

# Cross-Border Acquisitions and Taxes: Efficiency and Tax Revenues

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## Abstract

We develop a theoretical oligopoly model to study how international differences in profit and capital gains taxes affect incentives for foreign acquisitions. We find that reductions in foreign profit taxes tend to trigger inefficient foreign acquisitions, while reductions in foreign capital gains taxes may trigger efficient foreign acquisitions. Moreover, foreign acquisitions can increase domestic tax revenues. The reason is that in the bidding competition between foreign firms, all benefits from the acquisition, including tax advantages, are competed away and are captured by the domestic seller which, in turn, pays capital gains tax on the proceeds. Technical issues in the tax code, such as the treatment of goodwill deductibility, are also shown to crucially affect the pattern of foreign acquisitions.

*Keywords:* Capital Gains Tax, Profit Tax, Ownership, Tax revenues, FDI, M&As.

*JEL classification:* F23

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## 1. Introduction

Foreign direct investments (FDI) play a key role in today's global economy. While many governments welcome de-novo entry by foreign firms, there is some concern about the effects of foreign takeovers.<sup>1</sup> For instance, the rumors about a takeover bid of the French dairy producer Danone by the American company PepsiCo provoked an outcry in the French political arena, some politicians swearing to protect this French company from any foreign takeover.<sup>2</sup> Similar concerns have recently been expressed in several countries including Canada, China and USA.<sup>3</sup> One of the major concerns among policy makers is that foreign owners will run the firms less efficiently and invest less in the future than would domestic owners. But how can a foreign owner afford to acquire a domestic firm when running it less efficiently? This paper examines whether tax advantages for foreign owners (firms) can constitute such an explanation.<sup>4</sup>

In many countries, among these the United States and many European countries, income from equity-financed corporate investment is taxed twice: at the corporate level, a tax is levied on net profits and, at the shareholder level, dividends and realized capital gains are subject to a personal capital gains tax. Our formalization of the tax system corresponds to such a double taxation system.<sup>5</sup> More specifically, we assume that a domestic owner who keeps the ownership of the domestic firm pays a profit tax on the firm profits and a capital gains tax on the remaining proceeds. If the domestic owner sells its firm, it pays a capital gains tax on the acquisition price. A foreign owner pays the domestic profit tax

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<sup>1</sup> At the end of the 1990's, nearly 90 percent of the FDI transactions in developed countries were cross-border mergers and acquisitions (M&As).

<sup>2</sup> A few weeks later, the French government officially proposed to shield ten "strategic" industries, including biotechnologies, secure information systems, casinos and the production of vaccines, from foreign acquisitions; see, for instance, *International Herald Tribune, Business*, "Bank chief in Italy off EU hook?", September 17, 2005.

<sup>3</sup> See "China adopts anti-monopoly law" August 30, 2007, *China Daily*, "Canadians worried about foreign takeovers, want action: poll", Friday, September 7, 2007, CBCnews, and "America for sale, 2 outcomes when foreigners buy factories", April 7, 2008, *The New York Times*.

<sup>4</sup> See, for instance, the discussion in Henrekson and Jakobsson (2003).

<sup>5</sup> See Sørensen (1995). For a discussion of the Swedish system, see Lodin et al. (2001).

on the profits in the host country, unless transfer pricing is used in order to pay profit tax in the foreign country and it pays a capital gains tax in the foreign country. Moreover, in our model, there are several foreign oligopolistic firms that may acquire a domestic firm, and where the foreign owners may be more or less efficient than the domestic owner in using the domestic assets. Foreign firms also have the option of investing greenfield in new assets.

We first show that reductions in foreign profit taxes tend to induce inefficient foreign acquisitions, when a foreign owner can use transfer pricing to transfer its profits to a foreign country with a lower profit tax.<sup>6</sup> If a foreign firm evades domestic taxes, profits are shifted to a low tax location. This tax advantage implies that foreign acquisitions leading to less efficient production can be profitable.

Then, we show that reduced foreign capital gains taxes may trigger efficient foreign acquisitions when goodwill associated with an acquisition is not fully deductible (where goodwill is defined as the part of the acquisition price above the value of deductible assets in the acquired firm).<sup>7</sup> The reason is that in our setting, capital gains taxes are neutral to a domestic owner's decision to sell since the capital gains tax is paid regardless of whether the domestic owner sells or keeps the assets, whereas a foreign owner pays capital gains taxes on the net profit if it acquires the domestic firm.

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<sup>6</sup> See Caves (1996) and the references therein for theoretical contributions to the literature on transfer pricing. Bartelsman and Beetsma (2000) find evidence of tax differences having a significant impact on where incomes are declared. See also the references in World Investment Report (WIR) 1998.

Bernard, Bradford Jensen and Schott (2006) find that export prices for intrafirm transactions are significantly lower than prices for the same good sent to an arm's-length customer. Moreover, they find that this wedge is much larger for differentiated than for undifferentiated goods and that it is larger for larger firms. This indicates that transfer pricing is indeed important in markets characterized by oligopolistic competition. Further, they find the wedge to be negatively associated with destination-country corporate tax rates, which is consistent with tax avoiding transfer pricing.

<sup>7</sup> Dunne and Ndubizu (1995) report that acquisitions are associated with different international accounting and tax treatments for goodwill and that these have also changed over time.

Next, we turn to the issue of how FDI affects domestic tax revenues. There is a concern that foreign acquisitions will lead to increased tax evasion and thereby to reduced domestic tax revenues.<sup>8</sup> We first establish that there is a fundamental difference between FDI by acquisition and by greenfield investments with respect to their effect on tax revenues. When a foreign firm undertakes greenfield entry, it will pay a fixed entry cost only covering the opportunity cost in terms of factor inputs. No additional domestic capital gains are created, which is in contrast to acquisition entry where an increase in taxable capital gains occurs due to the foreign takeover. To see this, note that if the complementarities between foreign and domestic assets are sufficiently large, a surplus is created when the domestic assets are transferred to a foreign owner. Then, due to the bidding competition between foreign owners for buying these assets, the surplus is captured by the owners of the target firm.

In particular, we demonstrate that this "rent capturing effect" can be so strong that a foreign acquisition can lead to increased domestic tax revenues, even if the foreign owner fully evades all taxes.<sup>9</sup> The reason is that the sellers end up paying substantially more taxes since the capital gain from selling is substantially higher than the profit from keeping the assets.<sup>10</sup>

While there is no empirical work directly analyzing the mechanisms we describe, Desai and Dharmapala (2008) document that firm value is increasing in firm-level tax avoidance. Moreover, the tax revenues generated by foreign acquisitions may be substantial which is illustrated by the takeover of the Swedish car manufacturer Volvo by FORD in 1999. The stock price reactions to the acquisition process are shown in Figure 1.1. From the time of the first serious rumor on December 18, 1998 (Dagens Industri, December 22, 1998) until

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<sup>8</sup> See, for instance, the discussion in World Investment Report (WIR) 1998.

<sup>9</sup> It is an established fact that most benefits from a takeover accrue to the owners of the target firm (Andrade et al., 2001). It has also been shown that there is a seller premium in cross-border M&As; see, for instance, Cebenoyan et al (1992), Dewenter (1995) and Harris and Ravenscraft (1991).

<sup>10</sup> Kant (1990) shows that transfer pricing can increase an MNE's global tax payment in a setting where MNEs pay both profit and export taxes.

the date when the acquisition was announced, January 28 1999, Volvo's stock market value increased by 21 percent more than the general index (SIRXX). Since 56 percent of the stocks in Volvo were owned by Swedes (Sundin and Sundqvist, 1998), the future Swedish expected capital gains tax revenues increased by 210 million Euro (about ten percent of the total net taxes on capital income in 1999). In the light of our model, the later developments are interesting. In December 2002, Volvo Cars, now an affiliate of FORD, was ruled to pay an additional tax of 196 million Euro. The reason was that a claimed deduction of royalties to the mother company FORD was denied by the local tax office (*Dagens Industri*, December 11, 2002). As the royalty payments had begun immediately after the takeover, these figures suggest that the gains from profit shifting were – at least to some extent – incorporated in the acquisition price.<sup>11 12</sup>

As to the effect of tax policies on takeover activity, there is evidence supporting the main results in this paper. Auerbach and Hassett (1993), for example, find that inward foreign M&A increases in response to increased US corporate profit taxes while no such effect is found for greenfield entry. Without discriminating between foreign M&A and greenfield entry, Swenson (1994) also finds FDI to be increasing in US corporate tax rates – a finding which is hard to reconcile in models without tax avoidance. Few empirical studies analyze the effect of capital gains taxation on takeovers and, in particular, we are not aware of any paper analyzing these effects for cross-border M&As. Indeed, in a survey, Graham (2003) concludes that little is known concerning the impact of capital gains taxes on asset prices and existing research has reached contradictory results.

The related theoretical literature on FDI and taxes is surveyed in Navaretti and Venables (2004). However, this literature does not explicitly address the tax effects of the

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<sup>11</sup> Since profit taxes are lower in Sweden than in the US, there are no direct tax benefits from this transfer. However, the IRS is known to be aggressive when it comes to taxing foreign profits and hence, the transfer was of value to FORD.

<sup>12</sup> Most benefits from a takeover accrue to the owners of the target firm. See Andrade et al. (2001) for an overview and see Cebenoyan et al. (1992), Dewenter (1995) and Harris and Ravenscraft (1991) for evidence on cross-border M&As.

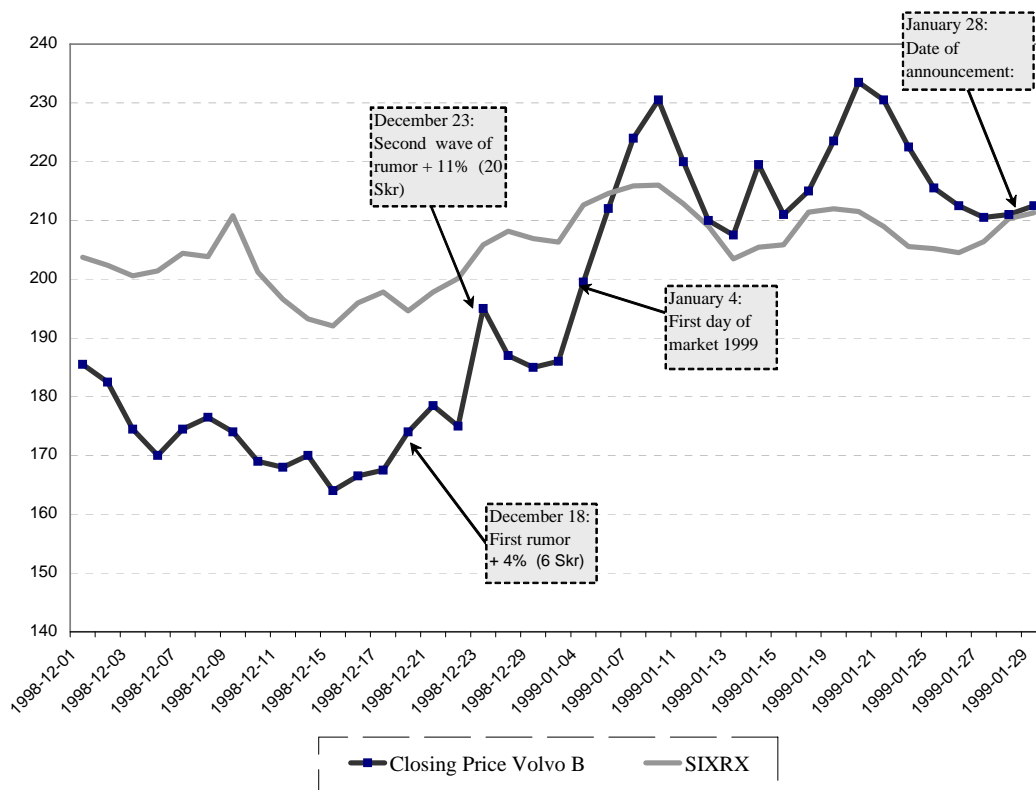


Figure 1.1: The stock price reactions to the acquisition of the Swedish car producer Volvo by FORD.

different entry modes: greenfield, acquisition, or both.<sup>13</sup> We add to this literature by providing a model where foreign taxes affect the entry mode. There is also a small theoretical literature addressing the welfare aspects of cross-border M&As in international oligopoly markets.<sup>14</sup> Our paper extends this literature by allowing foreign acquisitions to affect domestic tax revenues.

The paper is also related to the literature on tax competition and FDI. There are some recent papers studying tax competition when acquisitions are possible. Haufler and Schulte (2007) analyze how nationally optimal tax rates will be adjusted in response to a national merger on the one hand and an international merger on the other. Becker and Feust (2009) study what optimal repatriation tax systems look like when foreign investment takes place through an acquisition instead of a greenfield investment. Becker and Feust (2008) study how tax competition is affected by the fact that foreign investors cannot only invest greenfield, but also by acquisitions. We add to this literature by endogenizing the acquisition pattern and the acquisition price in an oligopolistic setting, while treating tax policies as exogenous.<sup>15</sup>

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<sup>13</sup> See, for instance, Mattoo, Olarrega and Saggi (2004), Klimenko and Saggi (2005) and Norbäck and Persson (2005, 2007) for papers addressing welfare aspects and the choice of entry mode. However, none of these papers includes taxes.

<sup>14</sup> This literature includes papers by, for example, Falvey (1998), Head and Reis (1997), Horn and Persson (2001), Lommerud, Straume and Sorgard (2005), Neary (2003) and Saggi and Yildiz (2005).

<sup>15</sup> See Wildasin and Wilson (1991) for an overview of the public finance literature on this topic. There **are** some papers studying tax competition when MNEs can use transfer pricing. See, for instance, Haufler and Schjelderup (2000) and Raimondos-Moller and Scharf (2002). However, to our knowledge, no paper in that literature allows foreign entry to affect domestic asset prices.

There is also an international trade literature on this topic; see, for instance, Fumagalli (2003) and Haufler and Wooton (1999).

## 2. The Model

Consider a host country,  $H$ , where the market has previously been served by a single domestic firm, denoted  $d$ , possessing one unit of domestic assets, denoted  $\bar{k}$ . This market will now be exposed to international competition through investment liberalization. There are  $M$  symmetric foreign firms in the world market, which do not initially have any assets in country  $H$ , but which might now invest by an acquisition of firm  $d$  or through investing greenfield in new assets in country  $H$ .

The interaction takes place in three stages. In stage 1, the foreign firms might acquire the domestic firm's assets. In stage 2, investment in new assets takes place in country  $H$ . In stage 3, there is product market interaction and firms pay taxes on product market profits net incurred costs.

### 2.1. Stage 3: product market interaction and tax payments

We will work with the following notation: Let the set of firms in the industry be  $i \in \mathcal{I}$ , where  $\mathcal{I} = \{d, 1, 2, \dots, M\}$  and the set of (potential) ownerships of the domestic assets,  $\bar{k}$ , be  $l \in \mathcal{L}$ , where  $\mathcal{L} = \{d, 1, 2, \dots, M\}$ . The asset ownership structure  $\mathbf{K} = (k_d, k_{m_1}, \dots, k_{m_M})$  specifies the asset ownership of each firm. The first entry refers to firm  $d$ 's asset holdings, the second to foreign firm 1's assets holdings, etc.

In many countries, among these the United States and many European countries, income from equity-financed corporate investment is taxed twice: at the corporate level, a tax,  $t$ , is levied on net profits and, at the shareholder level, dividends and realized capital gains are subject to a personal capital gains tax,  $\tau$ . Our formalization of the tax system corresponds to such a double taxation system.<sup>16</sup> To capture the effects of taxes on the FDI pattern in a simple way, we work with the following taxation set up: A domestic owner keeping its assets  $\bar{k}$  pays a profit tax,  $t_h$ , on the net profits and a capital gains tax,  $\tau_h$ , on the capital gains, i.e. net profits net of profit taxes. Note that to simplify

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<sup>16</sup> See Sørensen (1995). For a discussion of the Swedish system, see Lodin et al. (2001).

the analysis, we assume that the initial value of the domestic firm is zero and there is no initial cost of setting up the firm. Thus, the change in value of the firm is the net profit, net profit taxes. If selling the assets  $\bar{k}$ , the domestic owner pays a capital gains tax,  $\tau_h$ , on the sales price,  $S$ . A foreign owner of  $\bar{k}$  and foreign firms entering greenfield pay the profit tax,  $t_r$ . If transfer pricing is possible, the profit tax is  $\min\{t_h, t_f\}$ . A foreign owner is then assumed to be able to shift profits to a location with a lower profit tax without any cost.<sup>17</sup> If transfer pricing is not possible, the foreign firm pays the profit tax  $t_h$  in the host country. A foreign owner always pays a capital gains tax,  $\tau_f$ , in a foreign country on the remaining proceeds.<sup>18</sup>

Let  $\pi_i(x, \kappa, l)$  denote the pre-tax product market profit of firm  $i$  net investment costs for new assets,  $\kappa_i$ .  $x$  is the vector of actions taken by firms in product market interaction,  $\kappa$  is the vector of investments in new assets from stage 2, and  $l$  denotes ownership of the domestic assets from stage 1. The optimal behavior in the product market interaction is given as follows. Given the investments in stage 2,  $\kappa$ , and the ownership of the domestic assets given from stage 1,  $l$ , firm  $i$  chooses an action  $x_i$  (a price or a quantity) to maximize its net product market profit net of taxes and deductions for inputs and investment costs, denoted  $(1 - \tau_r)(1 - t_r)\pi_i(x_i, x_{-i} : \kappa, l)$  for  $r = h, f$ , where  $x_{-i}$  is the set of actions taken by  $i$ 's rivals. We assume there to exist a unique Nash-Equilibrium,  $x^*(\kappa, l)$ , defined as:

$$(1 - \tau_r)(1 - t_r)\pi_i(x_i^*, x_{-i}^* : \kappa, l) \geq (1 - \tau_r)(1 - t_r)\pi_i(x_i, x_{-i}^* : \kappa, l), \quad \forall x_i \in R^+. \quad (2.1)$$

Since neither capital gains taxes  $\tau_r$  nor profit taxes  $t_r$  affect the firms' optimal actions  $x^*$  in (2.1), we can define a reduced-form product market profit for a firm  $i$ , taking as given the ownership  $l$  of the domestic assets  $\bar{k}$  and the vector of new investments  $\kappa$ , as  $\pi_i(\kappa, l) \equiv \pi_i(x_i^*(\kappa, l), x_{-i}^*(\kappa, l), \kappa, l)$ . The reduced-form product market profit net taxes is then simply  $(1 - \tau_r)(1 - t_r)\pi_i(\kappa, l)$ .

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<sup>17</sup> Costly transfer pricing will not qualitatively change the results. For an analysis where transfer pricing is endogenous within a setting where MNEs compete in an oligopoly see, for instance, Nielsen et al. (2005).

<sup>18</sup> Note that profit taxes are assumed to be paid only where profits are reported. See Davies (2004) for an elaborate analysis on bilateral tax treaties.

## 2.2. Stage 2: Investment in new assets

At this stage, firm  $i$  invests in new assets  $\kappa_i$ , such as capacity or R&D, given the ownership  $l$  of the domestic assets,  $\bar{k}$ , determined by the acquisition game in stage one. These investments are undertaken to maximize the reduced-form product market profits net of taxes and are assumed to be tax deductible. We assume there to exist a unique Nash-Equilibrium,  $\kappa^*(l)$ , defined as:

$$(1 - \tau_r)(1 - t_r) \pi_i(\kappa_i^*, \kappa_{-i}^* : l) \geq (1 - \tau_r)(1 - t_r) \pi_i(\kappa_i, \kappa_{-i}^* : l), \quad \forall \kappa_i \in R^+. \quad (2.2)$$

Once more, since capital gains and profit taxes do not affect the firm's optimal actions  $\kappa^*$  defined in (2.1), this allows us to define  $\pi_i(l) \equiv \pi_i(\kappa^*(l), l) \equiv \pi_i(x^*(\kappa^*(l)), \kappa^*(l), l)$  as a reduced-form gross profit function for firm  $i$  under ownership  $l$ , encompassing the firm's optimal actions in period three,  $x^*$ , and optimal investments in new assets in period two,  $\kappa^*$ . The reduced-form product market profit net taxes is hence  $(1 - \tau_r)(1 - t_h) \pi_i(l)$ .

The assumption that the foreign firms are symmetric before the acquisition takes place implies that we need only distinguish between *domestic* ownership ( $l = d$ ) and *foreign* (*foreign firm*) ownership ( $l = m$ ).

**Definition 1.** Let  $\gamma(m) = \gamma > 0$  be a measure of the complementarity between domestic assets  $\bar{k}$  and foreign firms' firm-specific assets.

Definition 1 implies that the "effective size" of the domestic assets  $\bar{k}$  under foreign ownership is  $\gamma \bar{k}$  (i.e.  $\gamma(m) = \gamma > 0$  and  $\gamma(d) \equiv 1$ ). Since foreign firms are typically leading firms in their respective industries and possess firm-specific knowledge in terms of technology or know-how of organization of production and marketing (see Markusen (1995) and Caves (1995)), foreign ownership can result in a more efficient use of the local asset,  $\bar{k}$ . This corresponds to a  $\gamma$  larger than one in the model. We then make use of the following definition:

**Definition 2.** An acquisition is technologically efficient if the buying foreign owner employs the local assets with a more efficient production technology, i.e.  $\gamma > 1$ . An acquisition is technologically inefficient if  $\gamma < 1$ .

To proceed, we need to keep track of two different types of asset ownership structures. When the domestic asset  $\bar{k}$  is sold to an acquiring foreign firm ( $A$ ), we have  $K(m) = (0, \gamma\bar{k} + \kappa_A^*, \kappa_G^*, \dots, \kappa_G^*)$ . The acquiring foreign firm  $A$  holds assets  $\gamma\bar{k} + \kappa_A^*$ , while the remaining  $M - 1$  greenfield entrants ( $G$ ) hold  $\kappa_G^*$ . If  $\bar{k}$  is not sold and all foreign firms enter greenfield, we have  $K(d) = (\bar{k} + \kappa_d^*, \kappa_G^*, \dots, \kappa_G^*)$ , where the domestic firm ( $d$ ) holds assets  $\bar{k} + \kappa_d^*$  and the  $M$  foreign firms hold assets  $\kappa_G^*$ .

A change in ownership of the existing domestic assets  $\bar{k}$  from domestic to foreign ownership is then assumed to affect the (gross) reduced-form profit for firms of different types as follows:

**Assumption 1:**  $\frac{d\pi_A(m)}{d\gamma} > 0$ ,  $\frac{d\pi_G(m)}{d\gamma} < 0$ ,  $\frac{d\pi_h(d)}{d\gamma} \equiv 0$ ,  $h = \{d, G\}$ .

Assumption 1 states that an increase in the complementarity parameter,  $\gamma$ , increases the acquirer's profit, whereas the profit for a non-acquirer decreases. This assumption is compatible with several different investment and oligopoly models. One example is the Linear Quadratic Cournot (LQC) Model presented in the on-line Appendix, where an increase in complementarity has a direct effect on (the acquiring firm's) productivity, indirectly affecting firms' optimal actions in the stage-three product market game ( $x^*$ ), or affecting these actions through firms' investment in new assets in stage two ( $\kappa^*$ ). Finally, for expositional reasons, we restrict the size of the complementarities to  $\gamma \in [0, \gamma^{\max})$ , where  $\gamma^{\max}$  is defined from  $\pi_G(m)|_{\gamma=\gamma^{\max}} = 0$ .

It can be shown that the main results of the paper would also hold if we assumed that some of the greenfield entrants were not able to enter greenfield. Basically, this implies that firms will maximize the expected profits and that some nonlinearities will appear due to the number of firms in the market now being endogenous. See Norbäck and Persson (2007) for a set-up where greenfield entry is uncertain, but taxes are not present.

### 2.3. Stage 1: The acquisition game

The acquisition process is depicted as an auction where foreign firms simultaneously post bids and the domestic firm then either accepts or rejects these bids. Each foreign firm announces a bid,  $b_i$ . Following the announcement of bids, the domestic firm is either sold at the bid price or remains in the ownership of firm  $d$ . The acquisition is solved for Nash equilibria in undominated pure strategies.

## 3. Ownership efficiency

Here, we examine the effects of how reductions in foreign taxes affect the likelihood of inefficient foreign acquisitions, i.e. acquisitions where  $\gamma \in (0, 1)$  and the likelihood of efficient foreign acquisitions, i.e. acquisitions where  $\gamma \in (1, \gamma^{\max})$ . We will show that whether reductions in foreign taxes induce inefficient/efficient foreign acquisitions depends on the level of complementarity between foreign and domestic assets, how the deductibility of "goodwill" – i.e. the part of the acquisition price above the value of deductible assets in the acquired firm – associated with an acquisition is treated and whether transfer pricing is an option. The treatment of goodwill in international M&As is complex and differs between countries (e.g. Dunne and Ndubzi, 1995). In the following, we consider the two polar cases of full or zero deductibility. Real world situations are likely to be less extreme and approximate partial deductibility, however.

### 3.1. Goodwill not deductible and transfer pricing not an option

We start with the case when goodwill associated with the acquisition is not deductible and foreign firms cannot make use of transfer pricing to avoid paying profit taxes in the host country. To solve the acquisition game, it will be useful to define  $\Delta_d(S)$  as the net gain for firm  $d$  of selling its assets  $\bar{k}$  at a selling price  $S$ :

$$\Delta_d(S) = \underbrace{(1 - \tau_h) S}_{\text{Net profit from sale}} - \underbrace{(1 - \tau_h)(1 - t_h) \pi_d(d)}_{\text{Net profit from no sale}}. \quad (3.1)$$

From (3.1), let the reservation price of firm  $d$  be  $v_d = \min S$ , *s.t.*  $\Delta_d(S) \geq 0$ . That is,  $v_d$  is the minimum price  $S$  at which  $d$  is willing to sell. Solving for  $\Delta_d(S) = 0$ , we have:

$$v_d = (1 - t_h) \pi_d(d). \quad (3.2)$$

Note that the capital gains tax  $\tau_h$  in the host country does not affect firm  $d$ 's reservation price  $v_d$ , since from (3.1), the capital gains tax is levied on both alternatives of selling and keeping the assets  $\bar{k}$ .

Deriving the foreign firms' valuations is slightly more involved. Let  $\Delta_{ml}(S)$  for  $l = d, m$  be the *net gain* for a foreign firm of acquiring the domestic firm's assets at a certain price  $S$ :

$$\Delta_{ml}(S) = \underbrace{(1 - \tau_f)(1 - t_h) \pi_A(m) - S}_{\text{Net profit from acquisition}} - \underbrace{(1 - \tau_f)(1 - t_h) \pi_G(l)}_{\text{Net profit from not acquiring}}. \quad (3.3)$$

Note that when *not* acquiring the domestic assets,  $\bar{k}$ , these would either remain in the hands of the domestic firm ( $l = d$ ) or be acquired by a rival foreign firm ( $l = m$ ) in which case the foreign firm enters greenfield. From (3.3), we can define a foreign firm's valuation as  $v_{ml} \equiv \max S$ , *s.t.*  $\Delta_{ml}(S) \geq 0$ . Solving for  $\Delta_{ml}(S) = 0$ ,  $v_{ml} = (1 - \tau_f)(1 - t_h) [\pi_A(m) - \pi_G(l)]$  is the maximum price  $S$  at which the foreign firm is willing to buy the domestic assets. Foreign firms thus have two valuations: The first is a *takeover valuation* which is a foreign firm's value of acquiring the domestic assets when these would otherwise remain in the hands of the domestic firm:

$$v_{md} = (1 - \tau_f)(1 - t_h) [\pi_A(m) - \pi_G(d)]. \quad (3.4)$$

The second is a *preemptive valuation*, which is the foreign firm's value of acquiring the domestic assets when a rival foreign firm would otherwise obtain them:

$$v_{mm} = (1 - \tau_f)(1 - t_h) [\pi_A(m) - \pi_G(m)]. \quad (3.5)$$

Comparing (3.4) and (3.5), note that the net profit for  $i$  of not obtaining assets  $\bar{k}$  is different, due to the change of identity of the firm which would otherwise obtain the assets.

We can then use these net gains and valuations to derive the equilibrium bidding behavior and the equilibrium ownership structures. To simplify the presentation, we make use of the following assumption:

**Assumption 2:** (i) There exists a  $\gamma^T > 0$  defined from  $v_{md}(\gamma^T, \cdot) = v_d$  and (ii) a  $\gamma^P > 0$  defined from  $v_{mm}(\gamma^*, \cdot) = v_d$ . Then, (iii)  $\gamma^{\max} > \gamma^P > \gamma^T > 0$  holds.

Assumption 2 ensures that all types of equilibrium ownership structures arise when varying the complementarity,  $\gamma$ . We can then state the following Proposition:<sup>19</sup>

**Proposition 1.** *Given that the complementarities between foreign firms' firm-specific assets and the domestic assets are: (i) sufficiently low,  $\gamma \in (0, \gamma^T)$ , no acquisition will take place and the EOS is  $\mathbf{K}(d)$ , (ii) of intermediate size,  $\gamma \in [\gamma^T, \gamma^P)$ , a foreign takeover acquisition will take place with  $S^* = v_d = (1 - t_h)\pi_d(d)$  and the EOS is  $\mathbf{K}(m)$ , and (iii) sufficiently high,  $\gamma \in [\gamma^P, \gamma^{\max})$ , a foreign preemptive acquisition will take place with  $S^* = v_{mm} = (1 - \tau_f)(1 - t_h)[\pi_A(m) - \pi_G(m)]$  and the EOS is  $\mathbf{K}(m)$ .*

Proposition 1 is illustrated in Figure 3.1. In Figures 3.1 (i) and 3.1 (ii), we derive the equilibrium ownership structure (EOS) by varying the size of the complementarities  $\gamma$  for given taxes. In Figure 3.1 (iii), we explore how the EOS changes when there is a variation in the foreign capital gains tax,  $\tau_f$ .

Start with Figure 3.1(i). When complementarities are low  $\gamma \in (0, \gamma^T)$ , a foreign firm's takeover valuation is lower than the reservation price of the domestic firm. This is illustrated in Figure 3.1 (i) where the  $v_d$  curve is above the  $v_{md}$  curve. In this case, the combined profit of the acquiring foreign firm and the domestic target firm is lower than their stand-alone profits. Thus, without any sufficient efficiency gains for the acquirer, the associated increase in concentration is not sufficient to make an acquisition profitable.

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<sup>19</sup> Assumption 2 ensures that foreign acquisitions at the reservation price  $v_d$  emerge in equilibrium, but otherwise have no qualitative effect on the results. For a full proof relaxing Assumption 2, we refer to the on-line Appendix linked to this article at the CJE journal archive,

<http://economics.ca/cje/en/archive.php>.

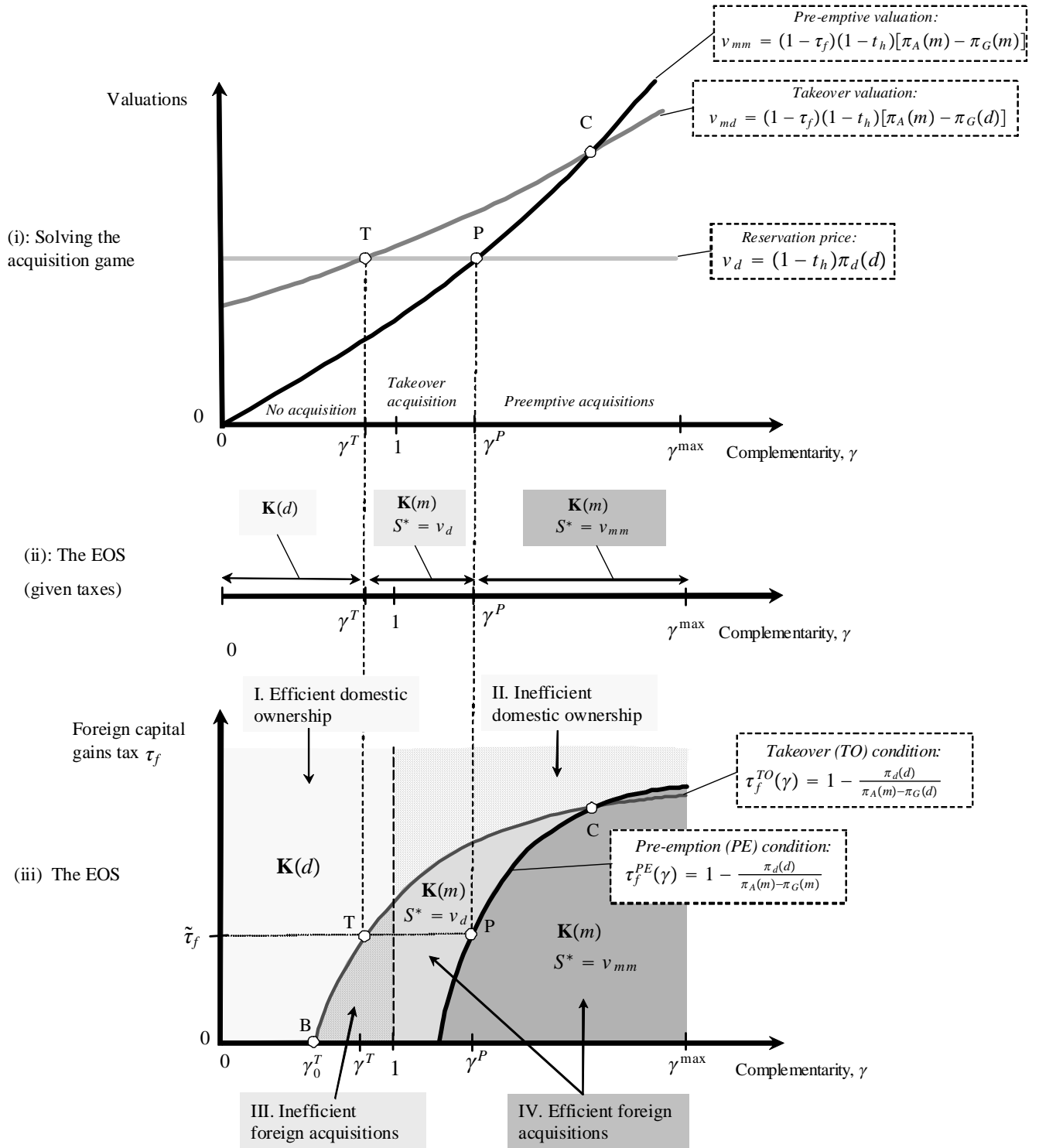


Figure 3.1: Solving for the Equilibrium Ownership Structure (EOS).

A foreign acquisition will occur for sufficiently large complementarities between foreign firms' assets and domestic assets. From Assumption 1, the takeover valuation,  $v_{md} = (1 - \tau_f)(1 - t_h)[\pi_A(m) - \pi_G(d)]$ , increases in the complementarity  $\gamma$ , since the expected profit as an acquirer  $\pi_A(m)$  increases in  $\gamma$ , whereas the domestic firm's valuation,  $v_d$ , and the foreign firm's profit as a non-acquirer  $\pi_G(d)$  are independent of  $\gamma$ . Assumption 2 states that at  $\gamma = \gamma^T$ ,  $v_{md} = v_d$  holds. It thus follows that a further increase in complementarities  $\gamma$  will make a takeover acquisition strictly profitable as  $v_{md} > v_d$  and the equilibrium sales price is then  $S^* = v_d = (1 - t_h)\pi_d(d)$ . This is illustrated at point T in Figure 3.1 (i).<sup>20</sup> Note that other foreign firms will not preempt a rival acquisition in this region, since a rival firm is better off as a non-acquirer, due to the benefit from a more concentrated market, as shown by  $v_d > v_{mm}$ .<sup>21</sup>

Note also that the increase in concentration associated with the acquisition can be sufficient to make an acquisition profitable also when the acquirer is less efficient. Intuitively, consumer prices will be higher when an acquisition takes place due to the fact that fewer firms compete in the market and this increase in revenue for the acquired firm might be higher than the increased cost due to an inefficient use of the assets. Consequently, inefficient acquisitions driven by market power may occur in equilibrium, where  $\gamma^T < 1$ .

Finally, turn to the case with high levels of complementarity between foreign firms' assets and domestic assets  $\gamma \in [\gamma^P, \gamma^{\max})$ . Using Assumption 1, we can note that a foreign firm's preemptive valuation  $v_{mm}$  will increase more than the takeover valuation  $v_{md}$ , **since** increasing complementarities do not only increase the product market profit as an acquirer but also decrease the product market profit as a non-acquirer:

$$\begin{aligned} \frac{dv_{mm}}{d\gamma} &= (1 - \tau_f)(1 - t_h) \left[ \frac{d\pi_A(m)}{d\gamma} - \frac{d\pi_G(m)}{d\gamma} \right] \\ &> (1 - \tau_f)(1 - t_h) \frac{d\pi_A(m)}{d\gamma} = \frac{dv_{md}}{d\gamma}. \end{aligned} \quad (3.6)$$

<sup>20</sup>From (3.1) and (3.3), it follows that  $\Delta_d(v_d) = 0$  and  $\Delta_{md}(v_d) > 0$  for  $\gamma \in [\gamma^T, \gamma^P)$ .

<sup>21</sup>From (3.3), it follows that  $\Delta_{mm}(v_d) < 0$  for  $\gamma \in [\gamma^T, \gamma^P)$ .

Thus, the preemptive valuation  $v_{mm}$  is not only driven by the benefits of obtaining a strong position in the product market as an acquirer, but also by the preemptive motive for avoiding a weak position as a non-acquirer. Assumption 2 states that at  $\gamma = \gamma^P$ ,  $v_{mm} = v_d$ . From (3.6), it then follows that a further increase in complementarities into the region  $\gamma \in (\gamma^P, \gamma^{\max})$  will make a preemptive acquisition strictly profitable as  $v_{mm} > v_d$ . Fierce bidding competition among foreign firms then drives the equilibrium sales price to  $S^* = v_{mm} = (1 - \tau_f)(1 - t_h)[\pi_A(m) - \pi_G(m)]$ . This is illustrated by point P in Figure 3.1 (i)<sup>22</sup>, which completes the proof of Proposition 1.

Let us now explore how changes in foreign profit taxation and capital gains taxes influence the equilibrium ownership structure. Note from Figure 3.1 (i) that a takeover acquisition is just profitable at point T, where  $v_{md} = v_d$  holds. From (3.2) and (3.4), we can then solve for the level of foreign capital gains tax  $\tau_f$  at which a takeover acquisition is just profitable:

$$\tau_f^{TO}(\gamma) = 1 - \frac{\pi_d(d)}{[\pi_A(m) - \pi_G(d)]}. \quad (3.7)$$

We label this condition the *takeover condition* (TO-condition),  $\tau_f^{TO}(\gamma)$ .

In the same vein, we can define the *preemption condition* (PE-condition)  $\tau_f^P(\gamma)$  as the level of foreign capital gains tax at which a preemptive acquisition is just profitable:

$$\tau_f^{PE}(\gamma) = 1 - \frac{\pi_d(d)}{[\pi_A(m) - \pi_G(m)]}. \quad (3.8)$$

The takeover condition  $\tau_f^{TO}(\gamma)$  and the preemption condition  $\tau_f^{PE}(\gamma)$  are illustrated in Figure 3.1(iii). Note that points T and P indicate where takeover acquisitions and preemptive acquisitions occur for a given level of foreign capital gains taxation  $\tilde{\tau}_f$ , derived from Figure 3.1(i). The locus associated with the takeover condition  $\tau_f^{TO}(\gamma)$  and the preemption condition  $\tau_f^{PE}(\gamma)$  is then upward-sloping in the  $\gamma - \tau_f$  space. Intuitively, at higher complementarities  $\gamma$ , a higher foreign capital gains taxation  $\tau_f$  is needed to balance the foreign firm's higher value of obtaining the domestic assets (i.e. to preserve  $v_{ml} = v_d$  for  $l = d, m$ ). The locus of the takeover condition  $\tau_f^{TO}(\gamma)$  is above the locus of the preemption condition

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<sup>22</sup> From (3.3), it follows that  $\Delta_{mm}(v_d) > 0$  for  $\gamma \in [\gamma^P, \gamma^{\max})$ . At  $S^* = v_{mm}$ ,  $\Delta_{mm}(v_{mm}) = 0$ .

$\tau_f^{PO}(\gamma)$  if and only if the complementarities are not too large.<sup>23</sup> The equilibrium ownership structure involves domestic ownership north-east of the takeover locus  $\tau_f^{TO}(\gamma)$ , indicated as  $K(d)$ . Preemptive acquisitions occur southwest of the preemption locus  $\tau_f^{PO}(\gamma)$ , as is indicated by  $K(m)$  and  $S^* = v_{mm}$ . Finally, takeover acquisitions occur for combinations of  $\gamma$  and  $\tau_f$  between the takeover locus  $\tau_f^{TO}(\gamma)$  and the preemption locus  $\tau_f^{PO}(\gamma)$ , indicated as  $K(m)$  and  $S^* = v_d$ .

Inspecting Figure 3.1(iii), we can make the following observations:

(i) There is no effect of taxes levied in the host country on the equilibrium ownership structure: The domestic capital gains tax  $\tau_h$  is neutral to the decision of whether to sell since, as noted from (3.1), the reward for selling/not selling is taxed symmetrically. Moreover, since the domestic profit tax  $t_h$  is paid by all firms, it has a symmetric effect on foreign firms' valuations and the domestic firm's reservation price and hence, does not affect the equilibrium ownership of the domestic assets,  $\bar{k}$ .

(ii) For a given level of the complementarity  $\gamma$ , a reduction of  $\tau_f$  can induce foreign acquisitions, since a lower tax for foreign shareholders increases foreign firms' valuations of the domestic assets from (3.4) and (3.5). At a low level of complementarities, reductions in taxes may even trigger *inefficient foreign acquisitions*, where  $\gamma < 1$ . This can be seen in a vertical movement from Region I to Region III in 3.1(iii). The driving force behind these inefficient acquisitions is the increase in concentration resulting from the acquisition, which becomes less costly to achieve at lower taxation.

(iii) If the complementarity between foreign and domestic assets is sufficiently high, a reduced foreign capital gains tax  $\tau_f$  can lead to efficient foreign acquisitions where  $\gamma > 1$ . Intuitively, with lower taxation, efficient foreign acquisitions also become less costly as the tax burden is reduced. Thus, lower foreign capital gains taxes can trigger efficient foreign acquisitions, which can be seen from a vertical movement from Region II to Region IV in 3.1(iii).

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<sup>23</sup> At point C in Figure 3.1 (i)  $v_{md} = v_{mm}$ . It then follows that  $\tau_f^{TO}(\gamma) = \tau_f^{PE}(\gamma)$  at point C in Figure 3.1 (iii).

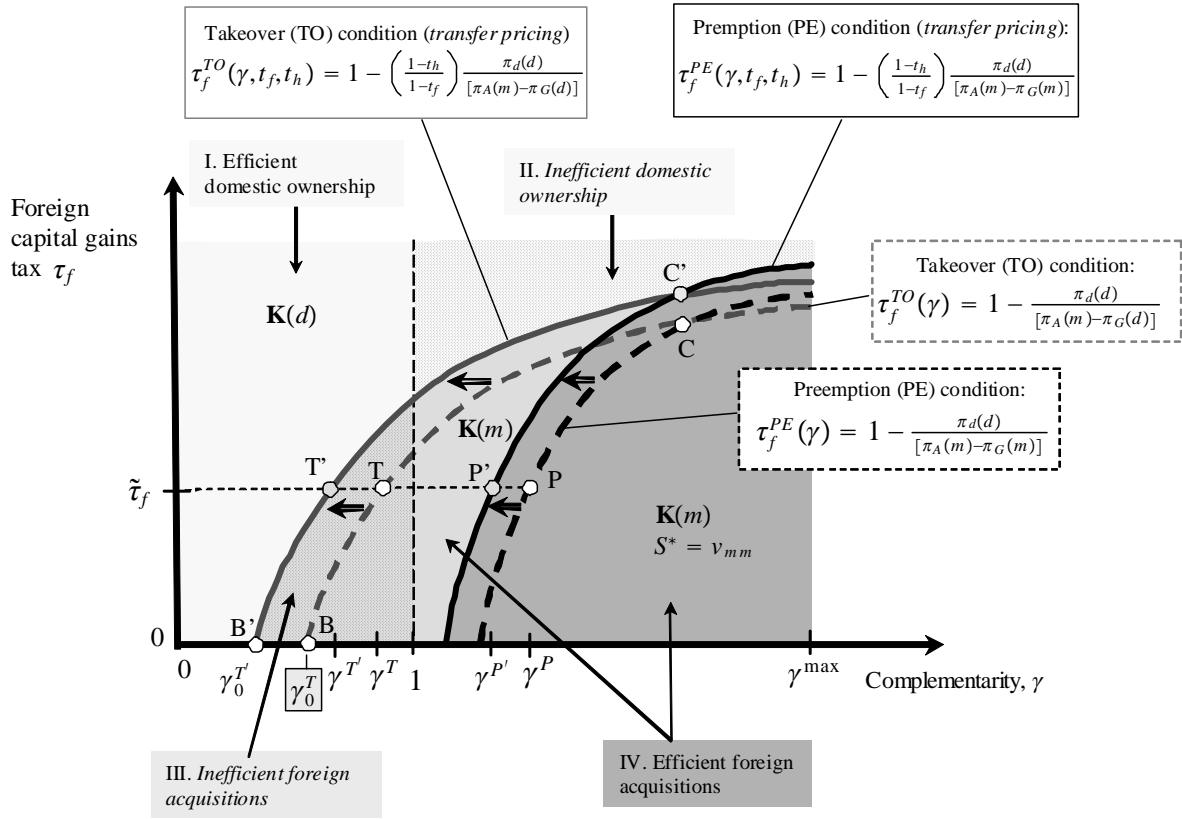


Figure 3.2: The Equilibrium ownership structure under transfer pricing.

Thus, we can state the following proposition:<sup>24</sup>

**Proposition 2.** *If goodwill is not deductible and transfer pricing is not possible, then a reduced foreign capital gains tax can trigger inefficient as well as efficient foreign acquisitions.*

### 3.2. Goodwill not deductible and transfer pricing is an option

It is well known that foreign firms can reduce their overall tax burden by shifting profits toward low-tax countries, for example by using transfer pricing techniques. Indeed, Bartelsman and Beetsma (2000) find evidence of tax differences having a significant impact

<sup>24</sup>The existence of these results can be shown using the Linear Quadratic Cournot Model available at the CJE journal archive <http://economics.ca/cje/en/archive.php>

on where incomes are declared.<sup>25</sup> To capture this, we assume that a foreign owner can use transfer pricing to transfer all profits to a foreign tax haven, where a foreign profit tax,  $t_f < t_h$ , is paid. As discussed in Section 2, such transfer pricing is assumed to be risk free and costless.

To see how the results change under transfer pricing, we need only substitute the foreign profit tax  $t_f$  for the home profit tax  $t_h$  into the expressions for foreign firms' valuations (3.4) and (3.5) and thus,  $v_{ml} = (1 - \tau_f)(1 - t_f)[\pi_A(m) - \pi_G(l)]$  for  $l = d, m$ . Since firm  $d$ 's reservation price remains unchanged at  $v_d = (1 - t_h)\pi_d(d)$ , the takeover condition (3.7) and the preemption condition (3.8) become:

$$\tau_f^{TO}(\gamma, t_f, t_h) = 1 - \left(\frac{1-t_h}{1-t_f}\right) \frac{\pi_d(d)}{[\pi_A(m)-\pi_G(d)]}, \quad \tau_f^{PE}(\gamma, t_f, t_h) = 1 - \left(\frac{1-t_h}{1-t_f}\right) \frac{\pi_d(d)}{[\pi_A(m)-\pi_G(m)]}. \quad (3.9)$$

Comparing (3.9) with (3.7) and (3.8), it follows that both the takeover locus and the preemption locus will shift to the left in Figure 3.1, due to transfer pricing since  $t_f < t_h$  implies that  $\frac{(1-t_h)}{(1-t_f)} < 1$ . This is illustrated in Figure 3.2. Note that points T' and P' indicate that takeover acquisitions and preemptive acquisitions occur at lower complementarities under transfer pricing, since  $\gamma^{T'} < \gamma^T$  and  $\gamma^{P'} < \gamma^P$ . Intuitively, as tax evasion occurs through the transfers of profits to a tax haven, the complementarities must be smaller to balance the foreign firms' higher value of obtaining the domestic assets (i.e. to preserve  $v_{ml} = v_d$  for  $l = d, m$ ). As can be seen in Figure 3.2, this increases Region III where inefficient foreign acquisitions occur, while reducing Region II where inefficient domestic ownership prevails.

We have the following proposition:

**Proposition 3.** *If goodwill is not deductible and transfer pricing is possible, then a reduced foreign capital gains tax and a reduced foreign profit tax can trigger inefficient as well as efficient foreign acquisitions.*

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<sup>25</sup> See also references in World Investment Report (WIR) 1998.

### 3.3. Goodwill deductible

The deductibility of "goodwill" associated with an acquisition, i.e. the part of the acquisition price above the value of the deductible assets in the acquired firm, varies between countries and is open to different plausible interpretations. The previous section took the assumption of not allowing goodwill to be deductible. How will the results change if this assumption is relaxed? To explore this, first assume that transfer pricing is not possible and hence, foreign firms pay domestic profits taxes  $t_h$ . Assume that goodwill can be deducted when capital gains taxes are to be paid, but not when profit taxes are to be paid. To derive foreign firm valuations, a foreign firm's net gain from buying firm  $d$ 's assets is:

$$\Delta_{ml}(S) = \underbrace{(1 - \tau_f) [(1 - t_h) \pi_A(m) - S]}_{\text{Net profit from acquisition}} - \underbrace{(1 - \tau_f) (1 - t_h) \pi_G(l)}_{\text{Net profit from greenfield entry}}, \quad (3.10)$$

where  $l = d, m$  indicating the alternative ownership of assets  $\bar{k}$  when a foreign firm does not obtain these assets and enters greenfield. Once more, define the foreign firm's valuation as  $v_{ml} \equiv \max S, s.t \Delta_{ml}(S) \geq 0$ . Solving for  $\Delta_{ml}(S) = 0$ , foreign firms' valuations  $v_{ml}$  are thus  $v_{md} = (1 - t_h) [\pi_A(m) - \pi_G(d)]$ , which is the value of an acquisition given that firm  $d$  will not sell otherwise, and  $v_{mm} = (1 - t_h) [\pi_A(m) - \pi_G(m)]$ , which is the value of an acquisition, given that a rival foreign firm will otherwise obtain firm  $d$ 's assets. Note that since firm  $d$ 's reservation price does not change and thus remains at  $v_d = (1 - t_h) \pi_d(d)$ , it follows that taxes are completely neutral in this case.

Thus, we can state the following proposition:

**Proposition 4.** *If goodwill is deductible and transfer pricing is not an option, foreign taxes will not affect the pattern of foreign acquisitions.*

Under transfer pricing, foreign firms' valuations become  $v_{ml} = (1 - t_f) [\pi_A(m) - \pi_G(l)]$  for  $l = d, m$ , while the domestic owner's reservation price is  $v_d = (1 - t_h) \pi_d(d)$ . Using the same method as above, we can state the following proposition:

**Proposition 5.** *If goodwill is deductible and transfer pricing is possible, then a reduced foreign profit tax can trigger inefficient as well as efficient foreign acquisitions.*

Note also that if the foreign firm uses retained earnings as payment in the acquisition and that these retained earnings will be taxed as foreign capital gains, the net gain will be written as in 3.10, also when goodwill is not deductible. The reason is that the foreign owner's gains are then "locked in" and it will pay foreign capital gains taxes irrespective of whether acquiring the domestic firm.

### 3.4. When do reductions in foreign taxes risk triggering inefficient foreign acquisitions?

To better understand when foreign tax reduction risks triggering inefficient foreign acquisitions, it is instructive to make a comparison with a benchmark without taxes. This will show that when foreign owners gain tax advantages, lower foreign profit taxes are more likely to induce inefficient foreign acquisitions than if such advantages stem from lower foreign capital gains taxes. For illustrational purposes, it is assumed throughout this section that goodwill is not deductible.

To introduce a benchmark without taxation, we proceed as follows. From the takeover condition  $\tau_f^{TO}(\gamma)$  in (3.7), let  $\gamma_0^T$  denote the lowest the level of synergies associated with a profitable acquisition in a situation without taxation. In Figure 3.1(iii),  $\gamma_0^T$  is marked out in point B and  $\tau_f = 0$ , where  $\gamma_0^T < 1$  illustrates that inefficient acquisition can also arise without taxation due to the concentration (market power) effect.<sup>26</sup>

Let us now introduce capital gains taxes. From (3.2), we know that domestic capital gains taxes  $\tau_h$  are neutral to the domestic owner's decision to sell the domestic assets  $\bar{k}$ , whereas from (3.4), foreign capital gains taxes  $\tau_f$  will reduce a foreign owner's willingness to pay  $v_{md}$ . As illustrated by the upward slope of the takeover condition-locus  $\tau_f^{TO}(\gamma)$  in Figure 3.1(iii), this implies that larger synergies are required to make foreign acquisition profitable. As illustrated in this figure, if foreign capital gains taxes are initially sufficiently high, a moderate reduction in foreign capital gains will then trigger efficient

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<sup>26</sup> Since domestic host country taxes do not affect the Equilibrium Ownership Structure (EOS), point B in Figure 3.1(iii) represents the EOS without taxes.

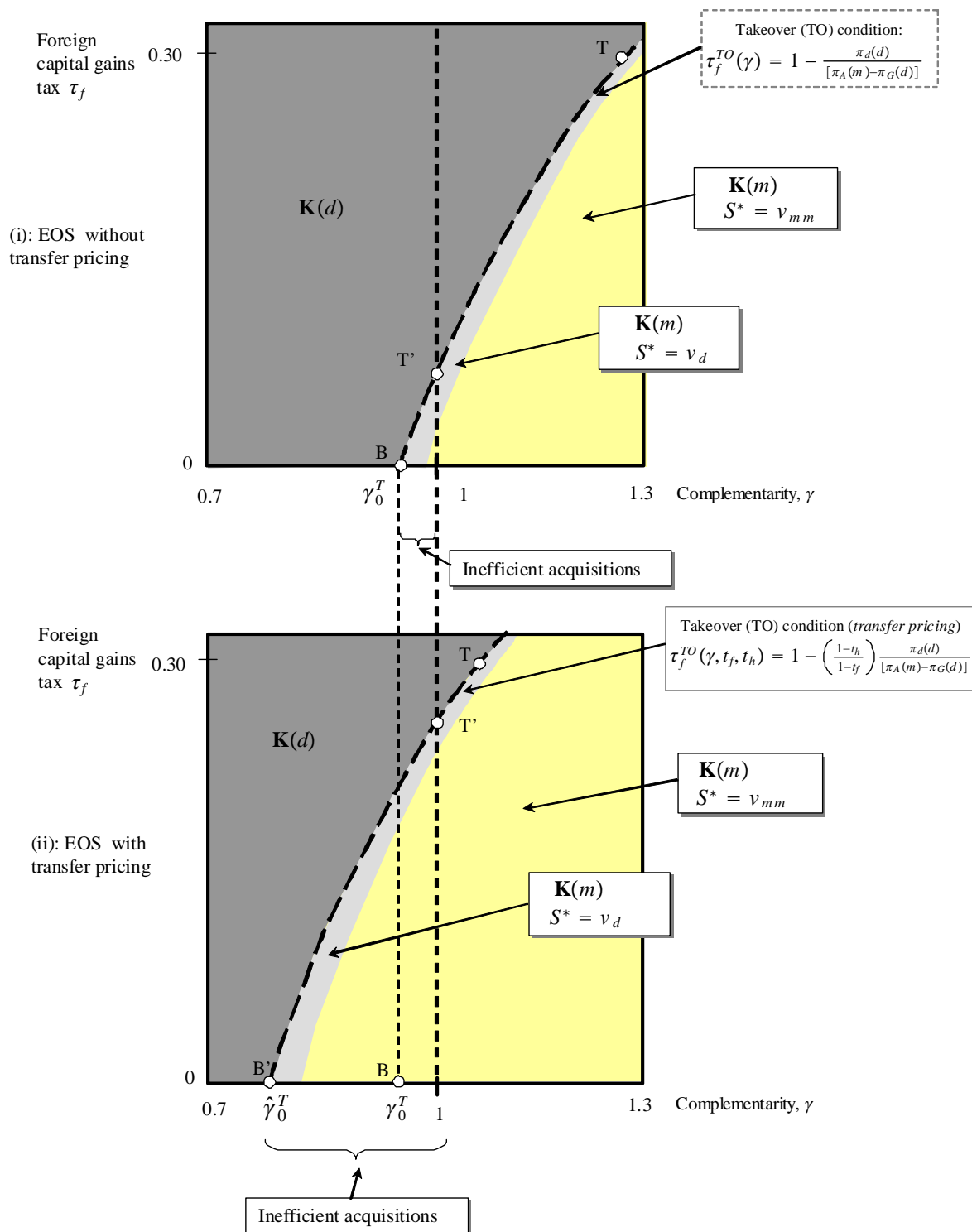


Figure 3.3: The EOS in the LQC model. Parameter values at:  $M = 4$ ,  $s = \Lambda = 5$ ,  $\eta = 0.3$  and  $\bar{k} = 1$ . In Panel (ii),  $t_h = 0.3 > 0 = t_f$ . For details of the LQC model, see the CJE journal archive <http://economics.ca/cje/en/archive.php>

foreign acquisitions since the cut-off synergy  $\gamma^T$  is substantially above unity when the foreign capital gains tax is reduced. A numeric example is shown in Figure 3.3(i) using the LQC-model. If the initial foreign capital gains tax is 30%, it can be reduced to roughly 8% with only efficient foreign acquisitions being triggered, as shown by points T and T' in the figure. Moreover, note that when taxes are absent, the synergy level required for a foreign acquisition to take place is about 0.96, i.e.  $\gamma_0^T = 0.96$ .

Consequently, we can state the following Proposition:

**Proposition 6.** *Suppose that transfer pricing is not possible and goodwill is not deductible. Then, if foreign capital gains taxes are initially not too low, a reduction in foreign capital gains taxes tends to trigger efficient foreign acquisitions.*

Intuitively, capital gains taxes work as a friction on foreign acquisitions, forcing substantial synergies to arise in order to generate a profitable cross-border acquisition. A limited reduction in the taxation of foreign shareholders is therefore likely to trigger efficient acquisition.

Let us now examine the effect of profit taxes and transfer pricing. From the takeover condition  $\tau_f^{TO}(\gamma, t_f, t_h)$  in (3.9), let  $\hat{\gamma}_0^T$  denote the lowest level of synergies associated with a profitable acquisition in a situation where the foreign firm can evade domestic profit taxes when foreign shareholders do not face any capital gains taxes,  $\tau_f = 0$ . As shown in Figure 3.2, inefficient acquisitions can now occur for even lower synergies under profit tax evasion than in the benchmark case without taxation. This shown by point B' being located to the left of B, where  $\hat{\gamma}_0^T < \gamma_0^T < 1$ . Once more, illustrating with the LQC-model, Figure 3.3(ii) shows that with a complete evasion of a domestic profit tax at 20%, the synergy level required for a foreign acquisition to take place is now reduced to about 0.78 when the foreign shareholders are not taxed. Consequently, as compared to the benchmark without taxation, even more inefficient foreign acquisitions are triggered by foreign profit tax evasion, i.e.  $\hat{\gamma}_0^T = 0.78 < \gamma_0^T = 0.96$ .

We can then state the following Proposition:

**Proposition 7.** *Suppose transfer pricing to be possible and that there are no capital gains taxes. Then, a reduction in foreign profit taxes will trigger inefficient foreign acquisitions.*

Low foreign profit taxes can thus increase the likelihood of inefficient foreign acquisitions, since a foreign owner is at an advantage. As long as the friction from capital gains taxes in blocking foreign acquisitions is not too large, tax evasion will trigger inefficient foreign acquisitions.

The impact of a change in a foreign tax will interact with other taxes faced by the agents. Efficiency gains from foreign ownership may be generated when tax reductions occur in home countries of MNEs with a relatively high or strict application of taxation, whereas efficiency gains may be absent when acquisitions are generated by even more favorable conditions for MNEs facing low taxes on profits and ownership. Using the LQC-model as an example, and comparing points T and T' in Figure 3.3(i) and 3.3(ii), we note that under tax evasion, a much smaller reduction in the foreign capital gains tax is associated with efficient foreign acquisitions.

## 4. Cross-Border Acquisitions and Domestic Tax Revenues

In the Section 1, we noted that capital gains tax revenues might potentially be substantially increased when a foreign acquisition occurs, as illustrated by the example of Ford's acquisition of Volvo in Figure 1.1. In this section, it is shown that a foreign acquisition can indeed increase the tax revenues when the complementarities between foreign and domestic assets are high and there is a fundamental difference between foreign direct investment in scarce and non-scarce assets as concerns the effects on tax revenues.

To this end, add a stage zero to the game where the government chooses among three types of policies towards FDI, considering the impact on tax revenues. Under a restrictive (R) policy, FDI is not allowed and the domestic monopoly remains intact. Denote the associated ownership structure  $K(d^{\text{mon}})^{27}$ . Under a discriminatory (D) policy, only

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<sup>27</sup>  $\mathbf{K}(d^{\text{mon}}) = (\bar{k} + \kappa_d^*, 0, \dots, 0)$ . In this case, the domestic firm retains its monopoly and holds

greenfield FDI is allowed. The associated ownership structure is then  $K(d)$ , where firm  $d$  keeps its assets and all foreign firms enter greenfield. Finally, under a liberal (L) policy, both greenfield and acquisition FDI are allowed and hence, in addition to the ownership structure  $K(d)$ , the ownership structure  $K(m)$  may arise, where the domestic owner sells its assets in stage 1 to one of the foreign firms and the remaining foreign firms enter greenfield. Note that while our discussion here assumes that government policy shapes the FDI pattern, we could also interpret these policies as situations where only certain types of entry modes are available. For instance, in some industries, no valuable targets might be present and greenfield entry might be the only possible way of entering. An alternative interpretation is thus that nature chooses the type of industry in stage zero.

To proceed, we assume that foreign firms cannot deduct goodwill while transfer pricing is possible, i.e. we base the analysis on the case studied in Section 3.2, which enables us to illustrate the main mechanisms in a convenient way. In particular, this enables us to abstract from tax payments by foreign greenfield entrants to focus on the direct effect of the foreign acquisition on domestic tax revenues. We discuss the effects on tax revenues of different treatments of goodwill deductions and transfer pricing at the end of the section.

Let us first compare the collected tax revenues when only greenfield takes place under the D-policy with the collected taxes when no FDI takes place under the R-policy. Tax revenues under the R-policy are simply those from taxing the monopoly twice. This tax revenue is  $T^R = [t_h + \tau_h(1 - t_h)] \pi_d(d^{\text{mon}})$ . Tax revenues under the D-policy are  $T^D = [t_h + \tau_h(1 - t_h)] \pi_d(d)$ , since  $\pi_d(d)$  is the domestic firm's profit under greenfield entry by foreign firms and since foreign firms fully evade taxes in the host country. The tax revenues  $T^R$  and  $T^D$  are illustrated as horizontal lines in Figure 4.1 (iii) since from definition 1, tax revenues  $T^R$  and  $T^D$  do not depend on  $\gamma$ . We then have:

$$T^D - T^R = [t_h(1 - t_h) + t_h] \underbrace{[\pi_d(d) - \pi_d(d^{\text{mon}})]}_{(-)} < 0, \quad (4.1)$$

where we make the assumption that the loss of monopoly power reduces firm  $d$ 's product  


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the assets  $\bar{k} + \kappa_d^*$ .

market profit,  $\pi_d(d) < \pi_d(d^{\text{mon}})$ .

Consequently, we have derived the following result:

**Lemma 1.** *If goodwill is not deductible, foreign firms can use transfer pricing and if foreign firms only enter greenfield, tax revenues will be lower than if the domestic monopoly had remained, i.e.  $T^R > T^D$ .*

Intuitively, when FDI only takes place through greenfield entry, tax revenues are reduced by FDI since the foreign entrants evade taxes and the domestic firm's taxable profit is reduced.

Let us now consider the L-policy where a foreign acquisition also takes place. In Figures 4.1 (i) and 4.1 (ii), we derive the equilibrium ownership structure (EOS) by varying the size of the complementarities,  $\gamma$ . Under transfer pricing, note that takeover acquisitions become profitable at  $T'$ , whereas preemptive acquisitions are profitable at  $P'$ . Hence, for low complementarities  $\gamma \in (0, \gamma^{T'})$ , no acquisition takes place and tax revenues are identical under the L- and D-policies. When  $\gamma \in [\gamma^{T'}, \gamma^{P'})$ , a takeover acquisition occurs and the acquisition price is  $S^* = v_d = (1 - t_h)\pi_d(d)$ . The corresponding tax revenues are thus  $T^L = \tau_h v_d = \tau_h(1 - t_h)\pi_d(d)$ . As illustrated in Figure 4.1 (iii), in this interval, the L-policy may not only induce inefficient acquisitions (for which  $\gamma < 1$ ), it also generates the lowest tax revenues since the foreign acquirer uses transfer pricing to avoid paying profit taxes in the host country, which is illustrated by the downward shift in the  $T^L$  curve in Figure 4.1 (iii) at  $\gamma^T$ .

However, at high complementarities  $\gamma \in [\gamma^{P'}, \gamma^{\text{max}})$ , a preemptive acquisition will occur and the acquisition price is driven up to  $S^* = v_{mm} = (1 - \tau_f)(1 - t_f)[\pi_A(m) - \pi_G(m)]$ . The corresponding tax revenues in this case are  $T^L = \tau_h v_{mm}$ . In contrast, in this interval, the tax revenues may be higher when allowing for foreign acquisition under the L-policy since the sales price and the corresponding capital gains tax revenues might then be so large as to compensate for the loss of double taxation of the domestic monopoly profit  $\pi_d(d^{\text{mon}})$ . This is illustrated by the upward slope of the  $T^L$  curve in Figure 4.1 (iii) at  $\gamma^{P'}$ .

and the  $T^L$  curve being above the  $T^R$  curve at  $\gamma > \hat{\gamma}^{LR}$ .

We have thus derived the following result:

**Proposition 8.** (i) When a takeover acquisition occurs for medium complementarities  $\gamma \in [\gamma^{T'}, \gamma^{P'}]$ , the L-policy allowing both acquisitions and greenfield FDI leads to the lowest tax revenues,  $T^R > T^D > T^L$ . (ii) When a preemptive acquisition occurs for sufficiently high complementarities  $\gamma > \hat{\gamma}^{LR} \geq \gamma^{P'}$ , the L-policy allowing both acquisition and greenfield FDI leads to the highest tax revenues,  $T^L > T^R > T^D$ .

The proposition illustrates that foreign acquisitions may indeed reduce the tax revenues when foreign firms evade taxes. However, given that the target's complementarities and efficiency gains are sufficiently large, the proposition also illustrates that allowing both types of entry might generate higher tax revenues than restricting foreign entry, despite the tax evasion by foreign firms. Due to fierce bidding competition between the foreign firms over highly complementary domestic assets, all benefits from the acquisition – including the evaded taxes – are then competed away and accrue to the domestic seller. Hence, by taxing the increased capital gains of the selling domestic owner, the lost profit taxes are compensated and if the increase in capital gains for the domestic seller is sufficiently large, the tax revenues will be higher when the acquisition takes place.

How would the results then change if goodwill is deductible and transfer pricing is not an option? More generally, when preemptive acquisitions occur for sufficiently high synergies, the bidding competition over strategically valuable assets will lead to increased taxable capital gains from the domestic seller. Indeed, this holds regardless of the tax system as long as the host country taxes domestic shareholders. In particular, maintaining the assumption of no goodwill deduction while relaxing the assumption of transfer pricing will strengthen the result that tax revenues can increase from allowing foreign acquisitions. This follows from the fact that a foreign acquisition will take place in this environment if and only if aggregate industry profit increases which, in turn, implies that aggregate

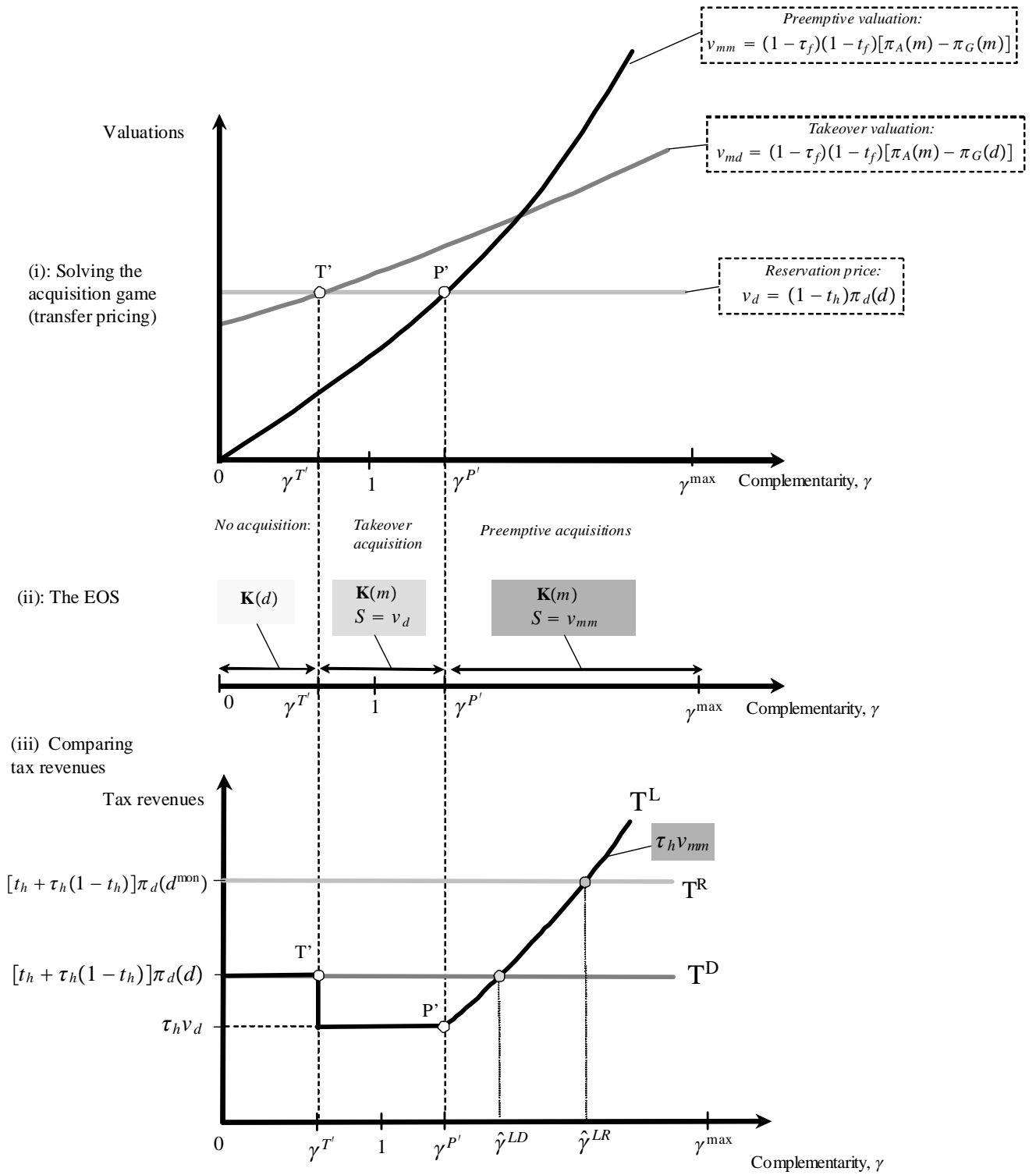


Figure 4.1: Tax revenues and government policy under transfer pricing.

taxable profits will increase under the L-policy.<sup>28</sup>

We should note that the possibility that taxing the increased capital gains of the selling domestic owner can compensate for evaded profit taxes is less likely to be fulfilled when the ownership of the target firm is to a large extent international. Since foreign owners will typically pay capital gains taxes in their respective home countries, if the foreign ownership in the domestic target firm is sufficiently large, Proposition 8 will not hold.

Let us also use our framework to briefly shed some light on the welfare effects of cross-border acquisitions. Starting with the effects on consumers, we note that when a takeover acquisition occurs for medium complementarities, such an acquisition may lead to a decreased consumer surplus due to inefficient production and market power effects. However, when the synergies increase, the assets of the domestic firm will be used more efficiently and the consumer surplus might increase. The domestic shareholders will not lose from an acquisition, since the foreign acquirer will pay the reservation price of the domestic seller. At high complementarities, a preemptive acquisition will occur and the domestic shareholders will now gain from selling, since the bidding competition will induce a foreign acquirer to pay more than the shareholders' reservation price.

**Asymmetric MNEs** Let us finally explore how the results change when allowing for firm asymmetries. To this end, we make the following assumption:

**Assumption 2:** (i)  $\frac{d\pi_{A_1}(m)}{d\gamma} > \dots > \frac{d\pi_{A_M}(m)}{d\gamma} > 0$ , (ii)  $\frac{d\pi_{G,A_1}(m)}{d\gamma} < \dots < \frac{d\pi_{G,A_M}(m)}{d\gamma} < 0$ ,  
 $\frac{d\pi_h(d)}{d\gamma} \equiv 0$ ,  $h = \{d, G\}$ .

Assumption A2 implies that MNE 1 generates the largest gain in profits from synergies, but also exerts the largest negative externality on the non-acquiring competitors. To simplify the presentation, we also assume that  $\pi_{A_i}(m)|_{\gamma=0} = \pi_{G,A_i}(m)|_{\gamma=0} = \bar{\pi}$ .<sup>29</sup> Note that Assumption 2 implies that MNE 1 will always have the highest valuation of the

<sup>28</sup>Proof of these statements based on the Linear Quadratic Model is available upon request.

<sup>29</sup>Assumption A2 can be incorporated into the LQC model by assuming the synergies to be  $\gamma_i = \alpha_i\gamma$ , where  $\alpha_1 = 1 > \alpha_2 > \dots > \alpha_M > 0$ .

domestic assets, which implies that if an acquisition occurs, MNE 1 will be the acquirer. This is shown in Figure 4.2, which depicts a case with two MNEs in the market,  $M = 2$ . In the case of transfer pricing and goodwill not being deductible, valuations become  $v_{mm}^1 = (1 - \tau_f)(1 - t_f)[\pi_{A_1}(m) - \pi_{G,A_2}(m)]$ ,  $v_{md}^1 = (1 - \tau_f)(1 - t_f)[\pi_{A_1}(m) - \pi_G(d)]$  for MNE 1, whereas for MNE 2 we have  $v_{mm}^2 = (1 - \tau_f)(1 - t_f)[\pi_{A_2}(m) - \pi_{G,A_1}(m)]$  and  $v_{md}^2 = (1 - \tau_f)(1 - t_f)[\pi_{A_2}(m) - \pi_G(d)]$ . As illustrated in Figure 4.2, the MNEs' valuations are increasing in synergies, with  $v_{mm}^1 \geq v_{mm}^2$  and  $v_{md}^1 \geq v_{md}^2$ . Once more, we note that takeover acquisitions will only occur for sufficiently high synergies.<sup>30</sup> Note that a preemptive acquisition now occurs when  $v_{mm}^2 > v_d$ . The main difference in the case with symmetric MNEs is then that the acquiring firm (MNE 1) will generate some rents even for high complementarities, since it pays the valuation of the MNE with the second highest valuation, i.e.  $S^* = v_{mm}^2 < v_{mm}^1$ .

If the asymmetries are due to some firms being less efficient than in the main model, the captured increase in the capital gains tax from the foreign acquisition will be smaller. This implies that the result that taxing the increased capital gains of the selling domestic owner can compensate for lost evaded profit taxes is less likely to be fulfilled.

## 5. Concluding remarks

Our model suggests that when transfer pricing is possible, differences in international profit taxes constitute an advantage for foreign owners and may therefore induce inefficient foreign acquisitions of domestic firms. We also show that if goodwill associated with foreign acquisitions is not fully deductible, reductions in capital gains taxes can trigger efficient foreign acquisitions, since foreign capital gains taxes then work as a friction on foreign acquisitions.

Further, it is well known that entry by foreign firms may lead to rent shifts from

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<sup>30</sup>For  $v_{md}^1 \geq v_{md}^2 > v_d > v_{mm}^2$ , there exist multiple equilibria, either MNE 1 or MNE 2 makes the acquisition and the sales price can be in the interval  $v_d$  to  $v_{md}^2$ .

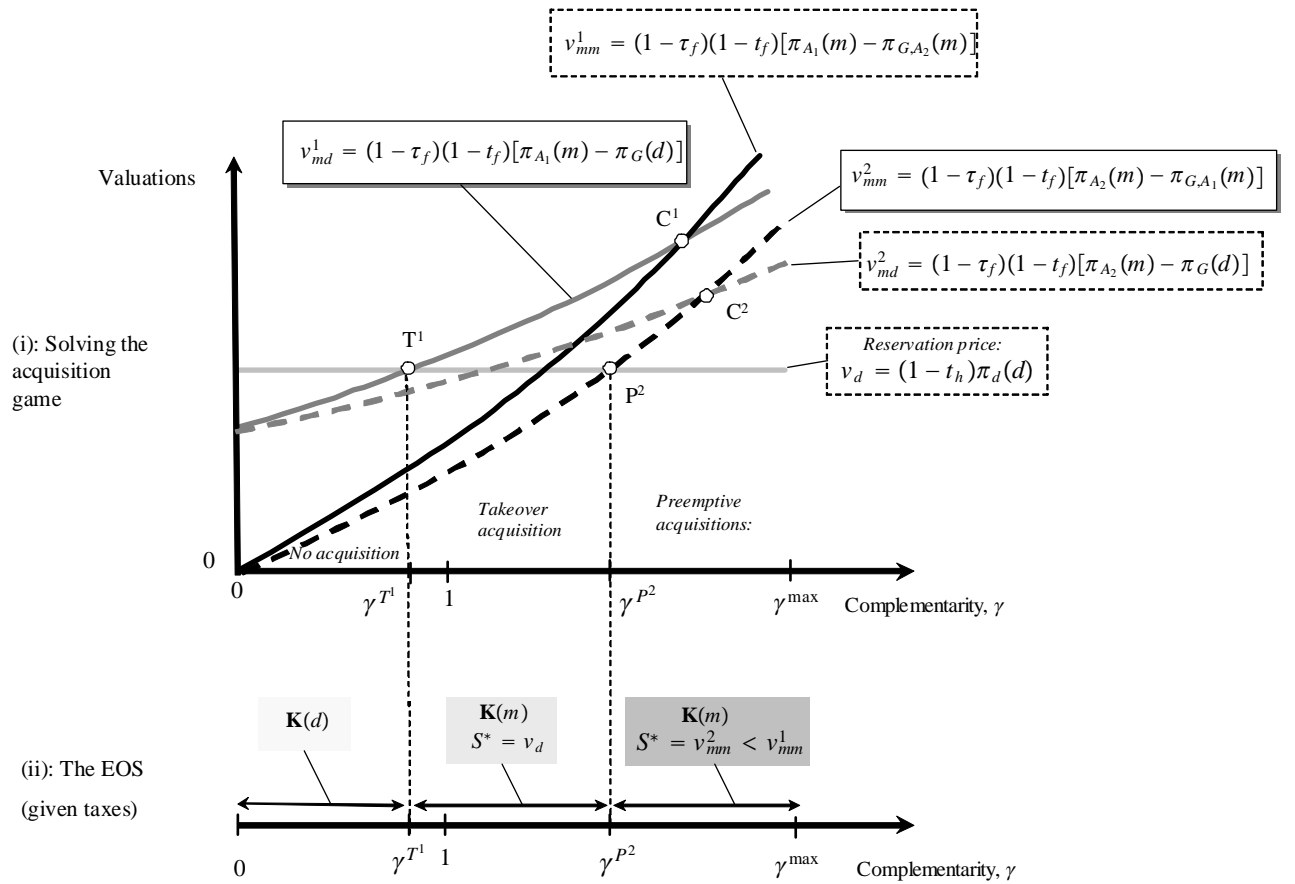


Figure 4.2: The EOS with asymmetric MNEs.

domestic to foreign owners which, in turn, may reduce the tax revenues for the domestic country. However, in this paper, it is shown that if foreign entry takes place through the acquisition of sufficiently scarce domestic assets, domestic tax revenues can increase. The reason is that in the bidding competition between foreign firms over the scarce domestic assets, the benefits from the acquisition, including tax advantages and evaded taxes, are competed away and captured by the domestic seller which, in turn, pays capital gains tax on the proceeds. Consequently, the paper suggests that one important measure for mitigating the effects of tax evasion by foreign firms is to ensure that there is competition between foreign firms to enter the domestic market. Otherwise, a dominating foreign entrant may use its bargaining power to enter the domestic market, without creating any rents for domestic scarce sector-specific assets. An implication for the tax authorities is then that the monitoring of capital gains acts as a substitute for the monitoring of profit shifting activities.

This paper demonstrates that some aspects of foreign acquisitions can be more complex than what is commonly perceived. Our results show that quite technical issues in the tax code, such as the treatment of goodwill deductibility, can have important effects on the pattern of foreign acquisitions, productive efficiency and tax revenues.

We have assumed the foreign country to be the low tax country. Modifying our model so as to allow the foreign country to be the high tax country would imply that increased foreign profit taxes trigger foreign acquisitions, since foreign firms would then benefit from transferring profits to the domestic country, thereby increasing their valuations. Indeed, Huizinga and Nicodème (2006) find empirical evidence that high domestic taxes as compared to host country taxes increase outward M&A activity.

It would be interesting to relate the effect on tax revenues from capital gains to the estimated losses in tax revenues that are due to the tax evading behavior of MNEs. Needless to say, undertaking such a study is quite a challenge as it is necessary to estimate what part of the takeover premium can be attributed to tax evasion. As transfer pricing is driven by tax differences between exporting and importing countries (Bernard et

al., 2006), one implication of our model is that the takeover premium should be higher when the differences in corporate profit taxes (and the levels of enforcement) are large. In particular, such an effect is expected to be larger whenever the scope for tax evasion is larger.

Further, it would be interesting to study how tax differentials between home- and host countries affect real measures of firm performance after a takeover. In particular, our results suggest that differences in capital gains taxes should have an impact on post-merger efficiency.<sup>31</sup> As capital gains taxes differ substantially across countries, estimating the empirical relevance of this mechanisms on outcomes such as profitability, sales, and employment would be highly informative from a policy perspective.

This paper suggests several avenues for future theoretical research. Endogenizing taxes, tax exemptions and tax credits in this framework would probably lead to new interesting results on tax competition, among other things.<sup>32</sup> Studying the long-run effects on the domestic and foreign investment pattern in this environment also seems fruitful.

Our analysis has focused on transfer pricing and the deductibility of goodwill as instruments affecting the tax incentives for acquisitions. But there are many other aspects of the tax system that are of importance such as the possibility to transfer reserves and loss carryforwards to the new firm. Incorporating these aspects into the analysis also seems a fruitful approach for future research.

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<sup>31</sup> Huizinga and Voget (2009) show empirically that the international tax system systematically affects organizational structure following international M&As.

<sup>32</sup> The importance of jointly analyzing tax rates and the rules governing international tax exemptions and tax credits in both home- and host countries is demonstrated by Huizinga and Nicodème (2006).

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