

Should countries control international profit shifting?

Susana Peralta*, Xavier Wauthy† and Tanguy van Ypersele‡

April 2004

Abstract

We present a fiscal competition model with two policy decisions: the level of corporate taxation and whether or not to control the multinational firms' (MNF) profit shifting activities. MNFs shift profits from high to low tax countries by manipulating transfer prices. We show that a country may optimally decide not to monitor the MNF for two reasons. Firstly, it becomes an attractive location for the MNF even with a high corporate tax. Secondly, the mobility of the MNF's profits increases, shifting the focus of tax competition. Taxation then influences both the MNF's location and the place where it declares its profits.

Keywords: Taxation of multi-national firms, profit shifting, transfer prices, tax competition, equilibrium existence

JEL Classification: H71, R38, R50, F23

*CORE-UCL. 34, Voie du Roman Pays 1348 Louvain-la-Neuve, Belgium. peralta@core.ucl.ac.be

†CEREC, F.U.S.L. and CORE-UCL. 43, Boulevard du Jardin Botanique 1000 Brussels, Belgium. xwauthy@fusl.ac.be

‡Corresponding author. Université de la Méditerranée, CORE, GREQAM et CEPR. Chateau La Farge Route des Milles 13290 Les Milles, France. Phone: +33(0)442935983; Fax: +33(0)442930968. tanguy@fundp.ac.be

1 Introduction

Competition to attract mobile firms creates a downward pressure on profit taxation. As a consequence, the fiscal burden tends to be transferred out of mobile capital into immobile labor and domestic small and medium firms, less likely to move in response to changes in taxation. Both the European Union and the OECD have reacted to this tendency by recommending both tax coordination efforts among countries and the non-use of discriminatory taxation (European Communities (1992, 1998), OECD (1998)). One of the reasons why countries accept to commit to this non discrimination principle is that it increases the fiscal cost of attracting firms via tax cuts, thereby alleviating the downward pressure on profit taxation. However, each country would still like to offer targeted fiscal breaks. Therefore one may expect fiscal authorities to use other instruments as indirect discrimination devices.

Multinational firms may take advantage of tax differentials by manipulating local profits in various ways, the so-called *profit shifting* behavior. There are several tools at the firms' disposal to shift profits out of high tax into low tax regions. For instance, the choice to finance an affiliate with debt or equity is not a tax-neutral decision. Neither is the organizational form (e.g. to own the affiliate or to engage in a joint-venture with some local firm) or the payment of management fees or royalties between the parent company and its affiliates. The manipulation of transfer prices (i.e. the prices that are used for intrafirm international trade in goods and services) is another widely used instrument. In principle, firms should comply with the "arm's length principle", recommended by the OECD (1995), according to which intrafirm trade should be priced as if it were conducted between independent firms (i.e. use the market price). However, there is extensive evidence of transfer price manipulation. See Hines (1997,1999) for comprehensive surveys of the empirical literature. Clausing (2003) uses explicit observations of both intrafirm and non intrafirm (market) prices of US international trade. She concludes that export (import) intrafirm prices do increase (decrease) with the tax rate of the destination (origin) country as compared to the market ones.

The following quotation from *The Economist* nicely illustrates that the transfer pricing issue is on the political agenda of governments. *In theory the transfer price is supposed to be the same as the market price between two independent firms (...). So multinationals spend a fortune on economists and accountants to justify the transfer prices that suit their tax needs. Increasingly, firms try to restructure their operations to get their tax bill down as far as possible. There are plenty of opportunities: according to the OECD, around 60% of international trade involves transactions between two related parts of multinationals. But tax authorities are increasingly looking out for such wheezes. In America, in particular, the taxman has been putting the squeeze on companies, which have responded by allowing more of their taxable profits to arise there to keep him happy. This is prompting other countries to get tougher, too.* (*The Economist*, 2000) From the point of view of governments, being tougher may entail a cost if multinational firms respond by delocalizing. The point we want to make in this paper is that a country may be appealing to multinational firms simply because it offers them a greater latitude to manipulate transfer prices. In particular, it may attract the firm even with a high profit tax if it is totally loose in this respect, allowing the firm to shift all its profits to lower tax regions. There is evidence that countries do differ in how much they enforce transfer pricing rules. Bartelsman and Beetsma (2003) show that transfer pricing related rules in each country differ as to their strictness. Some countries simply have some transfer pricing regulatory provisions, others go further in requiring that firms prepare and maintain written documentation to justify their transfer pricing decisions. An even smaller subset of countries imposes specific penalties if the firm is found not to be in compliance with the transfer pricing rules. Moreover, the enforcement seems to play a role in the transfer pricing behavior of firms. The authors perform a multi-country analysis of profit shifting among 16 OECD countries and they conclude that (i) there is robust evidence of transfer pricing manipulation in response to tax differences and (ii) profit shifting decreases with the degree of enforcement of the country.

We model this possibility of differing in the control of transfer prices. If countries

cannot directly discriminate profit taxation of multinational firms (MNF) against immobile domestic ones, the cost to attract the MNF with low taxes is high. Indeed, it consists of (almost) completely giving up on profit taxation from domestic firms. Deciding not to enforce the arms' length principle may be an optimal decision: it allows the government to host a MNF while keeping high profit taxes on domestic firms. We consider a multistage game where before deciding profit tax rates, governments decide how much to control the MNF transfer pricing behavior. Announcing a loose monitoring policy in the first stage of the game is a way for governments to change the focus of tax competition in the second one. If the MNF is not allowed to shift profits, it responds to tax differences by changing its location; if on the other hand it may do so, then its location no longer depends on tax differences, but its decision of where to declare its profits does. The choice of the control policy determines whether countries will compete for the firm or for its profit. Out of the possible gains linked to localization (increase in the wage bill, decreasing unemployment, agglomeration externalities,...), our model relies on savings in transport costs. Households of the country hosting the firm enjoy a higher consumer surplus as no transport cost have to be incurred.

Our paper features three aspects which have not, to the best of our knowledge, been simultaneously studied in the literature. One is more general: we provide a detailed analysis of the nature of tax competition when fiscal authorities cannot discriminate among tax bases with different elasticities. In a way, tax competition becomes less intense, though more unstable. Janeba and Peters (1999), already pointed out this implications of non-discrimination. However, they provide a partial analysis of the tax equilibrium. Their objective, as that of Keen (2001) is different from ours in that they compare the relative merits of discriminatory vs non-discriminatory taxation.¹ The two others contributions are specific to the transfer pricing literature. On the one hand, while we fix a very simple transfer pricing rule (equal to marginal cost of production), *we let the countries decide on whether or not to enforce it*. On the other hand, *location is not given* and it is not trivial due to the existence of a *transport cost*.

¹The authors thank Ben Lockwood for attracting our attention to these references.

We show that in a subgame perfect equilibrium, at most one country is loose on control. Typically, the one that benefits from a "location" advantage. Countries do not engage in a run to the bottom on this policy instrument, unlike the widely known result on tax competition (see e.g. the survey by Wilson, 1999) nor do they always engage in a run to the top, unlike usual results on transfer pricing regulations for immobile multinationals (Raimondos-Møller and Scharf (2002), Mansori and Weichenrieder (2001)). E.g., the former paper takes location of the multinational as given and takes for granted that it will respect the transfer pricing rule fixed by the government. In this context, governments set transfer pricing rules which lead to excess effective taxation and depressed international trade - a race to the top. The fact that when competition in tax rates is banned, countries may have an incentive to be less stringent in the application of tax laws has been obtained by Cremer and Gahvari (2000). They model countries competing both in indirect taxation of a consumption good (collected by firms) and on audit probabilities and show that auditing probabilities are cut in response to a ban in tax competition. Other papers linked to ours include Elitzur and Mintz (1996), who address tax competition when transfer prices are used both to shift profit and as a strategic device to give proper incentives to the affiliate. Haufler and Schjelderup (2000) show that full deduction of investment expenditures may not be optimal for an open economy hosting MNEs who shift profits by manipulating transfer prices. Kind et al. (2001, 2002) also study tax competition in a profit shifting setting. They introduce transport costs and foreign property of the MNE and show under which circumstances economic integration (a decrease in the former and/or an increase in the latter) leads to a decrease in corporate taxation.

The paper is organized as follows. Section 2 presents the model and basic derivations. We compute the subgame perfect equilibrium and present results in section 3. Finally, we conclude in Section 4.

2 The Model

2.1 The Firm

We consider a partial equilibrium model in which two regions denoted 1 and 2 compete for a single multinational firm. For simplicity, we consider that the multi-national operates as a monopolist in each market, a linear demand $q_i(p_i)$ where p_i and q_i are the price and quantity prevailing in region i .

The firm sets its production plant in one of the regions and a sales-office in the other. We will often refer to the production plant as the firm's headquarters or simply *the firm* and to its location as *home*. Analogously, *abroad* designates the location of the sales-office. Each branch pays taxes locally. The plant produces a good at a constant marginal cost. Shipping the good from one region to the other costs τ per unit.

The firm sets quantity as to maximize its gross-of-tax profit. Due to the existence of positive transport costs, it sets a higher price (and sells a lower quantity) abroad than home. The firm realizes an actual profit in each of the locations, which we shall denote Π_h - the profit of the production plant - and Π_f - the profit of the sales office. Quite clearly, $\Pi_h > \Pi_f$ whenever $\tau > 0$. Note also that while Π_h is independent of the transport cost, Π_f depends negatively on τ .

The firm has to impute its cost of production between the headquarters and the sales-office by setting a constant transfer-price at which the headquarters sell the good to the sales office. The "arm's length principle" recommends the transfer price to be equal to the marginal cost of production. Nevertheless, the firm can manipulate it to shift profit from the high to the low tax region. By increasing the transfer price, the firm shifts profits from the sales office into the production plant. This means that the declared profit in each region may differ from the actual profit. We shall use π_h and π_f to denote the declared profits of the production plant and the sales office, respectively.

The net of tax MNF profit is given by

$$(1 - t_h)\pi_h + (1 - t_f)\pi_f \tag{1}$$

The MNF compares its profit when home is country 1 with the one it has when home

is country 2 and choose location accordingly. We assume that when it is indifferent, it chooses region 2. This preference for region 2 may be due to any (however small) advantage from region 2 (or conversely cost in region 1), as e.g. a marginal difference in the population size.²

2.2 The government

Each government faces a trade-off between the advantage of hosting the firm and the fiscal cost of attracting it. The advantage is the increase in the consumer surplus due to the absence of transport costs. The fiscal cost stems from the marginal cost of public funds. Implicitly, we have in mind a general equilibrium model where governments tax different sources besides company profits (like labor and consumption) to balance a fixed budget and when decreasing profit taxation they have to increase other forms of taxation.

The trade-off we want to model is captured by the following reduced form of the government's objective function, where we have normalized the marginal cost of public funds to unity:

$$CS_i + T_i \tag{2}$$

where CS_i is the consumer surplus and T_i is the profit tax revenue of region i .³

The consumer surplus will be higher if the country hosts the firm (CS_h) than in the case it only hosts the sales office (CS_f). This is the reason why in this model a given country prefers to be the home one than the foreign one. Obviously, CS_h is independent of τ whereas CS_f is decreasing, therefore the consumer surplus advantage to host the firm is increasing in the level of transport costs.

²This assumption plays an important role. We use it to avoid having our results based on the perfect symmetry of the regions, as they would be non-robust to a slight change in the model. In the extensions section, we solve the model without this assumption and discuss its implications.

³This specification for the government's objective function would be obtained in a model in which consumers have quasi-linear preferences and the government redistributes fiscal revenue to the representative consumer (if preferences are linear in a composite good and quadratic in the good sold by the MNF).

The government has two policy instruments: the profit tax t_i and the control policy δ_i .

The government may either control or not the transfer price decision of the firm. We use the terms control and monitor interchangeably to refer to the policy of government i , δ_i . When it does not control, we say it is *loose* ($\delta_i = L$). When it chooses to control, we say it is *strict* ($\delta_i = S$). This policy is assumed to refer only to outgoing profit and not to incoming one. That is, regional governments are always eager to have an enlarged tax base (through repatriated profits from foreign regions) and could only worry about seeing their tax base diminished. This implies that only the high tax region policy affects the firm's decision. We shall refer to this policy as the *effective policy*. To simplify the analysis, we assume that if the effective policy is strict, the cost is dissuasive and therefore the firm does not manipulate the transfer price at all. If it is loose, there is no manipulation cost and the firm transfers all its profit to the low tax region. We make the simplifying hypothesis that the cost of implementing a monitoring policy is zero.⁴

The same profit tax must apply to both the multinational firm and domestic firms. We shall refer to the profits of the latter as the *domestic tax base*. The size of domestic tax base determines the cost to attract the firm. The larger it is, the more funds have to be collected from other sources when the profit tax decreases. We keep things simple by considering an inelastic domestic tax base but we allow it to differ across regions.⁵ We let R_i denote the domestic tax base of region i with $R_1 = R$ and $R_2 = \gamma R$, and $\gamma \in [0, \infty]$. Governments may subsidize as much as they want but they cannot tax more than the existing tax base: $t_i \leq 1$ for $i = 1, 2$.

⁴We show that even under this hypothesis, it may happen that the government will make no effort at equilibrium. Extending the model to allow for a cost of monitoring would, if anything, make the loose policy more likely.

⁵The alternative of an elastic tax base is discussed in the extensions section, where we conclude that our results would be qualitatively similar under this alternative assumption.

The profit tax revenue of each government is given by:

$$\begin{aligned} T_i &= t_i(R_i + \pi_h) \text{ if the firm locates in } i \\ T_i &= t_i(R_i + \pi_f) \text{ if the firm locates in } j \end{aligned}$$

Substituting T_i into (??) one gets the payoff of each regional government. We denote the payoff of region 1 by u_i and the payoff of region 2 by U_i , where the $i = h, f$ accordingly to where the firm locates. Letting t denote the tax vector (t_1, t_2) and δ the control vector (δ_1, δ_2) , we have, for region 1:

$$\begin{aligned} u_h(t, \delta) &= CS_h + t_1(R + \pi_h) \\ u_f(t, \delta) &= CS_f + t_1(R + \pi_f) \end{aligned} \tag{3}$$

Similarly, for region 2:

$$\begin{aligned} U_h(t, \delta) &= CS_h + t_2(R\gamma + \pi_h) \\ U_f(t, \delta) &= CS_f + t_2(R\gamma + \pi_f) \end{aligned} \tag{4}$$

3 Equilibrium

The game is played in three stages. In the first stage, governments choose δ_1 and δ_2 . Then they set t_1 and t_2 .⁶ Governments decide simultaneously. In the third stage the firm decides where to locate and finally production and consumption take place.

3.1 Profit shifting and location decision

The firm's decision of where to declare its profits is very simple in this setting. Whenever the effective control policy is loose, the firm declares all its profit in the low tax region.

⁶By choosing this sequence of decisions, we implicitly assume that δ is essentially determined by reputation and therefore is a long-term policy variable.

It can be shown that both regions obtain the same payoffs at equilibrium under the alternative timing, except for region 1 in a small part of the parameter space. Moreover, the control policy choice of region 1. The only substantial difference is that, for intermediate values of τ , the control policy of region 2 will depend on the particular realization of the mixed strategy on taxes of the first stage. (calculations available upon request).

Table 1: After-tax profit and location decision

	$t_1 > t_2$		$t_2 > t_1$	
Effective δ	$\delta_1 = L$	$\delta_1 = S$	$\delta_2 = L$	$\delta_2 = S$
(1) Profit if home is 1	$(1 - t_1)0+$ $(1 - t_2)(\Pi_h + \Pi_f)$	$(1 - t_1)\Pi_h+$ $(1 - t_2)\Pi_f$	$(1 - t_1)(\Pi_h + \Pi_f)+$ $(1 - t_2)0$	$(1 - t_1)\Pi_h+$ $(1 - t_2)\Pi_f$
(2) Profit if home is 2	$(1 - t_1)0+$ $(1 - t_2)(\Pi_h + \Pi_f)$	$(1 - t_1)\Pi_f+$ $(1 - t_2)\Pi_h$	$(1 - t_1)(\Pi_h + \Pi_f)+$ $(1 - t_2)0$	$(1 - t_1)\Pi_f+$ $(1 - t_2)\Pi_h$
(1)-(2)	0	$(\Pi_h - \Pi_f)(t_2 - t_1)$	0	$(\Pi_h - \Pi_f)(t_2 - t_1)$
Localization	Region 2	Region 1	Region 2	Region 1

If on the contrary the firm is subject to a strict control policy, then it has no choice but to declare the actual profit. That is, the declared profit may take one of four values: 0 , Π_f , Π_h or $\Pi_h + \Pi_f$.

The following table shows the after tax MNF profit (??) under each of the possible tax and control policy scenarios. The MNF compares the profit it obtains by locating its production plant in each of the countries and decides location accordingly.

Profit shifting takes place in two cases. Region 1 taxes the total profit if $\delta_2 = L$ and $t_2 > t_1$. Region 2 taxes the total profit in case $t_1 > t_2$ and $\delta_1 = L$. Apart from these situations, the firm declares the actual profit.

Note that δ_1 is irrelevant for the MNF's location decision. This is due to the hypothesis of the firm's marginal preference for region 2. To see that, note that whenever $\delta_2 = L$ the firm will always set up its production plant in 2: it may locate in its favorite region and if the tax is higher there, it may shift its profit to the low tax region. When $\delta_2 = S$, region 1 may decide to be loose. This turns out to be the effective policy only if $t_1 > t_2$; then the firm chooses to locate in 2. Region 1 could otherwise decide to be strict. In that case, it captures the firm if $t_1 < t_2$. In both cases it is the tax difference that determines location and not the value of δ_1 .

Not surprisingly, the region marginally preferred by the firm is better armed to compete for it, as it may use taxes as much as a loose policy while the other region may only compete through taxes. Once $\delta_2 = L$, governments may only compete for

the taxation of the multinational's profit. Region 1 may either choose $t_1 < t_2$ and tax the total profit or it may set $t_1 > t_2$ in which case it will only be capable of taxing the sales office profit by choosing a strict control policy.

3.2 Tax game

In this stage of the game governments simultaneously choose tax rates, given their previous choice of a control policy and anticipating the MNF location decision.

3.2.1 The nature of the tax game

Whatever the monitoring policy choice in the first stage of the game, the payoffs of the tax game have a common feature. The payoff of each country depends on whether its tax is higher or lower than that of the other country. To see this, it suffices to look at Table ?? and expressions () and (). When the control policy vector is δ , then if $t_i > t_j$ country i will be on a given branch of his payoff function, which we denote $\mathcal{H}_i^\delta(t_i)$, to recall that country i has the *high* tax. When $t_i < t_j$, the payoff branch is denote $\mathcal{L}_i^\delta(t_i)$. Note that we always have $\mathcal{L}_i^\delta(t_i) > \mathcal{H}_i^\delta(t_i)$ hence, for a given tax rate, both regions prefer to be the low tax one.⁷ Region i switches from the \mathcal{L}_i^δ to the \mathcal{H}_i^δ branch when $t_i = t_j$. Note also that both \mathcal{L}_i^δ and \mathcal{H}_i^δ are increasing in t_i . Therefore, along the $\mathcal{L}_i^\delta(t_i)$ branch the region will fix its tax as close to t_j as possible and along the $\mathcal{H}_i^\delta(t_i)$ it will set $t_i = 1$. Put otherwise, each region faces a choice between taxing at 1 and being sure to be in its $\mathcal{H}_i^\delta(t_i)$ branch or undercutting the other region and attaining $\mathcal{L}_i^\delta(t_i)$. Notice that $\mathcal{H}_i^\delta(1)$ is the utility the region may obtain whatever the other region's decision. We shall refer to this as *region i 's security utility level*. In each subgame, there is a tax rate t_i that leaves the region indifferent between $\mathcal{L}_i^\delta(t_i)$ and its security utility level. Region i never wants to play a tax rate lower than that one, as it would enjoy a lower utility than what it can guarantee itself by playing $t_i = 1$. We thus denote this tax rate $t_i^{\min \delta}$, formally defined as $t_i^{\min \delta} = \{t_i : \mathcal{H}_i^\delta(1) = \mathcal{L}_i^\delta(t_i^{\min})\}$. Given this fact, $t_i^{\min \delta}$ is a

⁷This is true only for tax rates to the right of the intersection of \mathcal{H}_i^δ and \mathcal{L}_i^δ . However, it is straightforward to show that all taxes to the left of this intersection are dominated.

measure of what we shall call the *aggressiveness* of region i , that is, how low this region is willing to go in undercutting the other. The aggressiveness of the region reflects a tradeoff between the gains and the costs from undercutting.

Notice that, given region j 's strategy, there are two local maxima in region i 's utility. Moreover, the payoffs are discontinuous at $t_i = t_j$. Given this payoff structure, a pure strategy equilibrium cannot exist.⁸ If, say, region 2 has a high tax (i.e. higher than $t_1^{\min \delta}$) then region 1 prefers to undercut it. If, on the other hand, region 2 has a low tax, then region 1 prefers to set $t_1 = 1$ and get its security utility level. However, a unique mixed strategy equilibrium exists in each subgame. The structure of such an equilibrium is summarized in the following proposition.⁹

Proposition 1 *Take subgame δ . If region i is more aggressive than region j (i.e. $t_i^{\min \delta} < t_j^{\min \delta}$) then, at the unique Nash Equilibrium in taxes, region j is held down to its security utility level ($\mathcal{H}_j^\delta(1)$) while region i attains more than its security utility level ($\mathcal{L}_i^\delta(t_j^{\min \delta})$).*

Equilibrium utilities are quite intuitive to interpret. The more aggressive region is able to undercut any tax that the other region is willing to play. Accordingly, in equilibrium, the less aggressive region cannot do better than its security utility level. By undercutting $t_j^{\min \delta}$, region i is sure to be on the \mathcal{L}_i^δ branch of its payoff.

From the above discussion, it is obvious that the main determinant of the equilibrium in taxes is the relative aggressiveness of regions. For a given subgame, relative aggressiveness depends on the fundamentals of the model. For instance, as γ increases, region 2 becomes less aggressive as compared to region 1, because it has more to lose when undercutting in terms of domestic fiscal receipt. When τ increases, the consumer surplus gain increases cost whereas the total profit of the MNF $\Pi_h + \Pi_f$ decreases. When the gains at stake stem from consumer surplus, aggressiveness is increasing in

⁸This payoff structure is actually quite common in economic games. For existence analysis and early examples see Dasgupta and Maskin (1986a, 1986b).

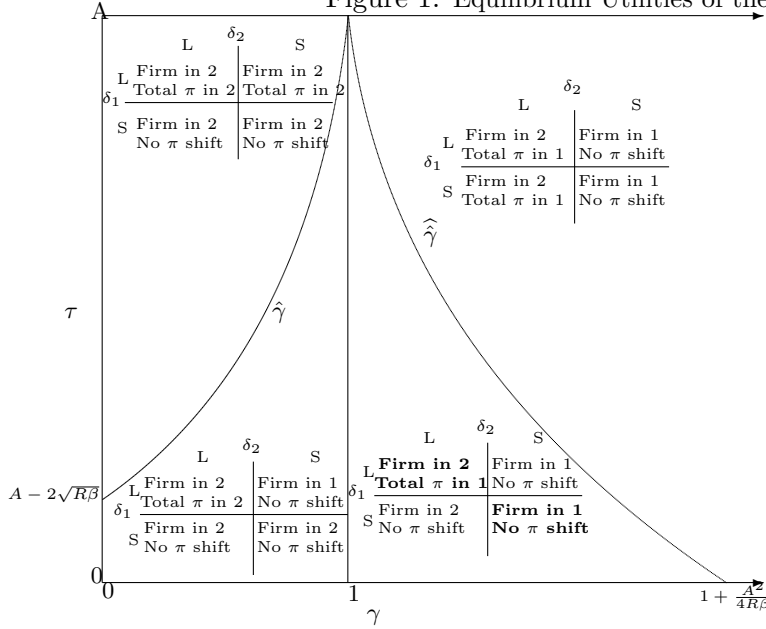
⁹The interested reader is referred to the discussion paper version for a formal of existence and uniqueness of a mixed strategy equilibrium in the present setup.

		Region 1	Region 2
(L, L)	Gain	$t_1(\Pi_h + \Pi_f)$	$t_2(\Pi_h + \Pi_f)$
	Cost	$(1 - t_1)R$	$(1 - t_2)\gamma R$
(S, L)	Gain	$t_1(\Pi_h + \Pi_f)$	$t_2\Pi_h$
	Cost	$(1 - t_1)R + \Pi_f$	$(1 - t_2)\gamma R$
(S, S)	Gain	$CS_h - CS_f + t_1\Pi_h$	$CS_h - CS_f + t_2\Pi_h$
	Cost	$(1 - t_1)R + \Pi_f$	$(1 - t_2)\gamma R + \Pi_f$
(L, S)	Gain	$CS_h - CS_f + t_1\Pi_h$	$CS_h - CS_f + t_2(\Pi_h + \Pi_f)$
	Cost	$(1 - t_1)R$	$(1 - t_2)\gamma R + \Pi_f$

the transport cost and the reverse is true when the gains concern taxation. As suggested by this last sentence, given the fundamentals, relative aggressiveness changes when one passes from one subgame to the other. That is, relative aggressiveness directly depends on monitoring policies as these change the gains and the costs from undercutting. The following table shows each region i 's gain and cost from undercutting when it undercuts with a tax rate t_i . The cost from undercutting comes from two sources. On the one hand, fiscal revenue from the domestic tax base decreases. This cost is equal to $(1 - t_i)R_i$. On the other hand, there is a further cost from undercutting to a strict region hosting the sales office region: it has a fiscal revenue equal to the sales office profit Π_f which is lost when undercutting.

For each subgame, there is a threshold γ above which region 1 is more aggressive than region 2. If $R_1 = R_2$ (i.e. $\gamma = 1$) and one region is strict while the other is loose, the additional cost of losing full taxation of the sales-office profit makes the strict region less aggressive. On the other hand, if regions are both strict or both loose, they are equally aggressive. This reasoning explains why the threshold value of γ is equal equal to 1 under both subgames (L, L) and (S, S) and depends on τ for the other subgames. Since Π_f decreases with τ , an increase in τ decreases the cost to undercut of the strict region. We obtain the thresholds $\hat{\gamma}(\tau) < 1$ for the subgame (L, S) and $\hat{\gamma}(\tau) > 1$ for

Figure 1: Equilibrium Utilities of the Tax Game



the subgame (S, L) , which are drawn on Figure 1.¹⁰ The three thresholds $\hat{\gamma}$, 1 and $\hat{\hat{\gamma}}$ determine four regions in the (γ, τ) parameter space.

We now turn to the regional choice of the control policy.

3.3 Choice of monitoring policy

The total profit of the multinational is decreasing with the transport cost. Economic integration due to a decrease in the transport cost makes it less and less profitable for regions to fight for the location of the firm, while it makes it all the more interesting to compete for the taxation of its total profit.

Figure 1 summarizes the different firm location and profit shifting behavior that we observe at the equilibrium of each subgame.

In order to analyze the control policy choice, let us assume that the control policy of, say, region 1, is given and study what drives the the optimal decision of region 2. From Proposition 1, we know that the only thing that matters for region 2 is relative

¹⁰See discussion paper version for exact derivation of $\hat{\gamma}$ and $\hat{\hat{\gamma}}$.

aggressiveness, i.e., the ranking of $t_i^{\min \delta}, i = 1, 2$ in each subgame δ . In this respect, there are three possibilities. Firstly, region 2 may be less aggressive than region 1 irrespective of δ_2 . This happens when the domestic base of region 2 is sufficiently higher than that of region 1 (i.e. high γ). In this case, region 2's payoff does not depend on region 1's aggressiveness: region 2 chooses the control policy which yields the higher security utility level $\mathcal{H}_2^\delta(1)$. By contrast, for sufficiently low γ , region 2 is for sure more aggressive than region 1 with both possible control policies. In that case, region 2 selects δ_2 as to minimize region 1's aggressiveness (recall that region 2's payoff is given by $\mathcal{L}_2^\delta(t_1^{\min \delta})$). Finally, for intermediate values of γ , the choice of region 2 will make it the most aggressive in one of the subgames and the least in the other. In this case region 2's decision amounts to compare the $t_1^{\min \delta}$ it may play when more aggressive with the $t_2^{\min \delta}$ below which region 2 prefers its security utility level. For instance, say region 1 is strict. Then if $\gamma > \hat{\gamma}$ region 2 is the least aggressive anyway and its choice comes to compare $\mathcal{H}_2^{(S,S)}(1)$ with $\mathcal{H}_2^{(S,L)}(1)$. If $\gamma < 1$, region 2 is the more aggressive in both subgames and it compares $\mathcal{L}_2^{(S,S)}(t_1^{\min(S,S)})$ with $\mathcal{L}_2^{(S,S)}(t_1^{\min(S,L)})$ (note that $\mathcal{L}_2^{(S,S)}(t_2) = \mathcal{L}_2^{(S,L)}(t_2)$ since in both cases region 2 has the firm and there is no profit shifting). When $1 < \gamma < \hat{\gamma}$ then region 2 is more aggressive than region 1 in subgame (S, S) and the reverse happens for subgame (S, L) so it compares $\mathcal{H}_2^{(S,S)}(1)$ with $\mathcal{L}_2^{(S,S)}(t_1^{\min(S,L)})$ or, what amounts to the same, $t_2^{\min(S,S)}$ with $t_1^{\min(S,L)}$.

The interaction of these forces, for both regions, determines equilibrium control choices. The following proposition addresses this issue.

Proposition 2 *In equilibrium, region 1 is always strict. Region 2 is loose for high and strict for low transport costs.*

Proof The proof is given in the Appendix. \square

Let us take region 1. When region 2 is loose, it hosts the firm, and region 1's best reply is to be strict. For small γ , region 1 is less aggressive in both subgames and by playing $\delta_1 = S$ it guarantees itself the taxation of the sales office. As γ increases and it becomes higher than 1, region 1 becomes the more aggressive in subgame (L, L) , which it does not want to play because region 2 is too aggressive in this subgame. Now take

the case under which $\delta_2 = S$. It may be the case that region 1 prefers to be strict, but then region 2 always prefers to deviate further to (L, L) .

We now look at region 2's choice. When $\gamma < 1$, it is more aggressive than region 1 in both subgames (S, S) and (S, L) . It therefore acts as to minimize region 1's aggressiveness: the monitoring policy entails an *aggressiveness effect*. As region 1 competes for the location gain if region 2 is strict and for the total profit gain if 2 is loose, we have that 1's aggressiveness is higher (lower) in the (S, S) subgame than in the (S, L) for high (low) τ .

When $\gamma > 1$, region 2 is no longer capable of hosting the firm in subgame (S, S) and the choice of the control policy corresponds to deciding whether it is profitable to attract the firm by being loose: *the location effect*. Region 2 prefers to host the firm for high τ as loosing it would entail a high cost in consumer surplus and to let go of it for low τ .

However, attracting the firm entails a fiscal cost as with $\delta_2 = S$ region 2 taxes both Π_f and R_2 with a unit tax. This fiscal cost may be attenuated if by getting the firm region 2 is also able to tax its profits, which is made possible if the switch to the loose control policy does not make region 2 the least aggressive. When $1 < \gamma < \hat{\gamma}$, it can do so as the relative aggressiveness of region 1 is lessened in the (S, L) subgame as compared to the (S, S) one. This explains why the threshold τ (see Figure 2) is increasing with γ : the fiscal cost of being loose is both increasing with γ and decreasing with τ . When $\gamma > \hat{\gamma}$, being loose does not have any effect on relative aggressiveness thus the threshold τ remains constant (the choice of δ_2 is in this case motivated by a pure location effect).

Paradoxically, region 1 is able to host the firm only when it does not have that much of an impact in utility. The firm's infinitesimal preference for region 2 gives it the power to host the firm when it is more profitable to do so.

An interesting question to ask is if profit shifting does arise at equilibrium, that is, whether the firm is able to take advantage from the announcement of a loose policy by the government of region 2. The following proposition addresses this issue.

Proposition 3 *Equilibria with profit shifting are such that the multinational locates in*

2 and on average declares its total profit in 1. This type of equilibrium exists for $\tau \geq \tilde{\tau}$ and $\gamma \geq \hat{\gamma}$:

- (i) τ is high enough such that region 2 is loose and hosts the firm and
- (ii) γ is high enough such that region 1 undercuts region 2 on average.

Proof The proof is given in the Appendix. \square

As regards expected utility, three equilibrium types arise: (i) the firm is expected to locate or locates for sure in 2 and pays or is expected to pay all taxes locally; (ii) the firm is expected to locate in 1 and pays all taxes locally; (iii) the firm locates for sure in 2 and is expected to pay all its taxes in 1. Profit shifting arises in the third type of equilibrium, which is characterized by both region 1 being very aggressive and region 2 being very much interested in hosting the firm.¹¹

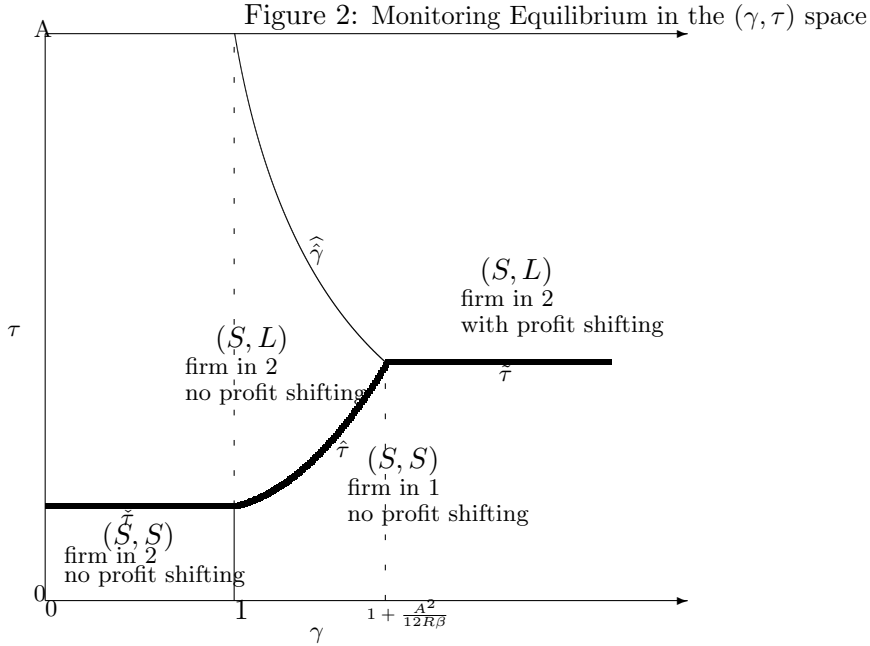
Note that we must have at least $R_2 \geq R_1$ ($\gamma \geq 1$). Region 1 can only capture the firm's total profit if its aggressiveness is sufficiently high. $\hat{\gamma}$ is decreasing in τ as region 1's cost to undercut amounting to the loss of the full taxation of the sales office profit is decreasing in τ . The lower is τ , the smaller has to be R_1 relative to R_2 (the higher γ), for 1 to be more aggressive than 2.

When τ falls below a certain threshold, it is no longer the constraint on 1's aggressiveness but the one on 2 wanting the firm which is active. Region 2 then lets go of the firm (not too bad for low τ) and gets in return the sales office and its profits to tax (high since τ is low) by being strict.

Figure 2 summarizes the findings about the equilibrium choice of the control policy and the (expected) firm location and profit shifting behavior arising under such a choice. The thick line separates different types of equilibrium in terms of monitoring policy.¹² Thin lines separate different types of equilibrium in terms of location and taxation.

¹¹Note that the threshold τ is the one that leaves 2 indifferent between hosting the firm and not taxing it at all or hosting the sales office and taxing it fully.

¹²Analytical expressions for $\tilde{\tau}$, $\hat{\tau}$ and $\tilde{\tau}$ are given in Appendix 2.



4 Final remarks

This paper shows how the leniency of governments in the control of transfer pricing behavior can be used as an instrument that complements profit taxation. Such an instrument is particularly useful when governments cannot discriminate profit taxation of mobile multinational firms against domestic ones. By being lenient on the control of transfer pricing, the government allows the multinational firm to benefit from low effective taxation even if the profit tax prevailing in the country is quite high.

We identify two effects of the monitoring policy: the location and the aggressiveness effects. The first one allows the region to attract the firm by being loose, irrespectively of its tax rate. In this respect, the monitoring policy can be used as a substitute to discriminatory taxation. However, the monitoring policy is more than just a substitute, since it entails an aggressiveness effect: it may be used as a device to relax tax competition.

We have put a lot of structure in our model in order to establish our results. Accordingly, it is only fair to wonder to what extent our conclusions depend on its details. We discuss hereafter a few of its key aspects. Several hypothesis could be relaxed with-

out qualitatively changing the results: the rigidity of domestic tax bases, the number of multinational firms and the market structure. On the contrary, abandoning regional asymmetry (i.e. letting the firm toss a fair coin to decide location when after tax profit is the same in both regions) has important consequences on the conclusions. This is not surprising as it entails a non-trivial change in the payoffs of the game. In particular, region 1 may gain in being loose, as this allows it to attract the firm with some probability.¹³

Our model has clear empirical predictions. Countries with a relatively large domestic tax base are less likely to be loose. Moreover, a decrease in the transport cost makes countries more willing to control profit shifting. Whether these predictions are verified or not is an empirical question that is beyond the scope of this paper. Table 1, shown in the introduction, allows us however to make some (albeit loose) comments. The relatively new emergence of profit shifting laws doesn't contradict the second prediction. The fact that almost all small open economies (at the exception of Denmark) are lenient may be taken as an indication that the first prediction is not contradicted. The precursor role of the US in the implementation of profit shifting rules as pointed out by *The Economist* could also be interpreted in that direction. Nevertheless there are countries like Germany or Italy that could be seen as counter examples.

Acknowledgements

Susana Peralta acknowledges financial support from Sub-Programa Ciência e Tecnologia do 2 Quadro Comunitário de Apoio, Ministério da Ciência e Tecnologia, Portugal. Xavier Wauthy acknowledges financial support from the IAP 5/26 contract. We thank Oscar Amerighi, Jean Hindriks, Maurice Marchand, Pierre Pestieau and two anonymous referees for useful suggestions. Comments by seminar participants at the University of Namur, ERIE conference at Helsinki, Journées de Micro Appliquée, the University of Pescara and KU Leuven are also acknowledged.

¹³The interested reader is referred to the discussion paper version for a full fledged discussion of the possible extensions.

References

- [1] Bartelsman, E. J. and R. Beetsma, 2003, Why Pay More? Corporate tax avoidance through transfer pricing in OECD countries, *Journal of Public Economics* 87, 2225-2252.
- [2] Baye, M., D. Kovenock and C. de Vries, 1992, It takes Two to Tango: Equilibria in a Model of Sales, *Games and Economic Behavior* 4(4), 493-510.
- [3] Clausing, K., 2003, Tax Motivated Transfer Pricing and US Intrafirm Trade Prices, *Journal of Public Economics* 87, 2207-2223.
- [4] Commission of the European Communities, 31-3-1992, Conclusions and Recommendations of the Committee of Independent Experts on Company Taxation (Ruding Report), Brussels.
- [5] Cremer, H. and F. Gahvari, 2000, Tax Evasion, Fiscal Competition and Economic Integration, *European Economic Review* 44, 1633-1657.
- [6] Dasgupta, P. and E. Maskin, 1986, The Existence of Equilibrium in Discontinuous Games, I: Theory, *Review of Economic Studies* LIII, 1-26.
- [7] Elitzur, R. and J. Mintz, 1996, Transfer Pricing Rules and Corporate Tax Competition, *Journal of Public Economics* 60(3), 401-422.
- [8] Ernst and Young, 2000, Transfer Pricing at-a-Glance Guide, Ernst and Young, Rotterdam.
- [9] European Communities, 1998, Conclusions of the ECOFIN Council Meeting on 1 December 1997 Concerning Taxation Policy (including Code of Conduct for Business Taxation). *Official Journal of the European Communities* 98/C 2/01, Brussels
- [10] Janeba, E. and W. Peters, 1999, Tax evasion, tax competition and the gains from nondiscrimination: the case of interest taxation in Europe, *The Economic Journal* 109, 93-101.

- [11] Haufler, A. and G. Schjelderup, 2000, Corporate tax systems and cross country profit shifting, *Oxford Economic Papers* 52, 306-325.
- [12] Hines, J. R., 1997, Tax Policy and the Activities of Multinational Corporations, in Auerbach, A. J., Ed., *Fiscal Policy: Lessons from Economic Research*, Cambridge, M.I.T. Press.
- [13] Hines, J. R., 1999, Lessons from Behavioral Responses to International Taxation, *National Tax Journal* 52(2), 305-332.
- [14] Keen, M., 2001, Preferential regimes can make tax competition less harmful, *National Tax Journal* 54(4), 757-62
- [15] Kind, H. J., H. Knarvik and G. Schjelderup, 2002, *Economic Integration and Taxation of Multinational Corporations*, draft.
- [16] Kind, H. J., H. Knarvik and G. Schjelderup, 2001, Corporate Taxation, Multinational Enterprises and Economic Integration, CEPR discussion paper 2753.
- [17] Kreps, D. M. and J. A. Scheinkman, 1983, Quantity Precommitment and Bertrand Competition Yield Cournot Outcomes, *Bell Journal of Economics* 14(2), 326-337.
- [18] Mansori, K. S. and A.J. Weichenrieder, 2001, Tax Competition and Transfer Pricing Disputes, *Finanz Archive* 58(1), 1–11.
- [19] OECD, 1995, *Transfer Pricing guidelines for Multinational Enterprises and Tax Administrations*, Paris.
- [20] OECD, 1998, *Harmful Tax Competition: an Emerging Global Issue*, Paris
- [21] Raimondos-Møller, P. and K. Scharf, 2002, Transfer Pricing Rules and Competing Governments, *Oxford Economic Papers* 54, 230-246.
- [22] *The Economist*, 2000, Gimme Shelter, 27/01/200.
- [23] Wilson, J.D, 1999, Theories of Tax Competition, *National Tax Journal* 52(2), 269-304.