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**Investment Liberalization - Who Benefits from  
Cross-Border Mergers & Acquisitions?**

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# Investment Liberalization - Who Benefits from Cross-Border Mergers & Acquisitions?

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## **Abstract**

Investment liberalizing countries are often concerned that cross-border mergers & acquisitions might have an adverse effect on domestic firms and benefit multinational enterprises (MNEs). However, given that domestic assets are sufficiently scarce, we identify a preemption effect and an asset complementarity effect which imply that the acquisition price is substantially higher than the domestic seller's reservation price. The preemption effect also implies that the seller might capture some of the MNEs' initial rents. Moreover, other policies used in times of investment liberalization, such as restructuring, are explained through their effect on the value of the domestic assets.

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## 1. Introduction

In the last decade, we have witnessed a strong trend of investment liberalizations in developing and transition countries.<sup>1</sup> Despite the generally welcoming attitude towards inward Foreign Direct Investment (FDI) among investment liberalizing countries<sup>2</sup>, concerns are raised about the impact of cross-border mergers and acquisitions (M&As) on development.<sup>3</sup> One such concern is that underdeveloped equity markets or financial crises allow foreign entrants to acquire domestic firms at “too low” a price.<sup>4</sup> There is also a concern that cross-border M&As, in contrast to greenfield FDI (investment in new capital), do not increase the productive capacity and might lead to future lay-offs and the closing down of some activities. Some countries restricts the right of foreign individuals and firms to acquire domestic firms, or apply special restrictions to foreign firms in certain industries.<sup>5</sup>

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<sup>1</sup> Over the period 1991-1999, approximately 97 per cent of a total of 1035 changes in the regulatory Foreign Direct Investment (FDI) regimes of countries were in the direction of liberalization and mostly involved the opening of industries previously closed to FDI. These occurred in all types of industries: petroleum, mining, energy, airports, telecommunication, tourism, film making, banking and insurance, retail trading and pharmaceuticals. See World Investment Report (WIR) 2000.

<sup>2</sup> In the early 1990s, the value of inward FDI in developing countries was about \$50 billion and in the late 1990s, it exceeded \$200 billion. FDI today accounts for a large share of capital formation in these countries, and FDI inflows as a percentage of private capital formation in all industries have increased from 6.7 % in 1990 to 17.7% in 1998. The corresponding values for Central and Eastern Europe were 0.79% in 1990 and 16.2 % in 1998, respectively. See WIR 2000.

<sup>3</sup> The value of cross-border mergers and acquisitions (M&As) in developing countries has been growing rapidly since the mid-1990s and constitutes about one third of the FDI inflows in this period. The developing countries' share of world cross-border M&As increased from 2 % in 1987 to almost 9 % in 1999. (WIR, 2000).

<sup>4</sup> WIR 2000.

<sup>5</sup> This is the case in Malaysia and the Republic of Korea, for example. But the practise of countries in this respect has also changed over time. For instance, by May 1998, restrictions on foreign acquisitions of domestic shares in the stock market, and restrictions on M&As by foreigners in the Republic of Korea had been abolished. However, the new investment policy still

The first purpose of this paper is to study the impact on the host country of different liberalization programs with respect to cross-border M&As, by comparing two different liberalizations programs: (i) allowing greenfield investments but not cross-border M&As (referred to as a discriminatory policy) or (ii) allowing greenfield investments and cross-border M&As (referred to as a non-discriminatory policy).<sup>6</sup>

To this end, we make the following distinction between entry by acquisition and greenfield entry: the domestic assets are in scarce supply and the price is determined in an auction type acquisition game, whereas greenfield assets are not scarce and are sold at a fixed price. The limited availability of the first type of assets may be associated with the acquired firm having privileged access to distribution system, ownership of land or permits, knowledge of the specific characteristics of the local market, locally well-known brand names, or assets already in the market allowing early entry.<sup>7</sup>

To capture these aspects, we consider a model where a domestic firm is initially located in the market in the host country, H. There are also several MNEs located in the world market. The market in the host country will now be exposed to international competition. In the first stage, the MNEs might acquire the domestic firm's assets under the non-discriminatory policy, whereas no cross-border acquisition is allowed under the discriminatory policy. In the second stage, MNEs have the option of investing greenfield in favoring greenfield investment through, for instance, different tax treatments of M&A investments (WIR, 2000).

<sup>6</sup> Note that we do not address the issue of whether the host country should investment liberalize.

<sup>7</sup> This seems to be in line with the discussions in the business literature, where it is claimed that the main motivation for choosing M&As over greenfield investments is that the buyer then quickly obtains unique assets. See WIR 2000 and its reference to different studies of cross-border M&As.

new assets in country H. Finally, in the third stage, firms compete in oligopoly fashion in country H.

It is easy to identify circumstances under which MNEs might acquire domestic firms at “too low” a price when bargaining between the acquiring MNE and the seller takes place in isolation.<sup>8</sup> However, we show that, for two reasons, the acquisition price is higher, and possibly substantially higher, than the domestic firm’s reservation price when there are several potential MNE-buyers. The first is an *asset complementarity effect*. It is likely that the domestic assets are more efficiently used when transferred from domestic to foreign ownership, since MNEs are typically firms with strong firm-specific assets in terms of strong technology, know-how of marketing, organization etc.<sup>9</sup> If this efficiency difference is sufficiently large, a surplus is created when the domestic assets are transferred to an MNE.<sup>10</sup> However, due to the bidding competition between the MNEs for buying these assets, this entire surplus is captured by the target firm, i.e. the domestic firm. The second effect is a *preemption effect*.<sup>11</sup> If the domestic assets are more efficiently used by an MNE, it is likely that the profit of a non-acquiring MNE will decrease when the assets are transferred from domestic to foreign ownership, which implies that the MNE gains

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<sup>8</sup> The MNE may then, for instance, use informational or financial advantages in the bargaining, thereby acquiring the domestic firm at a price substantially below its “market value”.

<sup>9</sup> Indeed, FDI is considered to be an important channel for transferring new technology and knowledge into developing and transition countries (see, Caves (1996) or Markusen (1995)). Lipsey (2000) argues that, more generally, one of the major functions of FDI is to transfer assets from less efficient to more efficient owners and managers.

<sup>10</sup> This effect includes a market power effect, since there will be one firm less in the host market. However, the market power effect alone is not necessarily enough to make a merger profitable. For instance, it is not enough in a homogenous good Cournot model without variable cost savings, unless the merger gives rise to monopoly.

<sup>11</sup> Fridolfsson and Stennek (1999) and Horn and Persson (2001b) have identified this effect in merger formation models without greenfield investment.

from preventing other MNEs from obtaining the assets. Once more, due to the bidding competition between MNEs<sup>12</sup>, this entire surplus is captured by the domestic firm.<sup>13</sup>

The amount of productive capacity in the market might, however, be lower under the non-discriminatory policy (due to the acquisition of the domestic firm), which might lead to higher consumer prices. Hence, we may have a classical trade-off between efficiency and concentration. We show that if the MNEs' use of the domestic assets is sufficiently more efficient than that of the domestic firm, consumers will also be better off under the non-discriminatory policy. This suggests that competition policy, but not a discriminatory policy, might play an important role in these markets.

In some liberalization and privatization programs, we observe that governments use (or encourage) different types of restructuring prior to privatization (liberalization). Specific areas of restructuring include (1) a change in management and labor, (2) efficiency programs and (3) investment and de-investment programs.<sup>14</sup> Why would a government

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<sup>12</sup> The strategic motive for paying a high price for strategically important assets seems to have been important in the bidding competition over Banco do Estado de Sao Paulo (Banespa), the seventh-largest bank in Brazil. In November 2000, Banco Santander Central Hispanio (BSCH) won a controlling minority stake in Banespa, in competition with several other large banks, including its Spanish rival Banco Bilbao Vizcaya Argentaria (BBVA). According to Business Week (April 23, 2001): "It cost an astronomical \$3.55 billion, but it put BSCH back on top" (before BBVA - authors' comment). The assets of Banespa were considered strategically valuable as indicated by the following quote "Anyone who can add Banespa to their existing structure will take a gigantic leap forward," says Elio Duarte, director of institutional relations at the Brazilian subsidiary of Britain's HSBC Holdings PLC, one of the nine banks qualified to take part in the auction." (Business Week, November 20, 2000). According to Business Week (November 20, 2000), this means that "...bidders will pay a premium not just to get their hands on Banespa but also to stop rivals from doing so."

<sup>13</sup> From empirical studies on M&A performance, a robust finding in event studies is that target share holders benefit from a merger whereas the bidding firms' share holders generally break even (see Scherer and Ross, 1990).

<sup>14</sup> This was the case in, for instance, the Mexican privatization program in the 1980s and 1990s,

restructure instead of leaving it to the buyer to decide? The private buyer should be able to achieve these goals at the same cost and more in line with her specific needs. However, in an oligopoly, restructuring will have strategic product market effects that may give incentives for the government to restructure prior to privatization. We show that the government may have a stronger incentive to restructure, since it internalizes externalities on rival firms through the selling price of the target firm in the host country. A firm restructuring only takes into account how much its own profit will increase from the restructuring. The government, on the other hand, takes into account how the selling price increases; it increases from an increased profit for the buying firm but also from a lower profit for the non-buying firm, whose profits decrease due to its rival's restructuring. While this provides an argument for restructuring programs, a quick sale of the domestic assets is also shown to be important. A slow sale of domestic assets might imply that the first mover advantage from entering by a M&A is reduced, since greenfield entry then becomes closer in time. The slow selling will then reduce the sales price for two reasons: (i) it reduces the acquiring firm's product market profit, and (ii) it increases the non-acquiring firm's product market profit and thus reduces the non-acquirer's willingness to pay for the assets.<sup>15</sup> The paper ends with observations concerning the relation between tax policies and FDI, when FDI takes place by acquisitions. We find that a host country might benefit from international tax competition, since lower foreign taxes increase the acquisition price of their domestic target firms.

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see (Lopez-de-Silanes 1997).

<sup>15</sup> Lopez-de-Silanes (1997) has shown that a slow selling in the Mexican privatization program led to a substantially lower sales price.

The related theoretical literature on FDI and MNEs is surveyed in Markusen (1995). However, this literature does not explicitly address the welfare effects of the different entry modes: greenfield or acquisition of assets already in the market, or both.<sup>16</sup> There is also a small theoretical literature addressing aspects of cross-border mergers in international oligopoly markets.<sup>17</sup> However, the equilibrium acquisition price is not determined in those studies which is in focus here. Furthermore, to our knowledge, no paper in the privatization literature deals with determining the equilibrium buyer in a situation where potential buyers compete in an international oligopoly.<sup>18</sup>

The model is spelled out in Section 2. In Section 3, we derive the equilibrium ownership structure. Section 4 studies different specified merger policies. In Section 5, we make observations concerning restructuring policy and tax policy. Section 6 concludes. Finally, most proofs appear in the Appendix.

## 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 by an investment liberalization.<sup>19</sup>

We assume that there are  $M$  symmetric MNEs in the world market.<sup>20</sup> The MNEs do

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<sup>16</sup> See Markusen (1997) for a recent study of the effects of investment liberalization on FDI.

<sup>17</sup> This literature includes papers by, for example, Head and Reis (1997) and Horn and Persson (2001a).

<sup>18</sup> An exception is Norbäck and Persson (2001a). However, that paper studies privatizations in developed countries, where the bidding competition between domestic and foreign firms is at focus.

<sup>19</sup> It is of no consequence whether the market was previously open to imports.

<sup>20</sup> We take the number of MNEs,  $M$ , as exogenous as a consequence of large entry barriers into



not initially have any assets in Country H, but might now invest. The interaction takes place in three stages. In the first stage, the MNEs might acquire the domestic firm's assets under the non-discriminatory policy. Under the discriminatory policy, no acquisitions are allowed. In the second stage, MNEs can invest greenfield in new assets in country H, denoted  $k_G$ , at a fixed cost,  $\mathcal{G}$ . Finally, in the third stage, firms compete in oligopoly fashion in country H.<sup>21</sup>

To simplify the analysis, we assume investments into assets to be "lumpy", i.e. they come in discrete assets or plants and the domestic firm is not able to invest in stage two due to, for instance, financial or managerial restrictions. It can be shown that the main results of this paper would hold also if capital investments were continuous; the presentation would then be much more tedious, however.<sup>22</sup> We also assume that all  $M$  MNEs direct invest - either by acquiring the domestic firm, or investing greenfield. That is, we assume that direct investment is more profitable than other alternatives for supplying the market (i.e. exporting to the market).<sup>23</sup>

The next sections describe the product market interaction, the greenfield investment game, and the acquisition game.

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the industry. Moreover, we assume the size of the market in country H to be small compared to the world market.

<sup>21</sup> The choice of timing between the acquisition and the greenfield investment is not obvious in a general setting. In this particular application, however, it seems natural for the acquisition decision to be made before the greenfield decision, since the assets for sale already exist in the market and entering greenfield requires the construction of a new plant, which is usually time consuming.

<sup>22</sup> Proofs for the case with continuous capital investments are available from the authors upon request.

<sup>23</sup> It can be shown that the results derived below will also hold in a setting involving entry effects. This is at focus in a companion paper, Norbäck and Persson (2001b).

## 2.1. Stage two and three: investment - and product market interaction

The profits in the industry will depend on the distribution of asset ownership. For symmetry, we only need to distinguish between two types of ownership structures: (i) the one where the domestic assets are sold to one of the MNEs, denoted  $\mathbf{k}^m$ , and (ii) the one where the domestic assets remain in the hands of the domestic owner, denoted  $\mathbf{k}^d$ .

Vectors  $\mathbf{k}^m$  and  $\mathbf{k}^d$  are defined as follows:

$$\mathbf{k}^m = (0, \gamma \bar{k}, \underbrace{k_G, \dots, k_G}_{M-1}), \quad \gamma > 0 \quad (2.1)$$

$$\mathbf{k}^d = (\bar{k}, \underbrace{k_G, k_G, \dots, k_G}_M) \quad (2.2)$$

The first entry show the asset ownership of the domestic firm, the second entry is the asset ownership of the potentially acquiring MNE and the remaining entries show the asset ownership of the non-acquiring MNEs. Note that under domestic ownership, there are  $M$  MNEs that invest greenfield, whereas under MNE ownership, there is one acquiring MNE and  $M - 1$  non-acquiring MNEs investing greenfield.

Note that the change from domestic to foreign ownership might imply a more efficient use the local assets,  $\bar{k}$ . We define  $\gamma$  as measuring the *complementarity between the domestic assets  $\bar{k}$  and MNEs' firm-specific assets*. MNEs 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)). It is likely that at least some of this knowledge is transferred under a change of ownership, resulting in a more efficient use of the local assets  $\bar{k}$ . This corresponds to a  $\gamma$

substantially larger than one in the model.<sup>24 25</sup>

Under MNE ownership of the domestic assets  $\bar{k}$ , we let  $\pi_A(\mathbf{k}^m)$  denote the reduced-form product market profit for the acquiring MNE, while  $\pi_G(\mathbf{k}^m)$  denotes the corresponding profit for a non-acquiring MNE as a greenfield entrant. Under domestic ownership of assets  $\bar{k}$ , MNEs are greenfield entrants with profits  $\pi_G(\mathbf{k}^d)$ . The corresponding profit for the domestic firm under the respective ownership structures are  $\pi_d(\mathbf{k}^l)$ ,  $l = \{d, m\}$ .

We make the following assumptions about profits in the product market:

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

As the local assets  $\bar{k}$  will be used differently under domestic and foreign ownership, this will have strategic effects. Assumption 1 then states that an increase in complementarity,  $\gamma$ , increases the acquirer's profit, whereas the market profit for a non-acquirer (i.e. greenfield investor) decreases. The size of these effects depends on the strength of the complementarities between MNEs' firm-specific assets and the domestic assets. For example, the combination of an MNE's strong brand name and the acquired firm's knowledge of the market or strength in distribution may provide the acquiring MNE with a strong

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<sup>24</sup> There are many studies confirming that technologies and knowledge are transferred to host-countries through FDI (see Caves 1995). If foreign-owned firms are more efficient than domestically owned firms, some of the rents generated are likely to be captured by labour. Aitken, Harrison and Lipsey (1996) do find positive wage differentials between foreign and domestic enterprises in Mexico and Venezuela. On the other hand, Aitken and Harrison (1999) find that foreign-owned enterprises have higher total factor productivity than domestically owned ones only for plants with less than 50 employees. However, these studies do not compare the productivity in the plant before and after a foreign take-over, which would here be the appropriate measure.

<sup>25</sup> Our set-up here could be interpreted as the acquirer investing sequentially after the acquisition. To simplify the analysis, we assume this cost be zero. This assumption is relaxed in Section 5.1.

market position. If the brand name of the domestic assets are locally very strong, the strategic value of the assets will also be high. Or, if the domestic assets are sold at an early stage, the acquirer may gain a strong first-mover advantage, building up a dominant position in the product market.<sup>26</sup>

In assumption 2, we also take into account that the size of the local assets - not only the type of owner - may be of importance. A larger size of the domestic assets will benefit the owner irrespective of whether the owner is a foreign or a domestic firm.

**Assumption 2:**  $\frac{d\pi_A(\mathbf{k}^m)}{d\bar{k}} > 0$ ,  $\frac{d\pi_d(\mathbf{k}^d)}{d\bar{k}} > 0$ ,  $\frac{d\pi_G(\mathbf{k}^l)}{d\bar{k}} < 0$ ,  $l = \{m, d\}$ .

This set-up and these assumptions are compatible with several different oligopoly models. For example, Farrell and Shapiro (1996) studies exogenous assets ownership changes, assuming the product market competition to be Cournot. Under general assumptions on demand and costs, they show that an increase in capital for a firm (i) increases this firm's profit, while (ii) decreasing the profits of its competitors. Since an increase in  $\gamma$  or  $\bar{k}$  corresponds to an increase in effective asset ownership for the acquiring MNE, and the Farrell and Shapiro model (1996) is compatible with this set-up. Moreover, using a quantity-setting conjectural variation oligopoly model under a set of stability criteria, Dixit (1986) shows that a change, which is prima facie favorable for a firm, as is an increase in effective capital (through  $\gamma$  or  $\bar{k}$ ), reduces the profits of all other firms. To illustrate our results, we will in some parts of our analysis make use of a linear Cournot model.

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<sup>26</sup> As a specific example, in the retail industry, MNEs acquire local retail chains and combine their advantages of global sourcing with the advantages of the established distribution network. As Greenfield entry does not have this advantage, and it takes more time to build local assets, an acquiring MNE is at an advantage. While having the initial possession over the distribution network, a domestic firm lacks the advantage of global sourcing.

## 2.2. Stage one: the acquisition game

To focus on the bidding competition among MNEs as the determinant of the equilibrium buyer, we assume that firm  $d$  cannot make a bid on the MNEs. This assumption might be motivated by the domestic owner being financially weaker or lacking the competence to efficiently run the larger business. Moreover, it is assumed that MNEs cannot make bids on each other's firms. This assumption might be supported in two basic ways in a full merger model. One is to assume that the profit of a merged entity is small enough to imply that no merger takes place between the MNEs.<sup>27</sup> The second possibility would be to assume that mergers between MNEs would not be permitted by the competition authorities.

The acquisition process is depicted as an auction where  $M$  MNEs simultaneously post bids and the domestic firm then either accepts or rejects these bids.<sup>28</sup> Each MNE announces a bid,  $b_i$ , for the domestic firm.  $\mathbf{b} = (b_1, ..b_i, .., b_M) \in R^M$  is the vector of these bids. Following the announcement of  $\mathbf{b}$ , the domestic firm may be sold to one of the MNEs at the bid price or remain in the ownership of firm  $d$ . If more than one bid is accepted, the bidder with the highest bid obtains the domestic assets. If there is more than one MNE with such a bid, each such MNE obtains the assets with equal probability. The acquisition is solved for Nash equilibria in undominated pure strategies. There is a smallest amount,

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<sup>27</sup> For instance, it has been shown by Kamien and Zang (1990) that the hold up problem in merger formation might lead to no merger taking place in equilibrium, if the initial number of firms are sufficiently large. Moreover, mergers might be non-profitable since the costs associated with mergers can be substantial, for example due to problems of fusing together different company cultures.

<sup>28</sup> The main result in the acquisition game would also hold in a setting where the domestic firm states an asking price simultaneously with the MNEs' bids.

$\varepsilon$ , chosen such that all inequalities are preserved if  $\varepsilon$  is added or subtracted.

We now turn to the firms' valuations of the domestic firm's assets,  $\bar{k}$ . There are three different valuations which need to be considered:

- $v_{mm}$  is the value for an MNE of obtaining  $\bar{k}$  when a rival MNE would otherwise obtain  $\bar{k}$ . The first term shows the profit when possessing  $\bar{k}$ . The second term shows the profit if a rival MNE obtains  $\bar{k}$ , in which case the MNE invests greenfield.

$$v_{mm} = \pi_A(\mathbf{k}^m) - [\pi_G(\mathbf{k}^m) - \mathcal{G}] \quad (2.3)$$

- $v_{md}$  is the value for an MNE of obtaining  $\bar{k}$ , when the domestic firm would otherwise keep them. The profit for an MNE of not obtaining assets  $\bar{k}$  is different in this case due to the change of identity of the firm who otherwise would obtain the assets.

$$v_{md} = \pi_A(\mathbf{k}^m) - [\pi_G(\mathbf{k}^d) - \mathcal{G}] \quad (2.4)$$

- $v_d$  is the value for the domestic firm of obtaining  $\bar{k}$ . By assumption,  $\pi_d(\mathbf{k}^m) = 0$  and thus:

$$v_d = \pi_d(\mathbf{k}^d) \quad (2.5)$$

### 3. The equilibrium ownership structure

We can now proceed to solve for the Equilibrium Ownership Structure (EOS). The firms' bidding behavior is dependent on the relation between their own valuation of obtaining assets  $\bar{k}$  and all other firms' valuations of obtaining these assets. Since MNEs are symmetric, valuations  $v_{mm}$ ,  $v_{md}$  and  $v_d$  can be ordered in six different ways, as shown in table

3.1. These inequalities are useful for solving the model and illustrating the results. We can state the following lemma:

**Lemma 1.** *The equilibrium ownership structure and the acquisition price are described in table 3.1:*

**Proof.** See the Appendix. ■

Table 3.1: The equilibrium ownership structure and acquisition price.

Inequality:	Definition:	Ownership structure:	Acquisition price
$I1 :$	$v_{mm} > v_{md} > v_d$	$\mathbf{k}^m$	$v_{mm}$
$I2 :$	$v_{mm} > v_d > v_{md}$	$\mathbf{k}^m$	$v_{mm}$
$I3 :$	$v_{md} > v_{mm} > v_d$	$\mathbf{k}^m$	$v_{mm}$
$I4 :$	$v_{md} > v_d > v_{mm}$	$\mathbf{k}^m$	$v_d$
$I5 :$	$v_d > v_{mm} > v_{md}$	$\mathbf{k}^d$	.
$I6 :$	$v_d > v_{md} > v_{mm}$	$\mathbf{k}^d$	.

Lemma 1 shows that when one of the inequalities  $I1$ ,  $I3$ , or  $I4$  holds,  $\bar{k}$  is obtained by one of the MNEs. Under  $I1$  and  $I3$ , the acquiring MNE pays the acquisition price  $\mathcal{A} = v_{mm}$ , and  $\mathcal{A} = v_d$  under  $I4$ . When  $I5$  or  $I6$  holds, the domestic firm keeps its assets. When  $I2$  holds, there exist multiple equilibria.<sup>29</sup> In the next sections, we shall explore the policy implications of these findings.

<sup>29</sup> An equilibrium where firm  $d$  keeps the assets and no MNE posts a bid above  $v_d$ . There is also an equilibrium where one of the MNE's obtains the assets at a price  $v_{mm} - \varepsilon$  and another MNE posts the second highest bid at  $v_{mm} - 2\varepsilon$ .

## 4. Merger policy

Concerns have been raised in the policy debate about the impact of M&As on the development in developing countries, despite the generally welcoming attitude towards inward FDI. Arguments have been put forward, indicating that cross-border M&As do not increase productive capacity or that financial crises allow foreign entrants to acquire domestic firms at “too low” a price. More generally, MNEs are considered to benefit disproportionately from globalization, while local firms in developing countries are perceived as adversely affected. We address these issues by comparing two government policies: (i) A discriminatory policy which does not allow for cross-border M&As (henceforth denoted the *D-policy*), and (ii) a non-discriminatory policy allowing for cross border M&As (henceforth denoted the *ND-policy*).

### 4.1. Host-country welfare

The conventional welfare evaluation of M&As and market structures in an international oligopoly is typically made by comparing the sum of domestic consumer surplus and domestic profits in different market structures. We follow this approach, but add the sales price of firm  $d$ 's assets into the domestic welfare measure, when the domestic assets are sold. It follows that the ND- and D-policies only differ when an MNE acquires the domestic assets  $\bar{k}$  under the ND-policy, i.e. whenever one of the inequalities  $I1 - I4$  holds. Then, let  $W_{ND} = W(\mathbf{k}^m)$  denote the welfare level when an MNE obtains the domestic asset under the ND-policy, and let  $W_D = W(\mathbf{k}^d)$  denote the welfare level under the D-policy. Defining the difference in welfare  $W_{ND-D} = W(\mathbf{k}^m) - W(\mathbf{k}^d)$ , and rearranging terms, we obtain:



$$W_{ND-D} = [\mathcal{A} - \pi_d(\mathbf{k}^d)] + [CS(\mathbf{k}^m) - CS(\mathbf{k}^d)], \quad (4.1)$$

where  $\mathcal{A}$  is the acquisition price of assets  $\bar{k}$ ,  $\pi_d(\mathbf{k}^d)$  is the domestic firm's profit,  $CS(\mathbf{k}^d)$  the consumer surplus under domestic ownership of  $\bar{k}$ , and  $CS(\mathbf{k}^m)$  the consumer surplus under foreign ownership of  $\bar{k}$ . The first term in (4.1) captures the difference in producer surplus and the second term captures the difference in consumer surplus between the two policies.

We start by comparing the domestic producer surplus. It follows directly that if the assets are sold, the price is higher than the reservation price, i.e.  $\mathcal{A} > v_d = \pi_d(\mathbf{k}^d)$ . However, as shown in Lemma 1, the acquisition price will be the maximum of  $v_{mm}$  and  $v_d$ . The acquisition price may thus be substantially higher than the domestic firm's reservation price for which there are two reasons. To illustrate this, note that under II, the acquisitions price is equal to  $v_{mm}$ . The difference between the acquisition price,  $\mathcal{A}$ , and the domestic firm's reservation price,  $v_d$ , can then be rewritten as follows:

$$\begin{aligned} \mathcal{A} - v_d &= v_{mm} - v_d \\ &= [v_{md} - v_d] + [v_{mm} - v_{md}] \\ &= [\pi_A(\mathbf{k}^m) - (\pi_G(\mathbf{k}^d) - \mathcal{G}) - \pi_d(\mathbf{k}^d)] + [\pi_G(\mathbf{k}^d) - \pi_G(\mathbf{k}^m)], \end{aligned} \quad (4.2)$$

The first term in (4.2) is the *asset complementarity effect*. As argued above, it is likely that the domestic assets are more efficiently used when transferred from domestic to foreign ownership. If this efficiency difference is large enough, this will lead to a surplus when the assets are transferred to an MNE, i.e.,  $\pi_A(\mathbf{k}^m) - (\pi_G(\mathbf{k}^d) - \mathcal{G}) > \pi_d(\mathbf{k}^d)$ . Due to the bidding competition between the MNEs over the domestic assets, this entire surplus is captured

by the target firm, i.e. the domestic firm. The second term in (4.2) is the *preemption effect*. The profit of a non-acquiring MNE will decrease when the assets are transferred from domestic to foreign ownership, if the assets are used more efficiently by an MNE, i.e.  $\pi_G(\mathbf{k}^d) - \pi_G(\mathbf{k}^m) > 0$ . This implies that an MNE then gains from preventing another MNE from obtaining the assets. Once more, due to the bidding competition between the MNEs, this entire surplus is captured by the domestic firm. Consequently, the producer surplus may be higher, and possibly substantially higher, under the ND-policy.<sup>30</sup>

Turning to the consumer surplus, we know from the discussion above that the domestic assets might be more efficiently used when transferred from domestic to foreign ownership. This, in turn, may spill over in lower consumer prices. However, the number of greenfield entrants is lower under the ND-policy (due to the acquisition of the domestic firm) and hence we may have a classical trade-off between efficiency and concentration.

We can then derive the following result:

**Proposition 1.** (i) *The non-discriminatory policy leads to a higher domestic producer surplus and a higher or lower domestic consumer surplus than the discriminatory policy.*  
(ii) *the non-discriminatory policy leads to a higher domestic consumer surplus than the discriminatory policy in the Linear Cournot Model for a sufficiently large complementarity between the domestic assets and propriety assets of the MNEs,  $\gamma$ .*

**Proof.** See the Appendix. ■

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<sup>30</sup> This finding does not imply that an ND-policy always leads to a higher producer surplus, however. The domestic firm might be the preferred buyer if there are several domestic firms, since the acquirer does not pay for the aggregate externalities its acquisition creates.

Thus if the MNEs use the domestic assets sufficiently more efficiently than the domestic firm, consumers will also be better off under the non-discriminatory policy.

#### 4.1.1. The Linear Cournot Model

To illustrate how complementarities between the firm-specific assets of the MNEs and the domestic assets affect the equilibrium ownership structure and welfare, we use a linear Cournot model where demand is  $P = a - Q$ , and  $Q$  is total quantity. The marginal cost for a firm of type  $h$  is <sup>31</sup>

$$c_h = \begin{cases} c_A = c - \gamma \bar{k} \\ c_G = c - k_G \\ c_d = c - \bar{k} \end{cases} \quad (4.3)$$

The product market profits of the firms will be quadratic functions of their quantities, i.e.  $\pi_h = q_h^2$ . Assuming that marginal costs and firm quantities are positive (i.e.  $c_h > 0$  and  $q_h > 0$ ), the profits of the different types of firms as a function of the ownership structure are given in table A.1 in the appendix. In this table, we also provide expressions for consumer surplus and the acquisition price.

In fig 4.1, we illustrate how the equilibrium ownership structure (EOS) and the acquisition price are related to different values of the complementarity parameter  $\gamma$  and the size of the domestic assets  $\bar{k}$ . We see that  $\gamma$  must be sufficiently high for an acquisition to occur. Hence, cross-border acquisitions are associated with a more efficient use of the domestic assets (i.e.  $\gamma > 1$ ).

In figure 4.2, the consumer surplus effects of the different policies are depicted. Note

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<sup>31</sup> We used a wide range of parameter values and alternative specifications of both costs and demand without any qualitative changes of results.

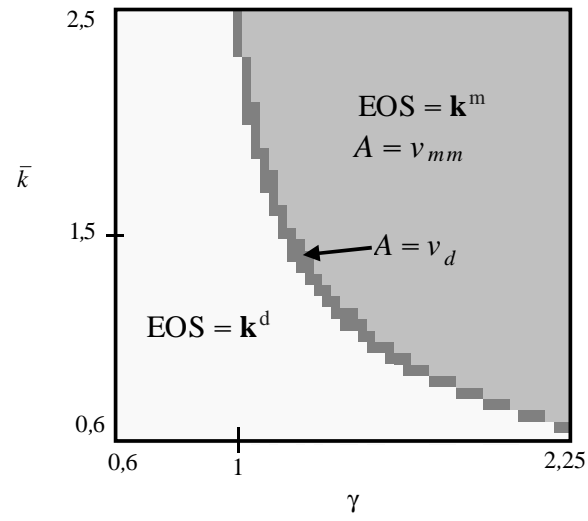


Figure 4.1: The Equilibrium Ownership Structure (EOS) in the linear Cournot model.

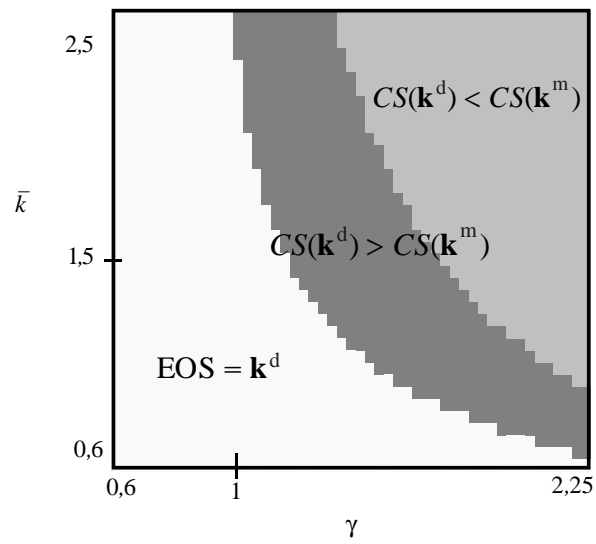


Figure 4.2: Consumer surplus under foreign ownership ( $\mathbf{k}^m$ ) and domestic ownership ( $\mathbf{k}^d$ ).

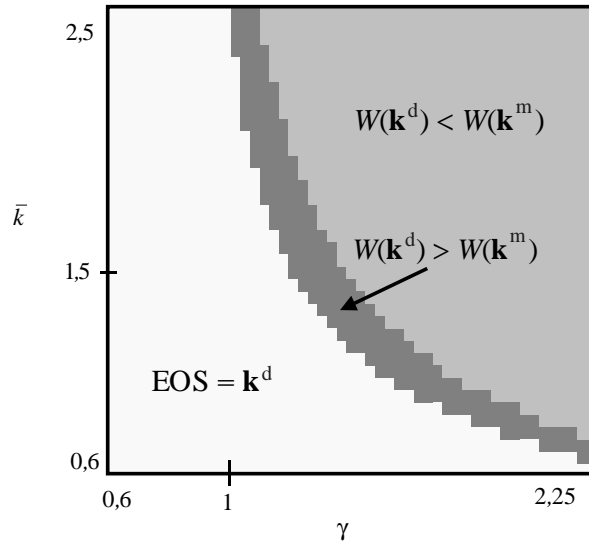


Figure 4.3: Welfare under foreign ownership ( $\mathbf{k}^m$ ) and domestic ownership ( $\mathbf{k}^d$ ).

that consumers gain from foreign ownership of the domestic assets when  $\gamma$  is sufficiently high, since a more efficient use of assets  $\bar{k}$  outweighs the negative effects of a more concentrated market structure. There is, however, a region where consumers are worse off from a foreign acquisition, and where the increase in efficiency is not large enough to outweigh a more concentrated market structure.

Considering total welfare, adding the acquisition price to consumer surplus, the region where the D-policy is preferred becomes much smaller. This can be seen by comparing figures 4.2 and 4.3.

#### 4.2. The effects on foreign producers (MNEs)

Let us now turn to the profit of an MNE under the two policies. Once more, the only difference between the policies is when the domestic assets are sold under the ND-policy, which is the case when I1, I2, I3, or I4 holds. The MNEs prefer the D-policy under I1 and

I2. To see this, note that the acquisition price is  $\mathcal{A} = v_{mm} > v_{md}$ . It then follows that an MNE's valuation of the domestic assets when the domestic firm holds the assets  $\bar{k}$  (as it does under the D-policy),  $v_{md}$ , is lower than the price this firm would pay under the ND-policy,  $v_{mm}$ . Consequently, MNEs prefer the D-policy in this interval. The D-policy "helps" MNEs avoid a bidding competition over the domestic assets that would be a loss for them.

Under I3, the acquisition price is  $\mathcal{A} = v_{mm} < v_{md}$ . MNEs then prefer the ND-policy, since the acquisition price is now lower than their willingness to pay, if firm  $d$  would otherwise keep its asset. Under I4,  $v_{md} > \mathcal{A} = v_d > v_{mm}$ . Consequently, MNEs prefer the ND-policy.

We then have the following result

**Proposition 2.** *MNEs prefer the discriminatory policy under I1 and I2, and the non-discriminatory policy under I3 and I4.*

Note that the MNEs benefit from the investment liberalization in general, since their profits are positive under either type of liberalization.

## 5. Additional policy issues

The above model can be used to make a couple of remarks on additional policy issues concerning cross-border M&As. We discuss restructuring policies and effects of tax evasion. To illuminate how cross-border M&As interact with these policies, we shall assume that parameter values are such that I1, I2 or I3 are fulfilled, so that equilibrium ownership structure is  $\mathbf{k}^m$ .

## 5.1. Why would a government encourage restructuring?

In some liberalization and privatization programs, we observe that governments use (or encourage) different types of restructuring prior to privatization (liberalization). Specific areas of restructuring include (1) change in management and labor, (2) efficiency programs (3) investment and de-investment programs.<sup>32</sup> Why would a government restructure instead of leaving it to the buyer to decide?<sup>33</sup> The private buyer should be able to achieve these goals at the same cost and more in line with her specific needs.<sup>34</sup> However, in an oligopoly, restructuring will have strategic product market effects that may give incentives for the government to restructure prior to privatization.

In order to study this issue, a first period, 0, is now included in the analysis, where the government may restructure the domestic assets into capacity  $\bar{k}_S$  from the initial level  $\bar{k}_0$ . In period 1, the acquiring firm may now restructure upon acquisition, given  $\bar{k}_S$ , restructuring into capacity  $\bar{k}_A$ . To focus on the strategic effects of restructuring, we assume that the cost of restructuring is equal for the government and the acquirer. Let

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<sup>32</sup> This was the case in, for instance, the Mexican privatization program in the 1980s and 1990s. See (Lopez-de-Silanes 1997).

<sup>33</sup> There are several reasons why the domestic (state) firm may not have restructured earlier under protection, when acquisition was not an option. First, new technologies might be used in the future that were previously not available due to protection or technological shifts. Second, incentives for restructuring under protection might have been low due to bad incentive schemes. For instance, Roland and Sekkat (2000) show that if there is asymmetric information on managerial skills, good managers have small incentives to exert effort in a socialist economy because of the ratchet effect. Moreover, in a context of career concerns, they show a positive incentive effect on preprivatization restructuring.

Finally, note that sequential investments are observed in many cross-border acquisition (WIR, 2000).

<sup>34</sup> Informational, political and financial restrictions could explain why governments should (sequentially) restructure prior to privatizations. (See for instance, Roland (1994).

$C'(\bar{k})$  denote the marginal cost of restructuring the domestic assets, where we assume that  $C'(\bar{k}) \geq 0$  and  $C''(\bar{k}) \geq 0$ . To simplify the notation, we write profit expressions as direct functions of  $\bar{k}$ ,  $\pi_h(\bar{k})$ , omitting the asset-ownership vector  $\mathbf{k}^m$  as an argument. In addition to Assumption 2, we assume  $\pi_A(\bar{k})$  to be strictly concave in  $\bar{k}$ , i.e.  $\frac{d\pi_A}{d\bar{k}} > 0$ , and  $\frac{d^2\pi_A}{d\bar{k}^2} < 0$ .

The game is solved backwards. Periods 3 and 2 are the same as in the previous sections. In period 1, given the choice of the government,  $\bar{k}_S$ , the acquirer maximizes  $\pi_A(\bar{k}_A) - C(\bar{k}_A)$  by choosing  $\bar{k}_A$  optimally, thereby facing the following marginal investment costs:

$$C'(\bar{k}_A; \bar{k}_S) = \begin{cases} 0 : \bar{k}_A \leq \bar{k}_S \\ C'(\bar{k}_A) : \bar{k}_A > \bar{k}_S \end{cases} \quad (5.1)$$

To proceed, we define the optimal choice by the private firm if the government would not invest at all (i.e.  $\bar{k}_S = \bar{k}_0$ ), as  $\bar{k}_A^P$ :

$$\frac{d\pi_A}{d\bar{k}} = C'(\bar{k}_A^P) \quad (5.2)$$

As illustrated in the upper diagram in figure 5.1, the optimal choice of  $\bar{k}_A$ ,  $\bar{k}_A^*$  is then:

$$\bar{k}_A^* = \begin{cases} \bar{k}_S : \bar{k}_A^P \leq \bar{k}_S \\ \bar{k}_A^P : \bar{k}_A^P > \bar{k}_S \end{cases} \quad (5.3)$$

Hence, whenever  $\bar{k}_A^P \leq \bar{k}_S$ , the acquiring MNE refrains from restructuring and just uses the (cost-less) capacity installed by the government,  $\bar{k}_S$ . Given that  $\bar{k}_A^P > \bar{k}_S$ , the optimal capacity  $\bar{k}_A^*$  is given by (5.2).

In period 0, the government internalizes the dependency of the acquirer's capacity investment,  $\bar{k}_A^*$ , on its own investment,  $\bar{k}_S$ . To focus on strategic product market effects, let us ignore consumer effects for the moment. The government then maximizes welfare by maximizing the acquisition price,  $\mathcal{A} = v_{mm}$ , net the restructuring cost. The government's



maximization problem is illustrated in the lower diagram in figure 5.1. Foreseeing the acquirer's optimal restructuring,  $\bar{k}_A^*$ , the marginal benefit of restructuring for  $\bar{k}_S \leq \bar{k}_A^P$  is simply  $C'(\bar{k})$ . The government then only affects the cost of achieving the acquirer's optimal restructuring, but these cost savings for the acquirer directly increases the acquisition price. Moreover, it follows from (5.3) that the level  $\bar{k}_A$  is not changed. However, if the government reflects on a capacity choice  $\bar{k}_S > \bar{k}_A^P$ , the first-order condition becomes:

$$\frac{d\mathcal{A}}{d\bar{k}} = \frac{d\pi_A}{d\bar{k}} - \frac{d\pi_G}{d\bar{k}} = C'(\bar{k}_S^*) \quad (5.4)$$

The optimal  $\bar{k}_S$  is indicated as  $\bar{k}_S^*$  in the lower diagram in figure 5.1. Comparing, expressions (5.2) and (5.4), we see that the government has stronger incentives to invest in capacity than the acquiring MNE. The government achieves a higher acquisition price by exploiting the negative externalities on the non-acquirers, captured by the term  $\frac{d\pi_G}{d\bar{k}} < 0$  from Assumption 2. This is illustrated in figure 5.1.

Thus we have the following result:

**Proposition 3.** *The government has a stronger incentive to restructure (encourage restructuring) the domestic assets than the acquiring firm, since it internalizes the externalities on rival firms through the selling price.*

It might be questioned whether the government has the ability to restructure as efficiently as the private firm. However, the above finding might explain why the government, even though it is inferior in restructuring, tries to do this.<sup>35</sup>

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<sup>35</sup> We are assuming that the acquirer can invest before greenfield investment takes place. If investment take place simultaneously, the incentive for the government to restructure would

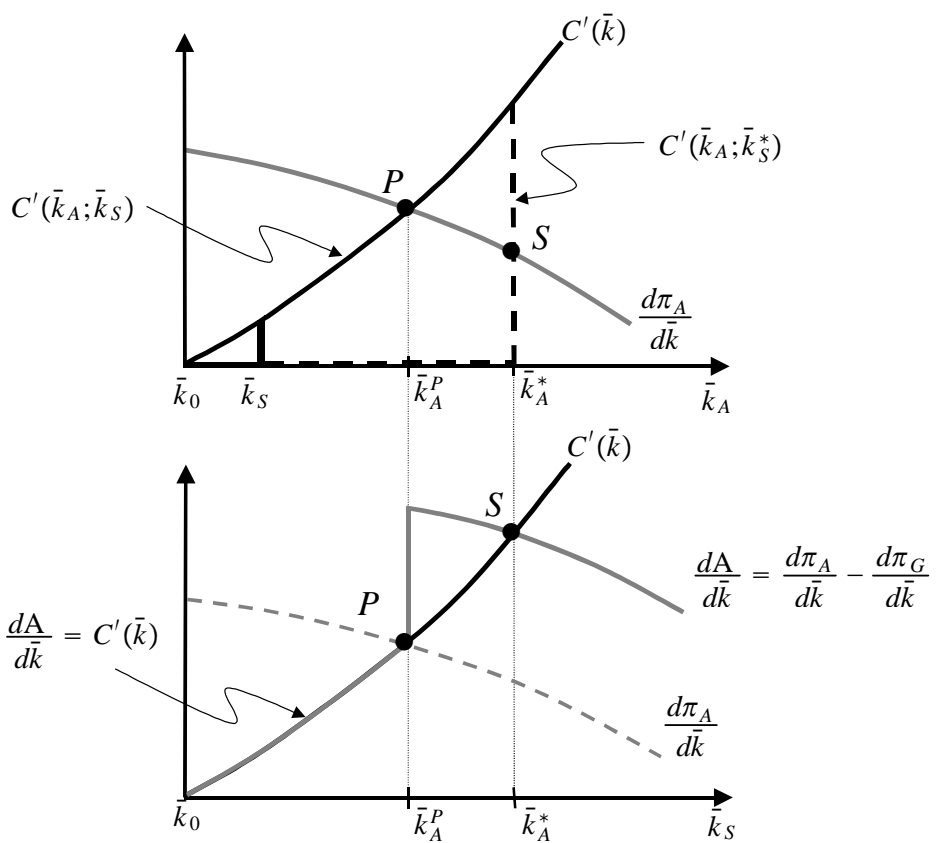


Figure 5.1: Comparing private and government incentives for restructuring.

In a welfare analysis, effects on consumers and other domestic firms should be taken into account. The consumer effect will increase the government's incentive to restructure, since restructuring creates lower prices. However, business stealing from domestic rivals will decrease the incentive for restructuring by the government, the total effect then being ambiguous. Comparing private and government incentives for restructuring.

## 5.2. The importance of speed in restructuring

While the result above provides an argument why governments use restructuring programs, the importance of selling the domestic assets quickly has also been argued to be important. Lopez-de-Silanes (1997) has shown that a slow selling in the Mexican privatization program lead to a substantially lower sales price. A slow selling of the assets may lead to lower productivity due to, for instance, managerial distraction and foregone investment opportunities. On the other hand, incentives may not deteriorate if career concerns make managers of SOEs eager to establish a good reputation in the labor market.<sup>36</sup> Here, we provide strategic product market arguments why a slow selling may lead to a substantially lower sales price.

If early entry is strategically valuable to create consumer loyalty or learning country specific characteristics, a slow selling of the domestic assets, i.e. a smaller gap in time between acquisition entry and greenfield entry, might then reduce  $\gamma$  in our setting. Noting increase further. The reason being that the government then has a possibility to commit to large investment, a commitment not available for the private buyer.

<sup>36</sup> See Roland and Sekkat (2000).

that  $d\gamma < 0$ , we have:

$$d\mathcal{A} = \left[ \frac{d\pi_A}{d\gamma} - \frac{d\pi_G}{d\gamma} \right] d\gamma < 0, \quad (5.5)$$

where  $\frac{d\pi_A}{d\gamma} > 0$  and  $\frac{d\pi_G}{d\gamma} < 0$  follow from Assumption 1.

A slow selling then leads to a lower sale price, since the delay reduces the acquirer's profit. However, the slow selling also implies that the profit of the non-acquiring firms increases. This, in turn, leads to an even further decrease in the sale price, since the willingness to pay for the assets then decreases even further. Thus, we have the following result:

**Proposition 4.** *A slow selling of domestic assets reduces the sales price for two reasons: (i) it reduces the acquiring firm's product market profit, and (ii) it increases the non-acquiring firm's product market profit and thus, reduces the non-acquirer's willingness to pay for the assets.*

### 5.3. Tax evasion

It has been argued that host countries might have problems in generating corporate taxes from MNEs investing in their countries, since MNEs can reduce their overall tax burden by shifting profits toward low tax countries and away from high tax countries.<sup>37</sup> Thus, countries are then hurt by tax reductions in other countries since their corporate tax income is reduced. The typical approach in this literature has been to study effects of corporate tax changes, taking the asset price as given, i.e. assuming that FDI is in the

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<sup>37</sup> It has been recognized that firms may employ transfer pricing techniques, allowing them to shift profits to low tax locations. For instance, Bartelsman and Beetsma (2000) find evidence that tax differences have a significant impact on where incomes are declared. See also the WIR 1998.

form of greenfield. However, in the case of FDI by acquisition, tax levels do not only affect domestic welfare by affecting the equilibrium market structure and tax revenues, but also by changes in asset prices. Here, we will illustrate effects of tax competition, when FDI take place through M&As which, to our knowledge, has not been previously pointed out .

Suppose that there is a foreign tax-haven offering a lower corporate tax rate than the host-country,  $t < t_H$ . Moreover, assume that the MNEs can use transfer pricing to completely avoid corporate taxes in the host-country. Since no MNE will pay taxes in the host country, the acquisition price becomes:

$$\mathcal{A} = (1 - t) [\pi_A - (\pi_G - \mathcal{G})] \quad (5.6)$$

where  $(1 - t) \pi_A$  is the after-tax product market profit of the acquirer and where the after-tax product market profit of a non-acquirer (greenfield entrant) net greenfield costs is  $(1 - t) (\pi_G - \mathcal{G})$ .

It follows from (5.6) that the acquisition price,  $\mathcal{A}$ , will be higher the lower is the tax rate in the foreign tax haven. The host country is better off when taxes are lower abroad, since a larger part of the foreign producer surplus can be repatriated to the host country.<sup>38</sup> Thus, we have the following result:

**Proposition 5.** *A host country might benefit from tax competition through an increased acquisition price of their domestic target firms.*

Note that the government can tax the domestic firm's owners for the proceeds of the

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<sup>38</sup> If the host country initially had the lower tax, and the other country (the tax haven) reduced its taxes below the level of the host country, the host country might be hurt, since the tax revenue might then decrease more than the acquisition price increases.

MNE acquisition, as long as the tax level is sufficiently low enough not to prevent the acquisition.<sup>39</sup>

## 6. Concluding discussion

In this paper, we have shown that investment liberalizing countries might forego the possibility of welfare enhancing M&As when having restrictions on cross-border M&As. The reason is that combining assets in these situations means a great possibility of creating a surplus for the firms involved, since MNEs are typically firms with strong firm-specific assets and local firms have access to country-specific assets. Moreover, if the domestic assets provide the acquirer with a strong position in the host market relative to other MNEs, MNEs gain from preventing other MNEs from obtaining the assets, thereby further increasing the surplus. We have then shown that if domestic assets are sufficiently scarce, the domestic firm will capture the created surplus.

Moreover, under the discriminatory policy, the domestic firm might be forced out of the market due to competition from the potentially more efficient MNEs. However, the domestic assets might be valuable for the MNEs and a cross-border M&A would take place if allowed. Consequently, by trying to protect the domestic producers from foreign M&As, the policy maker might cause the exit of domestic producers, and exit without any compensation.

We have also shown that other government policies used in times of investment liberalizations, such as restructuring and the timing of sales, could be explained through their

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<sup>39</sup> Note, that the host country benefits from the tax cut, even though it does not have domestic firms that could exploit the reduced tax abroad.

effect on the value of the domestic assets and the share of the surplus captured by the domestic owners in cross-border M&As.

The model put forward rests on some simplifying assumption, for example, we assume that MNEs make bids on the domestic firm's assets. The domestic owner could, however, use the payment for its assets to buy shares in the MNE (or its affiliate). Consequently, the model could be interpreted as a model of mergers. Moreover, the main results would also hold if the acquisition and greenfield decisions were assumed to take place simultaneously. To see this, note that as long as the domestic assets are scarce and their use by an MNE shifts profits from greenfield investors to the acquiring MNE,  $v_{mm}$  might be higher than  $v_{md}$  and  $v_d$ , and thus the domestic assets will then be sold at the price  $v_{mm}$ .

Governments often promote FDI to encourage "spillovers" from foreign to domestic firms. We have abstracted from the effects of spillovers in our analysis. At first sight, such spillovers seem to make a discriminatory policy more preferable, since there should be more domestic firms in the market receiving such spillovers under the discriminatory policy. However, while this argument is valid, there are some caveats. First, as argued above, domestic firms might be forced out of the market under the discriminatory policy and thus, the number of domestic firms might not be higher under the discriminatory policy. Second, recent empirically findings suggest that the ability to absorb spillovers is increasing in the share of foreign ownership.<sup>40</sup> If that is the case, a non-discriminatory policy becomes more preferable, since spillovers to "domestic firms" partly owned by foreigner will be higher.<sup>41</sup>

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<sup>40</sup> See Aitken and Harrison (1999).

<sup>41</sup> If infant-industry effects are important, a discriminatory policy might be preferable. However, not only cross-border M&As, but also greenfield investment, might then reduce welfare.

A crucial assumption is that the domestic assets are unique, i.e. there are no other domestic firms. Will the results in the paper hold if this assumption is relaxed? Our analysis seems valid for situations where the domestic assets are sufficiently scarce. For instance, the results derived here would hold if we had a smaller number of domestic firms, denoted  $D$ , than MNEs, denoted  $M$ , and each of the domestic firm's assets were auctioned out sequentially, and assuming that it would be profitable for an MNE to buy one domestic asset only. The analysis presented above would then apply when the assets of the last domestic firm are sold out. Assuming that  $\gamma$  is large enough then implies that an acquisition takes place at a price  $v_{mm}$ . In the second last period, assuming that the complementarity between MNEs' firm-specific assets and domestic assets,  $\gamma$ , is large enough, the price would be determined in the same fashion, i.e. the buying MNE being indifferent between buying and not buying. Consequently, the acquisition price for any of the assets would be  $\mathcal{A} = \pi_A(\mathbf{k}^m) - [\pi_G(\mathbf{k}^m) - \mathcal{G}]$ , where  $\mathbf{k}^m$  is the capital vector when  $D$  MNEs own one domestic asset each and  $M - D$  MNEs enter greenfield. It then follows that the results derived above hold.

If there were more domestic firms than MNEs, the situation might be very different. Assume that a domestic firm cannot make positive profits when the MNEs have entered. Then, in the last period, if there are two domestic firms left the remaining MNE could then play them out against each other, buying the assets at a price close to zero. In the second last period, the price will be determined in the same fashion and hence, the acquisition price for any of the assets will be close to zero.



## A. Appendix:

We first prove Lemma 1 and proposition 2. We then prove part (ii) of proposition 1 using a linear Cournot model.

### A.1. Proof of Lemma 1

#### A.1.1. Solving for the equilibrium buyer

First, note that  $b_i \geq \max v_{ml}$ ,  $l = \{d, m\}$  is a weakly dominated strategy, since no MNE will post a bid equal or above its maximum valuation of obtaining the assets and that firm  $d$  will accept a bid in stage 2, iff  $b_i > v_d$ .

**Inequality I1** Consider the equilibrium candidate  $\mathbf{b}^* = (b_1^*, b_2^*, \dots, yes)$ . Let us assume that MNE  $w \neq d$  is the MNE that has posted the highest bid and obtains the assets and firm  $s \neq d$  the MNE with the second highest bid.

Then,  $b_w^* \geq v_{mm}$  is a weakly dominated strategy.  $b_w^* < v_{mm} - \varepsilon$  is not an equilibrium, since firm  $j \neq w, d$  then benefits from deviating to  $b_j = b_w^* + \varepsilon$ , since it will then obtain the assets and pay a price lower than its valuation of obtaining them. If  $b_w^* = v_{mm} - \varepsilon$ , and  $b_s^* \in [v_{mm} - \varepsilon, v_{mm} - 2\varepsilon]$ , then no MNE has an incentive to deviate. By deviating to *no*, firm  $d$ 's payoff decreases since it foregoes a selling price exceeding its valuation,  $v_d$ . Accordingly, firm  $d$  has no incentive to deviate and thus  $\mathbf{b}^*$  is a Nash equilibrium.

Let  $\mathbf{b} = (b_1, \dots, b_m, no)$  be a Nash equilibrium. Let MNE  $h$  be the MNE with the highest bid. Firm  $d$  will then say *no* iff  $b_h \leq v_d$ . But MNE  $j \neq d$  will have the incentive to deviate to  $b^j = v_d + \varepsilon$  in period 1, since  $v_{md} > v_d$ . This contradicts the assumption that  $\mathbf{b}$  is a

Nash equilibrium.

**Inequality I2** Consider the equilibrium candidate  $\mathbf{b}^* = (b_1^*, b_2^*, \dots, y)$ . Then,  $b_w^* \geq v_{ij}$  is a weakly dominated strategy.  $b_w^* < v_{ij} - \varepsilon$  is not an equilibrium since firm  $j \neq w, d$  then benefits from deviating to  $b_j = b_w^* + \varepsilon$ , since it will then obtain the assets and pay a price lower than its valuation of obtaining them. If  $b_w^* = v_{mm} - \varepsilon$ , and  $b_s^* \in [v_{mm} - \varepsilon, v_{mm} - 2\varepsilon]$  then no MNE has an incentive to deviate. By deviating to *no*, firm  $d$ 's payoff decreases since it foregoes a selling price exceeding its valuation  $v_d$ . Accordingly, firm  $d$  has no incentive to deviate and thus,  $\mathbf{b}^*$  is a Nash equilibrium.

Consider the equilibrium candidate  $\mathbf{b}^{**} = (b_1^{**}, b_2^{**}, \dots, no)$ . Then,  $b_w^* > v_d$  is not an equilibrium since firm  $d$  would then benefit by deviating to *yes*. If  $b_w^* \leq v_d$ , then no MNE has an incentive to deviate. By deviating to *yes*, firm  $d$ 's payoff decreases since it then sells its assets at a price below its valuation,  $v_d$ . Firm  $d$  has no incentive to deviate and thus,  $\mathbf{b}^{**}$  is a Nash equilibrium.

**Inequality I3** Consider the equilibrium candidate  $\mathbf{b}^* = (b_1^*, b_2^*, \dots, yes)$ . Then,  $b_w^* \geq v_{mm}$  is a weakly dominated strategy.  $b_w^* < v_{mm} - \varepsilon$  is not an equilibrium since firm  $j \neq w, d$  then benefits from deviating to  $b_j = b_w^* + \varepsilon$ , since it will then obtain the assets and pay a price lower than its valuation of obtaining them. If  $b_w^* = v_{mm} - \varepsilon$ , and  $b_s^* \in [v_{mm} - \varepsilon, v_{mm} - 2\varepsilon]$ , then no MNE has an incentive to deviate. By deviating to *no*, firm  $d$ 's payoff decreases, since it foregoes a selling price exceeding its valuation  $v_d$ . Accordingly, firm  $d$  has no incentive to deviate and thus  $\mathbf{b}^*$  is a Nash equilibrium.

Let  $\mathbf{b} = (b_1, \dots, b_M, no)$  be a Nash equilibrium. Firm  $d$  will then say *no* iff  $b_h \leq v_d$ .

But MNE  $j \neq d$  will then have the incentive to deviate to  $b' = v_d + \varepsilon$  in stage 1, since  $v_{md} > v_d$ . This contradicts the assumption that  $\mathbf{b}$  is a Nash equilibrium.

**Inequality I4** Consider the equilibrium candidate  $\mathbf{b}^* = (b_1^*, b_2^*, \dots, yes)$ . Then,  $b_w^* > v_d$  is not an equilibrium since firm  $w$  would then benefit from deviating to  $b_w = v_d$ .  $b_w^* < v_d$  is not an equilibrium, since firm  $d$  would then not accept any bid. If  $b_w^* = v_d$ , then firm  $w$  has no incentive to deviate. By deviating to  $b'_j \leq b_w^*$ , firm  $j$ 's,  $j \neq w, d$ , payoff does not change. By deviating to  $b'_j > b_w^*$ , firm  $j$ 's payoff decreases since it must pay a price above its willingness to pay  $v_{mm}$ . Accordingly, firm  $j$  has no incentive to deviate. By deviating to *no*, firm  $d$ 's payoff does not change. Accordingly, firm  $d$  has no incentive to deviate and thus,  $\mathbf{b}^*$  is a Nash equilibrium.

Let  $\mathbf{b} = (b_1, \dots, b_m, no)$  be a Nash equilibrium. Firm  $d$  will then say *no* iff  $b_h \leq v_d$ . But MNE  $j \neq d$  will have the incentive to deviate to  $b' = v_d + \varepsilon$  in stage 1 since  $v_{md} > v_d$ , which contradicts the assumption that  $\mathbf{b}$  is a Nash equilibrium.

**Inequalities I5 or I6** Consider the equilibrium candidate  $\mathbf{b}^* = (b_1^*, b_2^*, \dots, no)$ , where  $b_i^* < v_d \forall i \in M$ . It then follows directly that no firm has an incentive to deviate and thus  $\mathbf{b}^*$  is a Nash equilibrium.

Then, note that firm  $d$  will accept a bid iff  $b_i \geq v_d$ . But  $b_i \geq v_d$  is a weakly dominated bid in these intervals, since  $v_d > \max\{v_{mm}, v_{md}\}$ . Thus, the assets will not be sold in these intervals.

## A.2. Proofs of statements concerning the Linear Model

Profits, consumer surplus and acquisition price for the linear model are given in table A.1, below.<sup>42</sup>

Table A.1: Profits, consumer surplus and acquisition price for the linear Cournot model in the two equilibrium ownership structures.

	<i>Domestic ownership, <math>\mathbf{k}^d</math></i>	<i>Foreign ownership, <math>\mathbf{k}^m</math></i>
$\pi_A :$	$\bullet$	$\left(\frac{\Lambda + M\gamma\bar{k} - (M-1)k_G}{M+1}\right)^2$
$\pi_G :$	$\left(\frac{\Lambda + 2k_G - \bar{k}}{M+2}\right)^2 - \mathcal{G}$	$\left(\frac{\Lambda - \gamma\bar{k} + 2k_G}{M+1}\right)^2 - \mathcal{G}$
$\pi_d :$	$\left(\frac{\Lambda + (M+1)\bar{k} - Mk_G}{M+2}\right)^2$	$\bullet$
$CS :$	$\frac{1}{2} \left(\frac{(M+1)\Lambda + \bar{k} + k_G M}{M+2}\right)^2$	$\frac{1}{2} \left(\frac{M\Lambda + (M-1)k_G + \gamma\bar{k}}{M+1}\right)^2$
$A :$	$\bullet$	$(\gamma\bar{k} - k_G) \frac{2\Lambda + \gamma\bar{k}(M-1) - k_G(M-3)}{M+1} + \mathcal{G}$

It can be noted that these profit functions fulfill both assumption 1 and assumption 2.

In the actual simulations shown in the text, we assume that  $M = 5$ ,  $\mathcal{G} = 0.1$ ,  $k_G = 1.5$  and  $\Lambda = a - c = 6$ . The simulations are then performed by using roughly 2000 combinations of  $\bar{k}$  and  $\gamma$  and solving the model for each such combination. The resulting equilibrium ownership structure (EOS), consumer surplus and welfare are shown in figures 4.1-4.3.

Finally, we may note from table A.1 that  $\frac{\partial \pi_d(\mathbf{k}^d)}{\partial k_G} = -\frac{2M[\Lambda + (M+1)k_1 - Mk_2]}{(M+2)^2} < 0$  and

<sup>42</sup>The acquisition price written out in table A.1 is  $A = v_{mm}$ , which holds under *I1*, *I2* or *I3*. Under *I4*, the acquisition price is  $A = v_d = \pi_d(\mathbf{k}^d)$ .

$\frac{\partial \pi_d(\mathbf{k}^d)}{\partial M} = \frac{-2[\Lambda+(M+1)k_1-Mk_2](\Lambda+2k_G-\bar{k})}{(M+2)^3} < 0$  holds. Then, if the aggregate capital stock due to greenfield investment  $Mxk_G$  is sufficiently large, the domestic firm may be forced out of the market under the discriminatory policy.

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