Transfer Pricing Policy and the Intensity of Tax Rate Competition

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by

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Abstract

This note provides a novel argument why countries may have incentives to allow for some profit shifting to low-tax jurisdictions. The reason is that a tightening of transfer pricing policies by high tax countries leads to more agressive tax rate competition by low tax countries.

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1 Introduction

Recently, the view has become popular that governments should '*crack down on tax havens*' to prevent them from helping multinational firms to avoid tax payments. However, the theory of international taxation provides some arguments that allowing multinationals to shift profits to low tax countries may also have beneficial effects. In particular, if tax policy cannot openly discriminate between more and less mobile capital, it may be welfare-enhancing to allow the owners of more mobile capital to avoid part of their tax payments through the use of tax havens. This idea is based on Keen (2001) and has been elaborated in Peralta, Wauthy & van Ypersele (2006) and Hong & Smart (forthcoming).[1] The intuition is that allowing for some income shifting can be seen as a form of price discrimination which reduces the intensity of harmful tax competition.

In this note, we argue that measures directed against profit shifting to low tax countries may render tax competition more harmful even if there is only one type of capital, i.e. if incentives for (tax) price discrimination are absent. We consider a model where a multinational firm may manipulate transfer prices to shift profits from a high tax country to a low tax country. Governments have two policy instruments: corporate tax rates and transfer pricing guidelines. By tightening the transfer pricing guideline, the high-tax country may reduce the income shifted to the low tax country. However, this induces the low tax country to engage in more aggressive tax rate competition. Therefore, the transfer pricing policy of the high tax country faces a tradeoff between forcing the multinational firm to declare more income domestically and mitigating tax competition.

The next section presents the model. In section 3 we derive our results. Section 4 concludes.

2 The model

Consider a world with two countries, a and b. There is a representative household in each country with a utility function of $U^i = C^i + \eta^i G^i$ with $i = a, b$ where C^i

[1] See also the discussion in Haupt & Peters (2005), Haufler & Bucovetsky (2008) and Slemrod & Wilson (forthcoming).

is private consumption in country i, G^i is a publicly provided good and η^i is the marginal utility of public consumption. As in Keen (2001), we assume that η^i is constant and larger than the marginal utility of private consumption, i.e. $\eta^i > 1$. Private consumption is given by $C^i = D^i + \Pi^i$,where $D^i \geq 0$ is income from some exogenously given source and Π^i is income from firm ownership.

Governments finance G^i through a corporate income tax which is characterized by two parameters: a transfer price guideline $\bar{p}^i$ and a corporate tax rate t^i.

There is a representative multinational firm owned by the household of country a with a headquarter in a and an affiliate in b. The firm produces a good which yields a pretax income of π in country a and requires an input good produced at the affiliate in b and exported to a. For tax purposes, a transfer price p is applied. Transfer prices are determined in two steps. Firstly, country a determines a transfer price guideline denoted by $\bar{p}^a$. Secondly, the firm may deviate from $\bar{p}^a$ and set a transfer price $\tilde{p}^a$. This deviation requires some effort like e.g. hiring tax advice. The cost of deviating from the guideline is given by $\frac{(\tilde{p}^a - \bar{p}^a)^2}{2\mu^a}$ where μ^a is an exogenously given cost parameter. The after-tax profits of the multinational firm are given by

$$\Pi^a = \left(\pi^a - \tilde{p}^a - \frac{(\tilde{p}^a - \bar{p}^a)^2}{2\mu^a} \right) (1 - t^a) + \tilde{p}^a \left(1 - t^b\right) \tag{1}$$

There are three decision stages. At the first stage, country a determines the transfer pricing guideline $\bar{p}^a$. At the second stage, both countries simultaneously set their corporate income tax rates t^i. Each country takes the tax policy of the other country as given. At the third stage, the firm sets the final transfer price $\tilde{p}^a$.

3 Equilibrium and Results

We determine the equilibrium by backward induction, starting with stage three. At this stage, the guideline transfer price $\bar{p}^a$ and the corporate income tax rates are given. The multinational firm maximizes Π^a by setting

$$\tilde{p}^{a*} = \bar{p}^a + \mu^a \left(\frac{t^a - t^b}{1 - t^a} \right) \tag{2}$$

The firm will deviate from $\bar{p}^a$ only if the tax rates in the two jurisdictions differ.

At the second stage, countries set their corporate taxes to maximize the utility of their residents. Consider first country a, where the government budget constraint is given by

$$G^a = t^a \left(\pi^a - \tilde{p}^{a*} - \frac{(\tilde{p}^{a*} - \bar{p}^a)^2}{2\mu^a} \right) \tag{3}$$

The government of a maximizes $W^a = C^a + \eta^a G^a$ over t^a, subject to the constraints in (3) and $C^a = D^a + \Pi^a(\tilde{p}^{a*})$. The first order condition for the optimal corporate income tax rate can be expressed as

$$\frac{\partial W^a}{\partial t^a} = (\eta^a - 1) \left(\pi^a - \tilde{p}^{a*} - \frac{(\tilde{p}^{a*} - \bar{p}^a)^2}{2\mu^a} \right) - \eta^a t^a \left(1 + \frac{\tilde{p}^{a*} - \bar{p}^a}{\mu^a} \right) \frac{\partial \tilde{p}^{a*}}{\partial t^a} = 0 \tag{4}$$

It can be shown that $\partial^2 W^a / \partial \left(t^a\right)^2 < 0$, i.e. the objective function W^a is strictly concave in t^a. As one would expect, increasing the corporate tax rate raises more revenue, given the tax base, but it will induce the firm to shift income to country b through a higher transfer price $\tilde{p}^{a*}$.

Consider next the tax policy of country b which is equivalent to tax revenue maximization. The government's budget constraint is

$$G^b = t^b \tilde{p}^{a*} \tag{5}$$

The optimal tax rate is implied by

$$\frac{\partial W^b}{\partial t^b} = \eta^b \left(\tilde{p}^{a*} + t^b \frac{\partial \tilde{p}^{a*}}{\partial t^b} \right) = 0 \tag{6}$$

Country b's corporate tax is optimal where the elasticity of the tax base ε equals unity: $\varepsilon = \frac{\partial \tilde{p}^{a*}}{\partial t^b} \frac{t^b}{\tilde{p}^{a*}} = 1$. It can be shown that $\partial^2 W^b / \partial \left(t^b\right)^2 < 0$. Equation (6) can be rearranged to

$$t^b = \frac{1}{2}(t^a + \frac{\bar{p}^a}{\mu^a}(1 - t^a)) \tag{7}$$

In the following, we will focus on equilibria where $t^a > t^b$. It is straightforward

to show that such an equilibrium exists if π^a is sufficiently large.[2]

Now turn to the first stage. Given the tax rates, the interests of the two countries with respect to the transfer price guideline are diametrically opposed. The welfare of country a is strictly decreasing in $\bar{p}^a$, $\frac{dW^a}{d\bar{p}^a} = -t^b - (\eta^a - 1)\, t^a < 0$, while the welfare of country b is increasing in $\bar{p}^a$: $\frac{dW^b}{d\bar{p}^a} = \eta^b t^b > 0$. Country a would prefer to set the lowest possible value of $\bar{p}^a$. Things are more complicated, though, if the impact of $\bar{p}^a$ on tax rate competition at stage 2 is taken into account. Here, we may state

Proposition 1 *An increase in the transfer price $\bar{p}^a$ increases the optimal tax rate t^b.*

Proof. See the appendix. ■

Proposition 1 implies that there is a cost of crowding back the taxing rights of the source country by imposing tougher transfer pricing guidelines: If $\bar{p}^a$ declines, country b's tax base declines as well. This creates an incentive to engage in more aggressive tax competition by reducing the tax rate because the decline in the tax base reduces the cost of tax rate cuts.

The effect of a tax cut in country b on the welfare of a is not trivial. On the one hand, it reduces the tax base of a because more income will be shifted from a to b. On the other hand, it increases the after-tax income of the residents of country a. It can be shown, though, that the first effect unambiguously dominates the second, i.e. a tax cut in country b reduces the welfare of country a.[3]

How does an increase in the transfer price affect the optimal tax rate t^a? An increase in $\bar{p}^a$ has a direct negative effect on the tax base size (which *ceteris paribus* leads to a lower t^a), but also reduces profit shifting because of an increase in t^b (which *ceteris paribus* increases t^a). We may state

Proposition 2 *An increase in the transfer price $\bar{p}^a$ increases the optimal tax rate t^a*

[2] To see this, note that, at $t^a = t^b$, $\frac{\partial W^a}{\partial t^a} = (\eta^a - 1)(\pi^a - \bar{p}^a) - \eta^a \frac{t^a}{(1-t^a)}$, which is strictly positive if π^a is sufficiently large.

[3] The effect of a change in t^b on the welfare of country a can be expressed as $\frac{\partial W^a}{\partial t^b} = -\tilde{p}^a + \eta^a t^a \left(1 + \frac{(\tilde{p}^a - \bar{p}^a)}{\mu^a}\right) \frac{\mu^a}{(1-t^a)}$. Using (6), this can be rearranged to $\frac{\partial W^a}{\partial t^b} = \frac{\mu^a}{(1-t^a)}(t^a(\eta^a - 1)(1 - t^a) + \eta^a(t^a - t^b)) > 0$.

i) if $2\left(1-t^a\right)^2-\left(1+t^a\right)\left(1-t^b\right)\leq 0$ *or*
ii) if $2\left(1-t^a\right)^2-\left(1+t^a\right)\left(1-t^b\right)>0$ *and* $(\eta^a-1)<\frac{2t^a\left(1-t^b\right)}{2(1-t^a)^2-(1+t^a)\left(1-t^b\right)}$.

Proof. See the appendix. ■

Thus, a sufficient condition for the transfer price to increase both tax rates t^a and t^b is that country a's preference for the public good is sufficiently small.

The question remains whether country a actually wants to increase $\bar{p}^a$ over the minimum level of zero. Optimal transfer pricing policy implies

$$\frac{\partial W_A}{\partial \bar{p}^a}=t^a-t^b-\eta^a t^a+\left(-\tilde{p}^{a*}+\eta^a t^a\frac{1-t^b}{\left(1-t^a\right)^2}\mu^a\right)\frac{dt^b}{d\bar{p}^a}=0 \tag{8}$$

where we have used (4). Note that $\frac{\partial^2 W_A}{\partial \bar{p}^{a2}}<0$. An increase in $\bar{p}^a$ reduces the firm's tax payments (t^a-t^b) but also reduces tax revenue $(-\eta^a t^a)$. The sum of these two terms is negative. The resulting increase in t^b decreases firm income $(-\tilde{p}^{a*})$ but also increases the tax base due to reduced profit shifting. At $\bar{p}^a=0$, the term in square brackets is strictly positive. Thus, it follows that if, at $\bar{p}^a=0$, the positive effect of an increase in $\bar{p}^a$ due to increased tax rates dominates the income loss, it is optimal for country a to choose a transfer pricing guideline above the lowest possible level.

4 Conclusion

This note demonstrates that countries may have an incentive to allow multinational firms to shift part of their profits to low-tax jurisdictions. The reason is that these jurisdictions will react by increasing their tax rates. Put differently, a tightening of transfer pricing policies may be counter-productive since low-tax jurisdictions may react by further reductions of their tax rates. In so far, the residence country acts like a Stackelberg leader by determining the parameters of the tax competition game.[4] By letting the rival country participate in the tax base, the residence country "buys" higher tax rates and, potentially, higher overall welfare levels. Note that our results also challenge the widespread view that more residence based

[4] A similar argument with respect to minimum tax rates is put forward in Konrad (2009).

taxation mitigates tax competition. In our model, tighter transfer pricing policies do lead to more residence based taxation but also to more aggressive tax rate competition.

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Appendix

Proof of proposition 1

Differentiating (4) and (6) with respect to t^a, t^b and $\bar{p}^a$ and solving for dt^b yields

$$\frac{dt^b}{d\bar{p}^a} = -\frac{1}{\Delta}\left(\frac{\partial^2 W^b}{\partial t^b \partial \bar{p}}\frac{\partial^2 W^a}{\partial \left(t^a\right)^2} - \frac{\partial^2 W^b}{\partial t^b \partial t^a}\frac{\partial^2 W^a}{\partial t^a \partial \bar{p}}\right)$$

where Δ

$$\begin{aligned}\Delta &= \frac{\partial^2 W^a}{\partial \left(t^a\right)^2}\frac{\partial^2 W^b}{\partial \left(t^b\right)^2} - \frac{\partial^2 W^b}{\partial t^b \partial t^a}\frac{\partial^2 W^a}{\partial t^a \partial t^b} \\ &= \eta^b \mu^{a2}\frac{1-t^b}{\left(1-t^a\right)^5}\left[\left(\eta^a - 1\right)\left(1-t^a\right) + 2\left(1-t^b\right)\eta^a + 2t^a\eta^a\right] > 0\end{aligned}$$

Moreover,

$$\begin{aligned}&\frac{\partial^2 W^b}{\partial t^b \partial \bar{p}^a}\frac{\partial^2 W^a}{\partial \left(t^a\right)^2} - \frac{\partial^2 W^b}{\partial t^b \partial t^a}\frac{\partial^2 W^a}{\partial t^a \partial \bar{p}^a} \\ = \; &-\mu^a \eta^b\left[\left(\eta^a - 1\right)\left(\frac{t^a\left(1-t^b\right)^2 + \left(1-t^a\right)t^{b2}}{\left(1-t^a\right)^3}\right) + \frac{\left(1-t^b\right)^2}{\left(1-t^a\right)^3}\eta^a\left(\frac{1+2t^a}{1-t^a}\right)\right] < 0\end{aligned}$$

from which follows $\frac{dt^b}{d\bar{p}^a} > 0$.

Proof of proposition 2

Differentiating (4) and (6) with respect to t^a, t^b and $\bar{p}^a$ yields

$$\frac{dt^a}{d\bar{p}^a} = -\frac{1}{\Delta}\left(\frac{\partial^2 W^a}{\partial t^a \partial \bar{p}^a}\frac{\partial^2 W^b}{\partial \left(t^b\right)^2} - \frac{\partial^2 W^a}{\partial t^a \partial t^b}\frac{\partial^2 W^b}{\partial t^b \partial \bar{p}^a}\right)$$

where

$$\begin{aligned}&\frac{\partial^2 W^a}{\partial t^a \partial \bar{p}^a}\frac{\partial^2 W^b}{\partial \left(t^b\right)^2} - \frac{\partial^2 W^a}{\partial t^a \partial t^b}\frac{\partial^2 W^b}{\partial t^b \partial \bar{p}^a} \\ = \; &\frac{\eta^b \mu^a}{\left(1-t^a\right)^3}\left[\left(\eta^a - 1\right)\left(2\left(1-t^a\right)^2 - \left(1-t^b\right)\left(1+t^a\right)\right) - 2t^a\left(1-t^b\right)\right]\end{aligned}$$

from which follows Proposition 2.

Appendix for referees (not for publication)

Optimal tax policy in country a is implied by $\frac{\partial W^a}{\partial t^a} = 0$. The second-order condition is

$$\frac{\partial^2 W^a}{\partial \left(t^a\right)^2} = -\mu^a \frac{\left(1-t^b\right)^2}{\left(1-t^a\right)^3}\left[\left(\eta^a - 1\right) + \eta^a \frac{1}{1-t^a} + \eta^a \frac{2t^a}{1-t^a}\right] < 0$$

Optimal tax policy in country b is implied by $\frac{\partial W^b}{\partial t^b} = 0$. The second-order condition is

$$\frac{\partial^2 W^b}{\partial \left(t^b\right)^2} = -\eta^b \mu^a \frac{2}{1-t^a} < 0$$

We can show that tax rates are strategic complements

$$\begin{aligned}
\frac{\partial^2 W^a}{\partial t^a \partial t^b} &= \frac{1-t^b}{\left(1-t^a\right)^3}\mu^a\left[\left(\eta^a - 1\right) + t^a + \eta^a t^a\right] > 0 \\
\frac{\partial^2 W^b}{\partial t^b \partial t^a} &= \eta^b \mu^a \frac{1-2t^b}{\left(1-t^a\right)^2} > 0 \quad \text{if } t^b < 0.5
\end{aligned}$$

Note also that

$$\begin{aligned}
\frac{\partial^2 W^a}{\partial t^a \partial \bar{p}^a} &= -\left(\eta^a - 1\right) \\
\frac{\partial^2 W^b}{\partial t^b \partial \bar{p}^a} &= \eta^b
\end{aligned}$$

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