistributed profit, $\lambda = 0$ under usual corporate tax rules where interest payment is deductible against the corporate tax base, and $\lambda = 1$ if cash flow tax is at work - then $a_i = 1^5$ -,

$$y_{i3} = (1 - \tau_i^u) [vq - p(q - \alpha) - c\alpha] + \tau_i^u a_i \alpha \quad (3)$$

⁵On the cash flow tax see Bradford (1977).

if it takes the form of a capital gain and, finally,

$$y_{i4} = (1 - \tau_i^b) [vq - p(q - \alpha) - c\alpha] + \tau_i^b a_i \alpha \quad (4)$$

if it comes from a permanent establishment or a branch, then noting τ_i^b the relevant tax rate applied at the branch level. Similar equations can be written for y_{jf} .

At the level of the parent entity a new taxation at rate τ_h with a tax shield a_h may occur. A first and extreme situation is characterised by a full second taxation at that level implying a final net income

$$y_{hf} = y_{if} + y_{jf} - \tau_{hf}(v - c) + \tau_h a_h \quad (5)$$

There is then *full double taxation*.

Moreover it is likely that in such a framework the multijurisdictional firm can make profit in manipulating, for tax purposes, the type of finance, the legal organisation, the location of the parent, the one of the active affiliate entities, or still the transfer price p . Unlike that, under a *perfectly integrated tax system*, the last equation becomes

$$y = (1 - \tau)(v - c) + \tau a \quad (6)$$

totally independent of any reference to finance, organisation or location specific parameters. Then, the multijurisdictional firm has no tax incentive to modify its financing policy, its legal organisation, the location of the plants and the one of the parent company, or to manipulate the transfer price. This system is viewed here as a desirable objective, especially since it avoids economic decisions for tax purposes and puts an end to tax competition. It is termed neutral with respect to finance decision, legal organisation, capital export and capital import. Note that capital export neutrality without capital import neutrality paves the avenue for tax competition in order to get headquarters or parent entities, while the converse calls for tax competition to get subsidiaries or branches and to transfer pricing strategies. Finally full integration is a pre-condition for an equitable design of the tax system, by which is meant the design of the system according to distributive rules despite mobility among entities and jurisdictions.

We will now explore under which conditions some particular tax designs are able to become perfectly integrated tax systems. We do that first in a setting characterised by separate tax bases, then in a framework where the tax base is consolidated.

3 Separated tax bases

In that setting the tax base is computed per entity as in the equations above. As shown the combination of that separate computation and separate taxation can cause full double taxation.

Most jurisdictions however have set up mechanisms to mitigate that double taxation ; a typology of those systems is proposed a.o. by Alworth (1988), Mintz and Tulkens (1996) and completed by Gérard and Gillard (2001). A first way to alleviate the full double taxation is to adopt what Feldstein and Hartman (1979) term the *full taxation after deduction* and that we still name *double taxation* ; then the last equation becomes,

$$y_{hf} = (1 - \tau_{hf})(y_{if} + y_{jf}) \quad (7)$$

but most popular instruments to do that are the two mechanisms described below, imputation - also named crediting - and exemption. Both have interesting properties but neither supports a perfectly integrated tax system except if they are supplemented by some additional institutional features.

3.1 Imputation

Under an *imputation* or *crediting* system a fraction x of the tax paid by the subsidiary on the profits to be distributed as dividends is regarded as an advance of further tax liabilities at shareholders level ; the advance, or tax credit, can also be computed as a fraction x' of the gross dividend. As a consequence, net income of the parent, from i , is

$$\begin{aligned} y_{h1} &= (1 - \tau_i^d) [vq - p(q - \alpha) - c\alpha] + \tau_i^d a_i \alpha \\ &\quad - \tau_{h1} \{ (1 - \tau_i^d) [vq - p(q - \alpha) - c\alpha] + \tau_i^d a_i \alpha \} \\ &\quad - \tau_{h1} x_h \{ \tau_i^d [vq - p(q - \alpha) - c\alpha] - \tau_i^d a_i \alpha \} \\ &\quad + x_{h1} \{ \tau_i^d [vq - p(q - \alpha) - c\alpha] - \tau_i^d a_i \alpha \} \\ &= (1 - \tau_{h1}) (1 - \tau_i^d + x_h \tau_i^d) [vq - p(q - \alpha) - c\alpha] \\ &\quad + (1 - \tau_{h1}) (1 - x_h) \tau_i^d a_i \alpha \end{aligned} \quad (8)$$

A generalisation of that principle implies that a fraction x^λ applies in case of interest, a fraction x^g in case of capital gains - on that latter generalisation, see Gérard (1982) - and a fraction x^b in case of branch profit. Then

$$\begin{aligned} y_{h2} &= (1 - \tau_{h2}) (1 - \lambda_i \tau_i^u + x_h^\lambda \tau_i^u) [q - p(q - \alpha) - c\alpha] \\ &\quad + (1 - \tau_{h2}) (1 - x_h^\lambda) \tau_i^u a_i \alpha \end{aligned} \quad (9)$$

$$\begin{aligned} y_{h3} &= (1 - \tau_{h3}) (1 - \tau_i^u + x_h^g \tau_i^u) [q - p(q - \alpha) - c\alpha] \\ &\quad + (1 - \tau_{h3}) (1 - x_h^g) \tau_i^u a_i \alpha \end{aligned} \quad (10)$$

and

$$\begin{aligned} y_{h4} &= (1 - \tau_{h4}) (1 - \tau_i^d + x_h^b \tau_i^d) [q - p(q - \alpha) - c\alpha] \\ &\quad + (1 - \tau_{h4}) (1 - x_h^b) \tau_i^d a_i \alpha \end{aligned} \quad (11)$$

and similarly for profits from j . However that last equation doesn't make sense if the branch and the parent are located in the same jurisdiction.

We can now investigate the properties of the system.

Let us start with financial neutrality. To examine that property we only need to consider the first three among the last four equations. Then we can state that,

Proposition 1 (F-neutrality) *The imputation system is neutral with respect to financial choices if (1) the imputation is full, generalised, incentive compatible and repayable, and (2) the tax rate at parent level doesn't discriminate among types of income.*

full and generalised Then indeed $x_h = x_h^\lambda = x_h^g = 1$ and

$$y_{hf} = (1 - \tau_{hf})(v - c) \quad (12)$$

This condition is rarely met by actual systems. Under most of them, when full imputation is operated $x_h = 1$ and x_h^λ is not necessary since cash flow tax is actually almost never used⁶. Otherwise x_h^g is usually zero.

incentive compatible Incentive compatible means that the parent has to find its own interest using the system. Indeed in most systems a withholding tax, at best fully creditable on parent own tax liability and repayable if necessary, is levied at source on distributed dividends, at a rate \bar{m}_{i1} . The imputation system is incentive compatible if, omitting the tax shield and assuming the paid out dividend to be equal to 1,

$$(1 - \tau_{h1}) \frac{(1 - \tau_i^d + x_h \tau_i^d) d_i}{1 - \tau_i^d} \geq (1 - \bar{m}_{i1}) d_i \quad (13)$$

That condition is fulfilled if adequate exchange of information is at work between the paying company and the tax administration of the investor or if the existence of a tax base at parent level is otherwise exactly known by that administration ; that condition does make problem when the parent is a private person operating in a framework of anonymous shares and bank secrecy, especially if he or she is a non resident. Incidentally this explains why a relatively high withholding tax is a necessary companion of imputation when some bank secrecy exists.

⁶A notable exception is Italian Irap - see a.o. Alworth and Arachi (2001), Bordignon *et al.* (2001) - ; the Italian corporate tax system consists of a dual income tax called Ipeg and a direct tax on value added called Irap (the rate of that latter tax is smaller but the base includes interest payments and wage costs).

repayable That condition implies that the tax administration accepts that the tax liability of the parent might be negative and then repays it with the amount of the excess credit. Such a condition rules out the limitation of the credit to the high of the parent domestic tax liabilities. If such a limitation does exist⁷,

$$y_{h1} = \min \left\{ (1 - \tau_{h1}) \frac{(1 - \tau_i^d + x_h \tau_i^d) d_i}{1 - \tau_i^d}, (1 - \bar{m}_{i1}) d_i \right\} \quad (14)$$

More importantly repayability is never operated at international level⁸. The reason is straightforward : if applied the government of the distributing entity would have an incentive to tax outflow of income as high as possible since it can then generate tax revenue the burden of which is entirely supported by the government of the parent entity. However non-repayability creates a discrimination between resident and non-resident shareholders, a major reason which motivated Germany to give up that system (see the example below).

non discrimination among types of income That non discrimination implies that the tax rate at parent level is independent of the type of income, so that $\tau_{hf} = \tau_h$, $f = 1, 2, 3$. This implies in particular that the capital gains are taxed like dividends and interest income, when accrued, or that an equivalent system is operated.

If the conditions are fulfilled,

$$y_{hf} = (1 - \tau_h) [vq - p(q - \alpha) - c\alpha] , f = 1, 2, 3 \quad (15)$$

independent of the financing policy. Then only the tax rate of the parent jurisdiction is relevant and imputation applies the *residence* principle of interjurisdictional taxation. However since repayability never, or almost never, applies in international fiscal relations, it may be that financial neutrality is present for an investment in the entity of the parent jurisdiction, say $h = i$, but not for an investment in the other entity, say j . Otherwise non repayability can turn the imputation system to be either an application of the *residence* principle or of the *source* principle, depending on the relative high of the levies in both jurisdictions (see the example).

Example 2 (Imputation in Germany before the reform) *As an illustration consider the pre-reform German situation and assume that both the subsidiary and the parent are German, the latter one being either a German company or an individual resident taxpayer of that country. Given the tax parameters - $\tau_i^d = .3165$, $\tau_i^u = .422$, $\tau_h = \tau_i^u$ if the parent is a company and $\tau_h = .51$*

⁷Belgian reader will note that non refundability explained to some extent why such a system failed in Belgium.

⁸See especially Grubert (1998) ; a noticeable exemption seems to be the German-French tax treaty. An alternative solution noted by Alfons Weichenrieder is to have the tax repaid by the jurisdiction of the paying entity rather than by the one of the recipient ; such a system, which looks like an upstream exemption, is actually the one used for withholding taxaes. Otherwise mechanisms of clearing can also be set up.

if it is an individual, except for capital gains where it is zero for an individual, the other tax parameters being zero too -, one has that, assuming no tax shield,

	individual	company
dividend	$y_{h1} = 1 - \tau_h = .49$	$y_{h1} = 1 - \tau_h = .5780$
interest	$y_{h2} = 1 - \tau_h = .49$	$y_{h2} = 1 - \tau_h = .5780$
cap. gain	$y_{h3} = 1 - \tau_i^u = .578$	$y_{h3} = (1 - \tau_h)(1 - \tau_i^u) = .3341$

Generalisation of the imputation to capital gains should set equal all the figures of the same column.

However that system discriminates between resident and non resident shareholders. Suppose that two shareholders of a German firm are subject to a tax rate $\tau_h = .35$, however one is a resident taxpayer of Germany while the other is not. Since the German withholding tax on dividend paid to non residents is $\bar{m}_{i1} = .2638$, the final income of the resident shareholder will be $1 - .35 = .65$ while the corresponding income of the non resident will be, $(1 - .2638)(1 - .3165) = .5032$, still assuming no tax shield in Germany ; the discrimination is due to the fact that, even if the jurisdiction of the non resident applies the imputation system it will not refund the German withholding tax together with the German corporate income tax since $.2638(1 - .3165) + .3165 = .4968 > .35$. The system applies the residence principle as long as the resident shareholder is concerned, the source principle with the other shareholder.

However the last equation also shows that the *tax shields* granted to the firm are lost when the income reaches the shareholder ; inspection of the equations reveals that additional tax shield increases the profit at corporate level on the one hand, but reduces the credit to the shareholder accordingly on the other hand. This remark is especially meaningful when the active entity and the parent resort to different jurisdictions and it raises the question of the way the tax shields and incentives cross the borders ; clearly, in the system described above, an incentive given by the foreign jurisdiction turns out to be a transfer to the government of the parent jurisdiction. Beyond that is the question of the transmission of the tax shields from the tax base of the upstream entity to the one of the parent.

In line with that, the internal rate of return is then $(1 - \tau_h)(v' - c')$ and then the marginal effective tax rate amounts to τ_h so that there is a tax wedge⁹.

We can now turn to legal organisation and examine if the imputation system can be neutral with respect to the decision to incorporate an affiliate entity or to keep it operating as a branch of the parent. Then we could be tempted to write the proposition without its third condition,

Proposition 3 (LO-neutrality) *The imputation system is neutral with respect to the legal organisation of the business if (1) the imputation is full, generalised, incentive compatible and repayable, (2) the tax rate at parent level doesn't*

⁹The marginal effective tax rate is defined as the difference between the internal rate of return without and with taxation, divided by the former one ; the tax wedge is the numerator of that fraction. See King and Fullerton (1984), Gérard (1993).

discriminate among types of income including profits from branches, and (3) tax shield in the jurisdiction of the parent is granted independently of the location of the branch or the subsidiary.

Indeed if conditions (1) and (2) are satisfied, apparently

$$y_{hf} = (1 - \tau_h)(v - c) , f = 1, 2, 3, 4 \quad (16)$$

with of course the same *caveats* as above regarding the verification of the conditions in the real world. However if a branch and the parent are located in the same jurisdiction imputation is meaningless and, other things being equal,

$$y_{h4} = (1 - \tau_h)[vq - p(q - \alpha) - c\alpha] + \tau_h a_h \alpha \quad (17)$$

if the branch is in $h = i$ while the tax shield is lost if the branch is located elsewhere.

Then the only way to obtain LO neutrality is to complete the proposition with the requirement that tax shield in h is granted independently of the location of the branch or the subsidiary. Then indeed,

$$y_{hf} = (1 - \tau_h)(v - c) + \tau_h a_h , f = 1, 2, 3, 4 \quad (18)$$

That additional requirement designs the imputation system in reference to the full double taxation described above, and imposes a complete re-computation of the tax base according to the rules prevailing in the jurisdiction of the parent. This is apparently the way adopted by Japan and the US. Then the marginal effective tax rate amounts to

$$\frac{\tau_h(1 - a_h)}{1 - \tau_h a_h} < \tau_h \quad (19)$$

so that re-computation of the tax base according to the rules prevailing in the jurisdiction of the parent turns out to reduce the marginal effective tax rate.

The three conditions stated above also allows us to write that,

Proposition 4 (KX-neutrality) *The imputation system is neutral with respect to the location of the branches or subsidiaries if (1) the imputation is full, generalised, incentive compatible and repayable, (2) the tax rate at parent level doesn't discriminate among types of income including profits from branches, and (3) tax shield in the jurisdiction of the parent is granted independently of the location of the branch or the subsidiary.*

Under those conditions, if tax competition is at work, it is to attract headquarters, not active branches or subsidiaries. If governments compete to get jobs provided by multijurisdictional firms, the imputation system operated under the mentioned conditions certainly mitigates tax competition. Otherwise no problem of transfer pricing occurs since y_h is independent of p as it is of α and q .

Do we now have a candidate for the *perfectly integrated tax system*, free of tax competition ?

The answer is negative. Indeed stopping potential tax competition for getting headquarters further involves that (τ_h, a_h) be independent of h which needs a further *harmonisation of the tax rates and bases*. Such an harmonisation is also needed if discrimination among parents from different jurisdiction of residence is to be avoided. Then,

Proposition 5 (Perfectly integrated tax system) *The imputation system is a perfectly integrated tax system if (1) the imputation is full, generalised, incentive compatible and repayable, (2) the tax rate at parent level doesn't discriminate among types of income including profits from branches, (3) tax shield in the jurisdiction of the parent is granted independently of the location of the branch or the subsidiary, and (4) tax parameters in the parent jurisdiction are independent of the location of the parent.*

As a conclusion of this discussion, imputation or crediting is an elegant construction, however the conditions for that system to have the desirable properties mentioned and discussed so far are hard to satisfy and quasi never met in the real world, especially the condition of repayability.

3.2 Exemption

The alternative to the imputation is the *exemption* system. Then income is not or nearly not taxed either at branch or subsidiary level or at parent level, most often at that latter level¹⁰. Let us note δ_h the fraction of the income which is not tax exempt at parent level. Then we have,

$$y_{h1} = (1 - \delta_{h1}\tau_{h1}) (1 - \tau_i^d) [vq - p(q - \alpha) - c\alpha] + (1 - \delta_{h1}\tau_{h1}) \tau_i^d a_i \alpha \quad (20)$$

$$y_{h2} = (1 - \delta_{h1}\tau_{h2}) (1 - \lambda_i \tau_i^u) [vq - p(q - \alpha) - c\alpha] + (1 - \delta_{h1}\tau_{h2}) \tau_i^u a_i \alpha \quad (21)$$

$$y_{h3} = (1 - \delta_{h1}\tau_{h3}) (1 - \tau_i^u) [vq - p(q - \alpha) - c\alpha] + (1 - \delta_{h1}\tau_{h3}) \tau_i^d a_i \alpha \quad (22)$$

¹⁰A notable exception is foreign profits derived through a non permanent establishment. According to article 7.1 of the model tax convention of the OECD, taxation is only permitted in the parent entity jurisdiction. Conversely if business abroad is carried through a permanent establishment, the jurisdiction of that establishment is the only one entitled to tax the corresponding profit.

and

$$y_{h4} = (1 - \delta_{h1}\tau_{h4}) (1 - \tau_i^d) [vq - p(q - \alpha) - c\alpha] + (1 - \delta_{h1}\tau_{h4}) \tau_i^b a_i \alpha \quad (23)$$

respectively.

We can then state and prove the following propositions, starting again with neutrality with respect to the choice between issuing shares, issuing debts and using retained earnings.

Proposition 6 (F-neutrality) *The exemption system is neutral with respect to financial choices if (1) exemption at parent level is full, (2) the tax system at subsidiary level doesn't discriminate between distributed and undistributed profits, and (3) cash flow tax is at work.*

Full exemption at parent level means that $\delta_{hf} = 0$, $f = 1, 2, 3$ while the absence of discrimination between distributed and undistributed profits implies $\tau_i^d = \tau_i^u = \tau_i$ and similarly for j . Further requirement that cash flow tax is at work implies $\lambda = 1$ and $a = 1$ so that,

$$y_{if} = (1 - \tau_i) [vq - p(q - \alpha) - c\alpha] + \tau_i \alpha, \quad f = 1, 2, 3 \quad (24)$$

Such a system is operated according to the *source* principle¹¹.

Example 7 (Exemption in Germany after the reform) *As an illustration consider the post-reform German situation and assume that both the subsidiary and the parent are German, the latter one being either a German company or an individual resident taxpayer of that country. Given the tax parameters - $\tau_i = .2675$, $\delta_{h1} = .05$ and $\tau_{h1} = \tau_{h2} = \tau_i$ if the parent is a company and $\delta_{h1} = 0.50$ and $\tau_h = .51$ if it is an individual, this rate being equal to zero for capital gains, other δ_{hf} being set to 1 and the other tax parameters being zero too -, one has that, assuming no tax shield,*

	<i>individual</i>	<i>company</i>
<i>dividend</i>	$y_{h1} = (1 - 0.5\tau_h)(1 - \tau_i)$ $= .5457$	$y_{h1} = (1 - 0.05\tau_h)(1 - \tau_i)$ $= .7227$
<i>interest</i>	$y_{h2} = 1 - \tau_h = .49$	$y_{h2} = 1 - \tau_h = .7325$
<i>cap. gain</i>	$y_{h3} = 1 - \tau_i = .7325$	$y_{h3} = 1 - \tau_i = .7325$

Let us examine the last column. Since both the paying company and the parent one are German, the taxation of interest at parent level is equivalent, in that respect, to non deductibility of interest payment at paying entity level combined with full exemption at recipient level. Full exemption is now at work for capital gains while it is imperfect for dividends ; should the exemption be perfect, figures in the last column would be equal. Strict application of exemption in the first column should generate identical equal figures in both columns.

¹¹For a partial application, see the Italian reform mentioned in note 6 above. An alternative way to organise F-neutrality can be to give up taxing not only interest payments but also any ordinary capital income, see the Allocation for Capital Equity, or ACE suggested by the Institute for Fiscal Studies (1991), see Gammie (1992).

For an exemption system which is neutral with respect to financial choices to be also LO-neutral, we need that the last equation also holds for $f = 4$.

Proposition 8 (LO-neutrality) *The exemption system is neutral with respect to the legal organisation of the business if (1) exemption at parent level is full, (2) the tax system at subsidiary level doesn't discriminate between distributed and undistributed profits and taxes branch profits similarly, and (3) cash flow tax is at work.*

Inspection of the last equation immediately shows that the exemption system violates the horizontal and vertical equity principles according to which each parent has to be taxed in line with its ability-to-pay. Indeed here each parent is taxed separately on its location characterised incomes, whatever the total amount can be. In terms of equity in the Haig-Simons view, moving from imputation to exemption means a loss.

An immediate consequence is that we have,

Proposition 9 (KM-neutrality) *The exemption system is neutral with respect to the location of the parent if (1) exemption at parent level is full, (2) the tax system at subsidiary level doesn't discriminate between distributed and undistributed profits and taxes branch profits similarly, and (3) cash flow tax is at work.*

Under those conditions, if tax competition is at work, it is to attract branches or subsidiaries, presumably active entities like plants. If government compete to get jobs provided by MNE workers, the exemption system certainly boosts tax competition.

Moreover this situation is likely to generate problems of transfer pricing and strategic location of the production and the distribution.

Transfer pricing Manipulating the price p used for internal transactions within the multijurisdictional firm can change the value of y , since,

$$\frac{\partial y}{\partial p} = (\tau_i - \tau_j)(q - \alpha) \neq 0 \quad (25)$$

Especially if the i entity needs to buy to the j entity, $q - \alpha > 0$ and p will be increased if $\tau_i > \tau_j$ in order to minimise the tax base in the higher taxing jurisdiction¹².

¹²See the literature on transfer pricing, in particular the critical appraisal of transfer pricing manipulation in conclusion of the empirical study of Bernard and Weiner (1990). They argue that while in general multinational corporations can reduce their tax obligations by setting transfers prices that differ from at arm's length prices, their ability to do so is constrained by tax regulation in their home and host countries. Otherwise it may be easier to avoid taxes through other channels - we immediately think of management fees and royalties for patents or know how - while transfer price may serve a primarily managerial role within the firm, as described by Eccles (1985) and Robbins and Stobaugh (1973). See also e.g Elytzir and Mintz (1996) and Weichenrieder (1996) and on the specific issue of the primary and secondary adjustments, Gérard and Godefroid (2001).

Tax competition or strategic location of the plant or the distribution Indeed now,

$$y = (1 - \tau_i)[vq - p(q - \alpha) - c\alpha] + \tau_i\alpha + (1 - \tau_j)[v(1 - q) + p(q - \alpha) - c(1 - \alpha)] + \tau_j(1 - \alpha) \quad (26)$$

and

$$\frac{\partial y}{\partial \alpha} = (\tau_j - \tau_i)(p - c - 1) \neq 0 \quad (27)$$

If $\tau_i > \tau_j$, the sign of that expression depends on the one of $p - c - 1$ and thus on the "generosity" of the depreciation allowances mechanism ; if it is generous, as it is the case under cash flow tax, it may be that the multijurisdictional firm finds its interest to locate where the tax rate is higher to benefit more from that "generosity"¹³. Similarly,

$$\frac{\partial y}{\partial q} = (\tau_j - \tau_i)(v - p) \neq 0 \quad (28)$$

and it will locate distribution in jurisdiction j .

Do we now have a candidate for the *perfectly integrated tax system*, free of tax competition ?

The derivatives just above imply answering negatively to that question. Indeed stopping potential tax competition for getting branches or subsidiaries further involves that (τ_i, a_i) be independent of i and j , which needs a further *harmonisation of the tax rates and bases*. Then,

Proposition 10 (Perfectly integrated tax system) *The exemption system is a perfectly integrated tax system if (1) exemption at parent level is full, (2) the tax system at subsidiary level doesn't discriminate between distributed and undistributed profits and taxes branches profits similarly, (3) cash flow tax is at work, and (4) tax parameters in the branches or subsidiaries jurisdictions are independent of the location of those entities.*

As a conclusion of this discussion, exemption can be a good candidate to the status of a perfectly integrated tax system if completed with cash flow tax and harmonised tax rates and bases¹⁴. However a problem with exemption arises if the income comes from a low tax jurisdiction. It could be useful then to have it deemed to be channelled through a fictive jurisdiction with a minimum accepted

¹³This a (marginal) effective tax rate argument ; since such a rate is equal to $\frac{\tau(1-a)}{1-a\tau}$, its value decreases when a goes up.

¹⁴That system is close to the Comprehensive Business Income Tax (CBIT) proposed by US Treasury in 1992, see US Treasury Dept. (1977) and Tax Law Revue, 47 (3), 1992, especially Sunley (1992). The entire issue of that latter publication was devoted to various analyses of the US Treasury proposals ; indeed the US Treasury outlined various alternatives, but the favoured one was CBIT.

tax rate supposed to be the source one. Incidentally let us note that under this system each administration has only to know the rules of its tax system.

Moreover notice that, since $a = 1$, the marginal effective tax rate then vanishes so that, using that criterion, the efficiency loss involved by the exemption system is smaller.

4 Consolidated tax base

Imagine now that a *consolidated tax base* is computed in the jurisdiction of the parent entity and then *apportioned* to jurisdictions i and j according to some criteria, like sales, labour cost, the distribution of the property or still the value added¹⁵. The consolidated tax base is then

$$t = v - c - a_h \quad (29)$$

further apportioned to the two jurisdictions according to some criteria. Consider only one such criterion, the value added, which seems to be most in line with EU way of thinking. Then, tax liabilities in the respective jurisdictions are

$$\tau_i \frac{[vq - p(q - \alpha) - c\alpha]}{v - c} (v - c - a_h) \quad (30)$$

and

$$\tau_j \frac{[v(1 - q) + p(q - \alpha) - c(1 - \alpha)]}{v - c} (v - c - a_h) \quad (31)$$

so that the net income of the firm becomes

$$\begin{aligned} y &= v - c \\ &\quad - \tau_i [vq - p(q - \alpha) - c\alpha] \frac{v - c - a_h}{v - c} \\ &\quad + \tau_j [v(1 - q) + p(q - \alpha) - c(1 - \alpha)] \frac{v - c - a_h}{v - c} \end{aligned} \quad (32)$$

Should we use sales on the retail market instead of value added, or the distribution of labour cost or of property, that equation becomes

$$y = v - c - \{\tau_i q + \tau_j (1 - q)\} (v - c - a_h) \quad (33)$$

or

$$y = v - c - \{\tau_i \alpha + \tau_j (1 - \alpha)\} (v - c - a_h) \quad (34)$$

We can now examine that system according to the same criteria as in the previous section.

¹⁵On consolidated tax base and apportionment, see Goolsbee and Maydew (2000) and Weiner (2001).

F-neutrality Since we are within a consolidated entity the problem of the *financial neutrality* within the firm is no longer relevant and the system is *per se* F-neutral enforcing. However a problem arises when financing outside the firm is considered. It might be solved using the rules described for the exemption mechanism. Then,

Proposition 11 (F-neutrality) *The consolidated tax base with apportionment system is neutral with respect to financial choices if it incorporates a F-neutral exemption system for outside finance.*

LO-neutrality *Per se*, consolidation involves neutrality with respect to legal organisation, assuming that the legal form of the entity is not a criterion of apportionment. Then,

Proposition 12 (LO-neutrality) *The consolidated tax base with apportionment system is neutral with respect to the legal organisation of the business if the legal organisation of the business is no part of the set of criteria of the apportionment rule.*

KM-neutrality Apportionment doesn't imply capital import neutrality and thus neutrality with respect to the location of the parent since y is not independent of h . However if the composition of the tax base becomes independent of the jurisdiction where it is computed, then the consolidated tax base with apportionment system can be KM-neutral. Within the EU, this is an argument to set up common rules for computing the tax base.

Notice that if the system fulfills the conditions of F-neutrality, it imbeds cash flow taxation and thus $a_h = 1$ necessarily independent of h .

Then,

Proposition 13 (KM-neutrality) *The consolidated tax base with apportionment system is neutral with respect to the location of the parent if the computation of the tax base obeys rules which are independent of the location of the parent.*

KX-neutrality We first note that consolidated tax base with apportionment doesn't rule out transfer pricing strategies nor tax competition¹⁶. Indeed

$$\frac{\partial y}{\partial p} = (\tau_i - \tau_j) (q - \alpha) \frac{v - c - a_h}{v - c} \neq 0 \quad (35)$$

¹⁶Though they use another type of model Nielsen, Raimondos-Moeller and Schjelderup (2001) obtain a similar result, concluding "that the strategic and tax-saving incentives to exploit transfer pricing may well be stronger under formula apportionment than under separate accounting".

However, unlike Nielsen, Raimondos-Moeller and Schjelderup (2001), we observe a smaller effect that under separate accounting¹⁷, since

$$\frac{v - c - a_h}{v - c} < 1, \quad a_h > 0 \quad (36)$$

The similar observation holds when we examine strategic location of either the production or the distribution.

$$\frac{\partial y}{\partial \alpha} = (\tau_j - \tau_i) (p - c) \frac{v - c - a_h}{v - c} \quad (37)$$

and

$$\frac{\partial y}{\partial q} = (\tau_j - \tau_i) (1 - p) \frac{v - c - a_h}{v - c} \quad (38)$$

Should we use another apportionment formula, the signs of the results are similar,

$$\frac{\partial y}{\partial q} = (\tau_j - \tau_i) (v - c - a_h) \quad (39)$$

if sales on the retail market is the criterion and

$$\frac{\partial y}{\partial \alpha} = (\tau_j - \tau_i) (v - c - a_h) \quad (40)$$

if labour cost or property is the criterion. Note however that moving the places where the good is sold from - changing q - can be less harmful than moving the place of production - changing α -, which inherently implies jobs.

It turns out that the only way to rule out tax shifting strategies and tax competition incentives is to harmonise the tax rates too, so that,

Proposition 14 (KX-neutrality) *The consolidated tax base with apportionment system is neutral with respect to the location of the branches and subsidiaries, and the strategic use of transfer pricing as well, if the tax rates are independent of the location of the branches or subsidiaries.*

It should be noted that substituting apportionment formula determined in a an aggregate way doesn't change the problem since the firm can always escape paying tax in a high tax jurisdiction by simply closing down its entity in that jurisdiction.

As a conclusion,

Proposition 15 (Perfectly integrated tax system) *The consolidated tax base with apportionment system is a perfectly integrated tax system if (1) it incorporates a F-neutral exemption system for outside finance, (2) the composition of the tax base is independent of the jurisdiction where the consolidated tax base is computed, and (3) the tax rates are independent of the jurisdictions where the entities are located.*

¹⁷Remember that $a_h \leq 1$, and assume that $v - c - 1 > 0$ which, due to the intertemporal definition of v and c , means that the margin in the firm is larger than the return of an investment outside the firm, a rather weak assumption since otherwise the investment is not undertaken.

Also observe that, as under the exemption system, the internal rates of return with and without tax are equal so that the marginal effective tax rate vanishes.

5 Conclusion

Some policy conclusions arise from the discussion conducted in the paper, as well as avenues for further research.

First, due to the discrimination among resident and non resident shareholders implied by the non-repayability of excess tax credit, *the imputation system apparently definitively belongs to the past*, at least within an area where such kind of discrimination is against the basic principles of the Union¹⁸. Nevertheless it could come back to the forefront if supplemented in such a way that tax bases and rates were harmonised and the excess credit made repayable. This is not impossible in an integrated area like the EU, possibly through the adjunction of an interjurisdictional clearing mechanism. In the absence of such supplements the German move obeys the change in the vision of integration and the need to eliminate discrimination among shareholders from different jurisdictions of residence.

Especially, as long as individual shareholders are concerned, the system can be made consistent with the subsidiarity principle which commands that, if possible, tax rates be determined by the member jurisdictions independently, including the right to decide for a global system and the Haig-Simons view of equity. In that case cross border exchange of information has to be set up in the same line as it has been decided for interests at EU level¹⁹.

Unlike imputation, *exemption can be made a perfectly integrated tax system if combined with cash flow tax and harmonised - or approximated - tax rates and bases at affiliate jurisdiction level*. If this is the case that system can avoid strategic use of transfer pricing and delocation of production or sales for tax purposes while keeping tax bases computed separately. Obviously harmonisation of tax rates goes beyond the objective of the EU Commission ; however perfect integration implies that the rates be decided au Union level ; this is inherent to a system based on the source principle.

Replacing the computation of separate tax bases by the one of a *consolidated tax base with an apportionment formula* doesn't *per se* eliminate incentives to tax shifting and thus to transfer pricing strategies and location moving of sales or production for tax purposes. The consolidated base with apportionment

¹⁸Within the European Union, imputation has been recently abolished not only in Germany - since January 1, 2001 - but also in Ireland and, *de facto*, in the United Kingdom - both since April 6, 1999 -. However it is still at work in Finland, France, Italy, Portugal and Spain.

¹⁹On exchange of information see a.o. Bachetta and Espinoza (1995, 2000), Eggert and Kolmar (2000, 2001) and Huizinga and Nielsen (2000).

system can do that only if it is *supplemented with an harmonisation of the bases and rates across jurisdictions although perfect integration also calls for cash flow tax and other financial neutrality requirements as under the imputation system.*

Since perfect integration has the same requirements under both imputation and consolidation with apportionment, what is to be gained from implementing the latter rather than the former ? However, while implementing the latter has certainly a compliance cost both for the multijurisdictional firm and the administrations, it also exhibits an advantage, i.e. to *offset losses*.

Finally, since in any case harmonisation of bases and rates is needed, *why not tax multijurisdictional firm at Union level and apportion the revenue according to aggregate criteria*, possibly turning corporate taxation to an inter-jurisdictional redistributive instrument. This is at least an avenue to explore. Another one should be to come back to the different steps set forth above in order to evaluate the potential welfare gain generated by each of them.

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