Cross-border acquisitions and optimal government policy

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Abstract

This paper analyses the optimality of policy specifications used to regulate the acquisition and operation of local firms by multinational enterprises. We emphasise the consequence of such regulations on the price of the domestic firm in the market for corporate control. We show that it is optimal to impose ceilings on foreign ownership of domestic firms when the government's objective is to maximise domestic shareholder profits, or a sum of those profits and tax revenues. While the optimal ceiling is high enough for the MNE to gain control of the domestic firm, it nevertheless influences the price that the MNE must pay for the domestic firm's shares to the advantage of the domestic shareholders. Surprisingly, stringent restrictions on transfer pricing turn out to be strictly suboptimal in this context.

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1 Introduction

Foreign direct investment (FDI) by multinational enterprises (MNEs) has grown significantly in recent years, both in the developed and developing world.[1] One of the ways in which a multinational enterprise (MNE) enters the domestic market in a host country is by acquiring a domestic firm (DF). Cross-border mergers account for well over half of all FDI and in fact considerably more than greenfield FDI (Neary, 2007). In developing countries, cross-border mergers and acquisitions are on the rise as well, and constitute about a third of the total FDI inflows in value terms (Norbäck and Persson, 2007).

Many of the domestic firms in some countries (e.g., India and China) were formerly in the public sector and wholly owned and operated by the government or one of its subsidiary departments. In developing countries where equity markets have only recently come into operation, large firms are often privately financed and held within tight industrial groups. This paper focuses on such a domestic firm with a single shareholder, which is a potential takeover target for an MNE. We analyse the formulation of government policy to maximise domestic benefits from the takeover.

Cross-border acquisitions are motivated by the possibility of significant benefits that may accrue to the MNE if it gains control of the DF. These benefits of control may derive from several different sources. For example, there may be a pre-existing vertical relationship between the MNE and the DF which is governed by a contract. It is well known that such arm's-length trading may give rise to inefficiencies stemming from asymmetries of information, or from the difficulty of including quality specifications in an enforceable contract (Williamson 1975). Vertical integration resulting from acquisition could lead to the elimination of these inefficiencies, thus producing corresponding benefits. Alternatively, the DF may form an important node in an elaborate network of inputs, outputs and markets for the MNE, and the MNE might not be able to take advantage of this link unless it had full control over the DF (as opposed to, for example, being merely an input supplier to the DF). After the MNE acquires the DF, these benefits may of course accrue either to the subsidiary or to the parent.

Although such benefits correspond to gains in efficiency which proceed from integration, most LDC governments impose substantial restrictions on acquisitions of domestic firms by MNEs. Presumably, it is felt that while the foreign owners of the MNE gain from such acquisitions, there are no corresponding benefits flowing to the erstwhile domestic owners. On the other hand, loss of domestic control over the operations of the firm may lead to outcomes inconsistent with domestic

[1] See sections 1.1 - 1.3 in Chapter 1 of Markusen (2002) for an overview of FDI inflows in recent years.

policy objectives. For example the MNE, once in control of the DF, may evade taxes in the host country by engaging in transfer pricing.[2]

In this paper, we present a different rationale for policies restricting the acquisition of domestic firms by foreign owners. When acquisitions are motivated by the existence of potential benefits, we show that policy can be designed so that the original domestic shareholders (DSH) of the acquired firm also obtain a share of the benefits. The optimal policy response is to impose a ceiling on the equity participation by the MNE in the DF. Further, restrictions must also be placed on the form of the offer that the MNE can make to purchase equity in the DF. We show that appropriately placed restrictions increase the payoff that the DSH obtains as a result of the transaction. The optimal ceiling is high enough for the MNE to gain control of the DF.

Restrictions on foreign ownership are the most obvious barriers to FDI and have been in effect in several countries (Golub, 2003). In India until mid-1990's, for projects which are not wholly export-oriented, the normal ceiling on foreign equity was 40%, 74% when advanced technology is involved. While it has opened up to trade, China still has several restrictions on foreign ownership. To a lesser degree, such ownership restrictions are also prevalent in a number of OECD countries. In Australia, since the privatisation of Qantas, a special federal act has ensured that Qantas remains majority Australian-owned. Majority domestic ownership is required in the airlines industries in the European Union and North American countries, telecommunications in Japan, and coastal and freshwater shipping in the United States (Golub, 2003). In Canada, foreign ownership restrictions are in place for a variety of sectors including telecommumications, transportation and financial services sector (Globerman, 1999).

An interesting implication of our analysis is that, if the government's only objective is to maximise the gains of the DSH, and if the ceiling on foreign ownership is set optimally, then the possibility of transfer pricing is not of concern to the government. Specifically we show that, in this case, restrictions on transfer pricing are either inconsequential or strictly suboptimal. Of course the government may still lose tax revenue if transfer pricing is allowed. However, even if the government's objective is to maximise the sum of tax revenues and DSH profits, restrictions on transfer pricing are not the appropriate tool to use.

[2] If the MNE supplies an input to a foreign subsidiary, and the subsidiary's host country taxes profits at a rate higher than the country of the parent company, then it is advantageous for the MNE to price the input above its production cost, and thus avoid profit taxes in the in the host country. This practice is known as transfer pricing. See Svejnar and Smith (1984) for a full elaboration of this argument. For an analysis of optimal transfer pricing regulation by a domestic government under asymmetric information about the MNE's production cost, see Prussa (1990).

Markusen (2002) provides an excellent survey of the theoretical literature on FDI and multinational firms. Concerning mergers and acquisitions, the particular kind of FDI that we consider here, there is a small but growing literature that examines the welfare impact of mergers and the role of competition policies in an international context (see, for example, Barros and Cabral, 1994; Head and Ries, 1997; Richardson, 1999; Horn and Levinsohn, 2001; Neary, 2007). More recent works on cross-border mergers examine endogenous formation of mergers (Horn and Persson, 2001; Lommerud, Straume and Sorgard, 2006) where both national as well as international mergers are allowed. While the modelling of product market competition is richer in these papers, none of these are concerned with the issue of control.

Falvey and Fried (1986) argue that restrictions on foreign ownership may be optimal because, in order to gain the necessary *domestic* equity participation, the MNE would be forced to show a level of profits which is acceptable to domestic investors. This may limit the extent of transfer pricing by the MNE. However, this argument assumes that the MNE is able to precommit to a level of profit for the domestic shareholders. In the treatment below, we do not assume such precommitment. Gangopadhyay and Gang (1995) focus on the issue of domestic versus foreign control. They show that the domestic government's tax revenues are maximised when control of the DF vests with the MNE, as opposed to the case where the DF is domestically owned and transactions with the MNE are at arm's-length by contractual arrangement. The issue of ownership restrictions is also important for their analysis. Absent such restrictions, the MNE can fully transfer price its profits away and thus avoid paying domestic taxes.

In a recent paper, Norbäck and Persson (2007) compare two policies concerning investment liberalisation: (i) allowing both greenfield investment as well as mergers and acquisitions or (ii) allowing greenfield FDI only. It might seem that allowing greenfield FDI only might be better as (i) is unlikely to reduce market concentration. However they show that prohibiting mergers and acquisitions might be counterproductive. If the domestic firm holds a scarce asset then competitive bidding among MNEs might fetch a high rent for the owners of the domestic firm provided there is sufficient complementarity between the assets of the domestic firm and the MNE. Thus, by ruling out mergers and acquisitions, the government may inadvertently lower domestic welfare.[3] Mattoo, Olarreaga and Saggi (2004) showed that in the presence of costly technology transfer, direct entry by foreign firms (i.e., greenfield FDI) might lower domestic welfare. In fact, the host country's government might prefer acquisition (by foreign firms) to greenfield FDI.

[3] See Norbäck and Persson (2008) for endogenous determination of acquisition price, acquisition pattern and greenfield investments in an oligopoly setting.

Our paper is related to this body of work, although the underlying mechanism is quite different. In our framework, there is only one MNE. Hence, unlike Norbäck and Persson (2008) competitive bidding does not arise. Central to our analysis is government policy. The government chooses the minimal level of profits, and a ceiling on the fraction of the domestic firm that can be under foreign ownership. At the optimum, the ceiling should not be so low that the MNE cannot exercise control. However, allowing unrestricted foreign ownership is strictly suboptimal.

The paper is organised as follows. The basic model is outlined in section 2. Section 3 considers the case where the objective of the government is to maximise the profit of the domestic shareholders. In section 4 we examine the consequences of a different objective function for the government—maximising the sum of domestic shareholders' profits and tax revenue. Section 5 concludes the paper.

2 The Model

Action centres around the control of a *domestic firm* (DF). There are three active agents, a domestic shareholder (DSH), a multinational (MNE), and the domestic government. *The control of the firm at time 0 lies with the domestic shareholder (DSH).*

Control refers to decision-making authority over important aspects of a firm's operation — e.g. production, pricing, and marketing. In the formal model, we equate control with the ownership of a certain fraction β of the firm's equity. A simple majority rule corresponds to a $\beta = \frac{1}{2}$. However, some firms may have in place "supermajority" rules that require an outsider to hold a larger fraction of shares in order to acquire control. Our analysis centres around the conditions under which the MNE may want to take over control of the DF, and the terms of such a transfer of control. The rationale behind a (potential) takeover is that the MNE may obtain some additional benefits (as discussed in section 1) if it gains control of the DF.

Let π^D be the net profit generated by the DF when under DSH control. Once the MNE acquires the DF, the latter may show lower profits because the MNE engages in transfer pricing—for example by charging artificially high prices for some input which the parent firm may supply to the DF. This results in a gain for the MNE shareholders (who are now in control) at the expense of any remaining domestic shareholders. MNE shareholders may also gain at the expense of the domestic government, since they avoid paying domestic profit taxes by showing lower profits.

The domestic government can regulate the extent of transfer pricing in various ways. Common methods used in LDCs include ceilings on the royalty payments which the DF makes to the parent firm, ceilings on the prices for inputs which the MNE charges the DF, and the imposition of indirect taxes on imported inputs. In effect, these regulations imply a minimum level of profits $\bar{\pi}$ which the DF must show when under MNE control. We will accordingly treat $\bar{\pi}$ as a policy variable for the domestic government, indicating the extent to which the government limits transfer pricing.

The sequencing of the moves is as follows:
Stage 1: The government announces its policy, which consists of the variable $\bar{\pi}$ as discussed above, and a ceiling on the fraction of the domestic firm that can be under foreign ownership. We denote this ceiling by γ.
Stage 2: The MNE learns about the potential benefits b which will result from acquisition or control. b is assumed to be a random variable drawn from a distribution $F(b)$, with support $[0, \bar{b}]$. This distribution is known to the government. After learning the realised value of b, the MNE decides whether or not to bid for control. If it does so, then it makes an offer (announces a price) to the DSH for some fraction of its shares.
Stage 3: DSH responds to the MNE's offer by tendering part or all of the shares at the announced price.[4]

We make the following assumptions about the acquisition process:

Assumption 1. *In order to obtain a controlling interest, a party must own strictly more than some fraction β of the DF's shares. We shall assume β to be exogenously given.*

Assumption 2. *All the shares of the DF are initially under the ownership of a single shareholder (the DSH).*

Assumption 3. *The MNE can make only* unconditional price offers *for the DF's shares. That is, it must announce a single price P per 100% of the DF's equity, and it may announce a maximum fraction δ of the equity it wants to buy. However, it must buy any quantity less than δ if that is all that is tendered.*

Assumption 3 needs some elaboration. In most equity markets, it is common for a potential acquirer to make a conditional offer where the acquirer commits to buy shares at a given offer price only if a sufficient number of shares are tendered. Clearly, in the present case the MNE would not

[4]Whether MNE knows b prior to stage 1 or draws b from a distribution in stage 1 does not change the analysis. The subsequent analysis will make clear that, if the government knows b, then it will set policy to extract the entire potential surplus from the MNE. If it does not, then the expected profit of the MNE is strictly positive (this happens when $b > \tilde{b}$ defined in the proof of Proposition 1). Thus, even if the MNE knew b from before, it is in the MNE's interest to not reveal b.

have an interest in purchasing shares if less than a fraction β were tendered. We will show later (in Proposition 2) that if conditional offers are allowed, then it is impossible for the government to extract any surplus from the MNE.

Thus in our framework, in which a single DSH owns the entire equity in the DF, the restriction to unconditional offers is a necessary component of the government's optimal policy. Many governments, especially in less-developed countries, place special conditions on acquisitions by foreign firms. Our analysis suggests that, in order to extract the maximum surplus, one of the required restrictions is that foreign acquirers only be allowed to make unconditional offers of acquisition. A qualitatively similar result would obtain if a fringe of minority shareholders owned less than a fraction β of shares, and a minority shareholder protection law was in effect. This is discussed following Proposition 2.

To evaluate the optimality of government policy, we need to specify an objective function for the government. We shall examine the consequences of the following alternative assumptions.

W1 The government's objective is to maximise the domestic shareholder's profits.[5]

W2 The government maximises the sum of DSH profits and its own tax revenue.

3 Maximising Shareholder Profits

In this section, we assume that the government's objective function is given by W1, and that the profit tax rate is zero. We are interested in finding the government's optimal choice of policy parameters $\bar{\pi}$ and γ. We do this by using a familiar sequential procedure. In Lemmas 1 and 2 we find the optimal response of the DSH (who has the last move) to a given price offer by the MNE and a policy choice for the government, and the corresponding optimal price offer by the MNE. Proposition 1 then derives the optimal policy choice for the government.

Let $\bar{\pi}$, γ be the government's choice of policy parameters. Let P be the price offered per 100% of the equity by the MNE, and let δ denote the fraction of equity it offers to buy. Clearly $\delta \leq \gamma$. We will characterise an offer by the pair (P, δ). The DSH can sell any fraction $\gamma' \leq \delta$ since the price offer is unconditional by Assumption 3.

The DSH will choose γ' to maximise:

$$\pi^{DSH} = \begin{cases} (1-\gamma')\bar{\pi} + P\gamma' & \text{if } \gamma' > \beta \quad \text{(control is transferred)} \\ (1-\gamma')\pi^{D} + P\gamma' & \text{if } \gamma' \leq \beta \quad \text{(control is not transferred)} \end{cases}$$

[5]If we assume that domestic profits are reinvested, then one can also justify this assumption by appealing to the fact that many LDC's are capital-scarce and maximising investment is a high priority for the government.

The MNE maximises:

$$\pi^{MNE} = \begin{cases} \pi^D + b - (1-\gamma')\bar{\pi} - \gamma' P & \text{if } \gamma' > \beta \quad \text{(control is transferred)} \\ \gamma'\pi^D - \gamma' P & \text{if } \gamma' \le \beta \quad \text{(control is not transferred)} \end{cases}$$

Consider first the decisions of the MNE and the DSH for given $\bar{\pi}$ and γ. Assume that $\bar{\pi} < \pi^D$. Note that, if the DSH retains control of the DF, then it can obtain profits at the rate of π^D on any shares it holds in the firm. If it transfers control then it makes a profit of $\bar{\pi} < \pi^D$ on retained shares. Thus to sell any shares at all, it must be offered a price which is at least π^D. At $P = \pi^D$, the DSH is indifferent between retaining all shares and selling up to β (recall that he must sell $\gamma' > \beta$ to transfer control to the MNE). At $P > \pi^D$, he clearly prefers selling at least β, and can thus obtain a net profit of $\beta(P - \pi^D)$ *while still maintaining control.* The decision regarding whether to hand over control to the MNE or not is thus based upon profits or losses with respect to the remaining fraction $(1-\beta)$ of the shares. Suppose he transfers control by selling another $(\gamma' - \beta)$. Since the DF will show operating profits of $\bar{\pi} < \pi^D$, it follows that he will realise capital losses to the amount $(1-\gamma')(\pi^D - \bar{\pi})$ on the shares he retains. Thus his capital gain on the $(\gamma' - \beta)$ must outweight this loss, i.e., in order to transfer control, we must have

$$(\gamma' - \beta)(P - \pi^D) \ge (1-\gamma')(\pi^D - \bar{\pi})$$

Since $\gamma' > \beta$ and $\pi^D > \bar{\pi}$, it follows that $P > \pi^D > \bar{\pi}$. But then the DSH will sell as much as it can, i.e. upto δ, since any retained shares yield only $\bar{\pi} < P$.

If the MNE is bidding for control, then it will clearly set P at the smallest value which satisfies the above condition, in which case the condition is satisfied with equality. Let $P(\delta)$ denote this price. This yields

$$(\delta - \beta)P(\delta) + (1-\delta)\bar{\pi} \;=\; (1-\beta)\pi^D$$

which implies

$$P(\delta) = [(1-\beta)\pi^D - (1-\delta)\bar{\pi}]/(\delta - \beta) \tag{1}$$

Thus the total profit realised by the DSH is

$$\begin{aligned} \delta P(\delta) + (1-\delta)\bar{\pi} &= \beta P(\delta) + (1-\beta)\pi^D \\ &= \beta(P(\delta) - \pi^D) + \pi^D \end{aligned}$$

i.e. the net capital gain realised, over and above the initial market value of the DF, is

$$\beta\xi(\delta) = \beta(P(\delta) - \pi^D)$$

Consider the premium $\xi(\delta) = P(\delta) - \pi^D$. This is calculated so that the DSH realises exactly as much capital gain on the last $(\delta - \beta)$ shares sold as is needed to compensate it for the capital loss $(\pi^D - \bar{\pi})$ on the $(1 - \delta)$ shares it retains. Since the MNE is restricted to an unconditional single-price offer, it must offer $P(\delta)$ on the entire fraction of shares it buys, hence the DSH realises a "free-rider" capital gain on the first β as well.

Now consider the MNE. It is correspondingly forced to pay a premium $\beta\xi(\delta)$ for control of the firm. This premium is minimised at $\delta = \gamma$, since $P(\delta)$ is decreasing in δ. However, the MNE obtains an additional benefit of b if it assumes control. Thus it will assume control if and only if $b \geq \beta\xi(\gamma)$. Substituting for $\xi(\gamma)$, we obtain

$$\begin{aligned}
b &\geq \beta[\frac{(1-\beta)\pi^D - (1-\gamma)\bar{\pi} - (\gamma-\beta)\pi^D}{(\gamma-\beta)}] \\
&= \frac{\beta}{\gamma-\beta}[(\pi^D - \bar{\pi})(1-\gamma)] \\
\Rightarrow \quad \gamma b - \beta b &\geq \beta(\pi^D - \bar{\pi}) - \gamma\beta(\pi^D - \bar{\pi}) \\
\Rightarrow \quad \gamma\beta[\frac{b}{\beta} + \pi^D - \bar{\pi}] &\geq \beta[b + \pi^D - \bar{\pi}]
\end{aligned}$$

which implies that

$$\gamma \geq \frac{b + \pi^D - \bar{\pi}}{\frac{b}{\beta} + \pi^D - \bar{\pi}} \equiv \bar{\gamma} \tag{2}$$

as the condition under which the MNE will assume control. This is summarised below as

Lemma 1. *Suppose $\bar{\pi} < \pi^D$. Then,*
(a) Given an offer (P, δ), where $\beta < \delta \leq \gamma$, the DSH will sell

$$\gamma' = \begin{cases} 0 & \text{if } P < \pi^D \\ \beta & \text{if } \pi^D \leq P < P(\delta) \\ \delta & \text{if } P \geq P(\delta) \end{cases}$$

(b) The MNE will offer $(P, \delta) = (P(\gamma), \gamma)$ if $\gamma \geq \bar{\gamma}$, and will make no offer otherwise.
where $P(.)$ and $\bar{\gamma}$ are as defined in (1) and (2).

Proof: See Appendix. □

Note that the premium is paid to compensate the DSH for the capital loss it will suffer as a result of the transfer of control. This loss occurs because $\bar{\pi}$ is set below π^D, i.e. some transfer pricing is permitted. This leads directly to the conclusion that

Lemma 2. *Suppose $\bar{\pi} > \pi^D$. If $\gamma \leq 1$, then*
(a) The MNE will offer (P, δ), where $P = \frac{\pi^D - (1-\beta)\bar{\pi}}{\beta} + \epsilon < \pi^D$, and $\delta = \beta + \epsilon_1$.
(b) The DSH will tender δ and get a profit of $\pi^D + \epsilon_2$,
where ϵ, and ϵ_1 are arbitrarily small.

Proof: Straightforward. $\square$

A higher overall surplus is generated when the MNE controls the DF. The object of lemmas 1 and 2 is to investigate whether, by precommitting to suitable values of γ and $\bar{\pi}$, the government can induce a transfer of some of this surplus to the DSH. *A priori*, it would seem that to achieve this $\bar{\pi}$ should be set greater than π^D. However, this intuition turns out to be false. Lemmas 1 and 2 show that in any optimal choice of the parameters, $\bar{\pi}$ must be strictly less than π^D, since $\bar{\pi} \geq \pi^D$ implies that, for any b, the DSH gets π^D, whereas $\bar{\pi} < \pi^D$ implies that it earns $\beta\xi$ over and above π^D.

Lemmas 1 and 2 indicate that, in the context of the takeover model, some degree of "dilution" is optimal for the domestic shareholders. Grossman and Hart (1980) have argued that dilution may allow the shareholders of a firm to get around a free-rider problem, which arises as follows. Suppose that a potential acquirer can increase the value of a firm, and each current shareholder is so small that his individual tender decision does not influence the outcome of a takeover bid. Clearly it is not in the interest of an individual shareholder to tender at a price below the post-takeover value of the firm. But then the acquirer has no incentive to take over. Shareholders can collectively overcome this problem by framing a constitution which allows the acquirer, after takeover, to reduce the value of the firm to those shareholders who have not tendered. This is known as *dilution.* Dilution can occur for example by the acquirer issuing to himself shares which are not matched by new equity, or through a sale of some assets of the target firm below their true value to another firm owned by the acquirer, or through transfer pricing.

Setting $\bar{\pi}$ below π^D in our model (which implies that the government allows some transfer pricing) amounts to dilution. Although there is no free-rider problem here in the sense of Grossman and Hart since there is a single shareholder, dilution is still optimal. By setting $\bar{\pi}$ below π^D, the government allows the DSH to obtain a capital gain on the fraction β of his shares.

We now come to the question of optimal choice of the policy parameters γ and $\bar{\pi}$. The government sets these policy parameters in Stage 1, based on the distribution $F(b)$ from which b will be drawn in Stage 2.

Proposition 1. *(a) The optimal maximum ownership restriction γ is strictly greater than β and strictly less than one,*

(b) at the optimum, the minimum profit requirement $\bar{\pi}$ is strictly less than π^D,

(c) for any $\bar{\pi} < \pi^D$, there is a $\gamma \in (\beta, 1)$ such that the optimum is attained, and

(d) the probability of takeover is independent of $\bar{\pi}$, π^D, and β.

Proof: From lemmas 1 and 2, we can restrict attention to $\bar{\pi} < \pi^D$, which is part (b). Define with a bid of $P(\gamma)$, where $P(\gamma)$ is as given in lemma 1.

Let b^* denote the level of benefits such that the MNE is indifferent between acquiring and not acquiring. Then b^* must satisfy

$$y(b^*) \;=\; 0 \tag{3}$$

Also by virtue of lemma 1, we have

$$(\gamma - \beta)\; P(\gamma) \;=\; (1-\beta)\;\pi^D \;-\; (1-\gamma)\bar{\pi} \tag{4}$$

It can be readily checked that (3) and (4) imply

$$\gamma \;=\; \frac{b^* + \pi^D - \bar{\pi}}{\frac{b^*}{\beta} + \pi^D - \bar{\pi}} \tag{5}$$

Now using (3) and (4) one can check that $y'(b) > 0$, hence $y(b) \gtreqless 0$ as $b \gtreqless b^*$. Thus only an MNE which draws $b > b^*$ will bid to acquire the firm.

The expected profit for the DSH is given by

$$\int_{b^*}^{\bar{b}} \{\gamma P(\gamma) \;+\; (1-\gamma)\bar{\pi}\} dF \quad + \quad F(b^*)\pi^D$$

Using equation (3), we can write the government's maximisation problem as

$$\max_{b^*} \; \int_{b^*}^{\bar{b}} \{b^* + \pi^D\} dF \quad + \quad F(b^*)\pi^D$$

which is equivalent to

$$\max_{b^*} \;\; b^*(1 - F(b^*)) \tag{6}$$

Let $\tilde{b}$ be the value of b^* which solves (6). Then $\tilde{b}$ satisfies the first-order condition $\tilde{b} \;=\; \frac{1-F(\tilde{b})}{f(\tilde{b})}$. Clearly $\bar{b} > \tilde{b} > 0$. Part (d) of the proposition follows immediately because $\tilde{b}$ is independent of $\bar{\pi}$, π^D and β.

Part (c) follows because there is a degree of freedom in equation (5); given any $\bar{\pi} < \pi^D$, one can find an appropriate γ such that the required $\tilde{b}$ is obtained.

Finally, the fact that $\tilde{b} > 0$, together with $\pi^D > \bar{\pi}$, implies that $\beta < \gamma < 1$, so part (a) follows. □

Part (a) of proposition 1 shows that imposing ownership restrictions is always optimal.[6] Part (b) of the proposition indicates the irrelevance of restrictions on transfer pricing. Provided that γ is set optimally with respect to $\bar{\pi}$, the level of post-takeover accounting profits of the DF does not matter. In particular, the government could let $\bar{\pi} = 0$,[7] i.e., allow full transfer pricing.

The reasoning for part (a) of Proposition 1 is subtle.[8] It is evident from equation (1) that if all shares are for sale, i.e. $\delta = 1$, the purchasing price is equal to the pre-acquisition profits; $P = \pi^D$. That is, the DSH get no surplus from sale. By restricting the number of shares the MNE can take over, the government imposes a cost on the DSH if the MNE takes control. The reason is that MNE will shift profits abroad, leaving DSH with less than they used to have; $\bar{\pi} < \pi^D$. To compensate for the loss, the MNE needs to raise $P(\delta)$. But this also increases the payoff to the DSH if it decides to sell less than β; i.e., not to give the MNE control. In this way, the bargaining position of the DSH increases; and the MNE has to offer a rent over and above π^D in order to make DSH give the control of the company to the MNE. In a sense, by restricting quantity of shares supplied, the government acts as a monoposonist.

Next we show that, if the government is to extract any surplus from the MNE, then it is necessary to restrict the MNE to make unconditional offers (see Assumption 3). Suppose instead that the MNE can make a *conditional offer* as follows. The MNE offers a price P and announces a fraction $\delta \in (0, \gamma]$ such that, if at least a fraction δ of the shares are tendered, then the MNE will buy all tendered shares up to γ at a price P, however, if strictly less than δ shares are tendered then the MNE is not obliged to buy any shares at all. Let $\bar{\pi}$ and γ be prescribed by the government as before.

Proposition 2. *If the MNE is allowed to make a conditional offer, then in equilibrium control will be transferred to the MNE, the DSH will obtain a profit of π^D, and the MNE will retain the entire benefit of control b.*

Proof: Clearly the DSH must get a total payoff of at least π^D in order to tender any shares. Let (P, δ) be such that

[6] It is clear from the analysis that if the MNE owns some non-controlling share of the DF's equity in period 0, then the profits accruing to the DF as a result of takeover would be decreasing in the MNE's initial ownership proportion. This may explain why recently many countries are imposing lower initial MNE holdings for joint ventures.

[7] Owing to limited liability on the part of shareholders, negative values for post-takeover profits are not relevant.

[8] We thank an anonymous referee for suggesting this reasoning.

$$P\delta + \bar{\pi}(1-\delta) = \pi^D \tag{7}$$

Then the DSH gets a payoff of exactly π^D if it tenders δ.

Clearly for any $\delta \in (0,1)$ we have

$$P \gtreqless \pi^D \quad \text{as} \quad \bar{\pi} \lesseqgtr \pi^D$$

Hence, if $\bar{\pi} > \pi^D \;\Rightarrow\; P < \pi^D$ then DSH will want to retain as much equity as is consistent with a transfer of control, so let $\delta = \beta + \epsilon$ for arbitrarily small ϵ and calculate P accordingly from (7). If $\bar{\pi} < \pi^D \;\Rightarrow\; P > \pi^D$, then the DSH will want to sell as much equity as regulations permit, so set $\delta = \gamma$ and calculate P appropriately. If $\bar{\pi} = \pi^D \;\Rightarrow\; P = \pi^D$ then the DSH is indifferent between selling and retaining equity and any $\delta \in (\beta, \gamma]$ is sufficient.

The proposition then follows from (7). □

Propositions 1 and 2 make clear that the unconditional offer clause is the reason why the DSH can extract surplus from the MNE. The MNE must offer a premium over π^D on the last $\gamma - \beta$ shares to compensate the DSH for its future loss on the γ shares it must continue to hold. However, the unconditional nature of the offer then extends this premium to the first β shares as well, though the DSH would have been willing to sell these shares at π^D. It is this free-rider effect on the first β shares that transfers surplus to the DSH.

Suppose now that the first β shares is held by small "fringe" shareholders, and only the remaining $1 - \beta$ is held by the DSH. Acquiring the shares held by the fringe is not sufficient to obtain control; the MNE must negotiate with the DSH for that purpose. Since the DSH is obliged by law to retain at least γ shares, the MNE must still offer the DSH a price premium over π^D. Then the transfer of surplus will take place as in Proposition 1 if the MNE is required to offer the same price to minority shareholders as it offers to the DSH.

Many countries in fact have in place regulations to protect minority shareholders which stipulate that, in the case of a takeover, minority or "outside" shareholders must be offered the opportunity to sell their shares to the acquirer at the same price that the acquirer paid to the majority shareholder who was in control prior to the takeover.[9] It is easy to see that, in the presence of fringe shareholders, such a regulation would yield the same outcome as in our model. Our assumption—that government

[9] See Bruslerie and Deffains-Crapsky 2005, sections 1 and 2, for details. In particular, they write "Within a takeover bid, in Great Britain and in France outside shareholders benefit from protection organized by financial regulation. More precisely, they can sell their shares at the acquisition bid price to the initiator of the takeover even if the latter does not want to acquire 100% of the equity."

policy restricts foreign acquirers to unconditional offers—yields a simpler analysis, which is why we have opted for a model with a single shareholder and unconditional offers, rather than a fringe of minority shareholders together with a regulation that protects them.

4 Profit Taxes and Alternative Objective Function

In this section, we assume that profits are taxed at a rate τ in the host country. This rate is previously set, and not a policy variable.[10] The tax rate in the MNE's country of origin is less than τ—for simplicity we assume that it is zero. Given the profit tax, the objective of the domestic government is to set γ and $\bar{\pi}$ to maximise the sum of DSH profits and its own tax revenue (given by W2)

As a result of the tax rate τ, equation (3) is now replaced by

$$y(b^*) \ = \ b^* \ + \ \gamma(1-\tau)\bar{\pi} \ + \ (\pi^D \ - \ \bar{\pi}) \ - \ P\gamma \ = \ 0 \tag{8}$$

where P is given by

$$\gamma P \ + \ (1-\gamma)(1-\tau)\bar{\pi} \ = \ \beta P \ + \ (1-\tau)(1-\beta)\pi^D$$

Note that P so defined implies that the DSH is indifferent between tendering β or γ of its shares. We assume that at this value of P it will tender γ.

Rearranging we get

$$(\gamma-\beta)P \ = \ (1-\tau)[(1-\beta)\pi^D \ - \ (1-\gamma)\bar{\pi}] \tag{9}$$

Suppose the government sets $\bar{\pi} < \pi^D$. Then as before, using the analogue of Lemma 1 and equation (8), we can write the governments payoff (the sum of taxes and DSH profits) as

$$\begin{aligned} W_2^1 \ &= \ \int_{b^*}^{\bar{b}} \{\gamma P \ + \ (1-\tau)(1-\gamma)\bar{\pi}\}dF \ + \ [1-F(b^*)]\tau\bar{\pi} \ + \ F(b^*)(1-\tau)\pi^D \ + \ F(b^*)\tau\pi^D \\ &= \ \int_{b^*}^{\bar{b}} \{b^* \ - \ \tau\bar{\pi} \ + \ \pi^D\}dF \ + \ [1-F(b^*)]\tau\bar{\pi} \ + \ F(b^*)(1-\tau)\pi^D \ + \ F(b^*)\tau\pi^D \\ &= \ b^*[1-F(b^*)] \ + \ \pi^D \end{aligned}$$

[10]Corporate tax rates may be different for domestic and foreign firms, but it is unlikely that the government can impose different rates for different foreign firms, perhaps even in the same industry. We therefore assume that the industry-wide tax rate is set prior to the present optimisation exercise, and is hence exogenous to the problem we are considering.

Note that W_2^1 is independent of τ and $\bar{\pi}$, and is equal to the DSH's expected profit in the taxless case. Thus the cutoff value b^*, which is implemented by choice of γ, is also given by $\tilde{b}$ which solves (6). Using (8) and (9) one can easily show the optimal restriction $\gamma(\tau)$ to be

$$\gamma(\tau) \;=\; \frac{\tilde{b} \;+\; \pi^D \;-\; \bar{\pi}}{\frac{\tilde{b}}{\beta} \;+\; (\frac{t}{\beta} + 1 - t)(\pi^D \;-\; \bar{\pi})}$$

It can readily be verified that $\beta < \gamma(\tau) < 1$.

Now consider $\bar{\pi} > \pi^D$. Since the DF can have a maximum profit of $\pi^D + b$ after acquisition, the lowest value of b for which the MNE will acquire the DF is now given by

$$b^{**} \;=\; \bar{\pi} \;-\; \pi^D$$

since for $b < b^{**}$ the DF (under MNE control) cannot show profits in excess of $\bar{\pi}$.[11] Also note from Lemma 2 that, in this case, the DSH only sells a fraction β of the shares (so the restriction γ is redundant), and gets no premium. The payoff to the domestic government is given by

$$\begin{aligned} W_2^2 \quad &= \quad F(b^{**})\tau\pi^D \;+\; (\pi^D + b^{**})\tau[1 - F(b^{**})] \;+\; (1-\tau)\pi^D \\ &= \quad \tau b^{**}[1 - F(b^{**})] \;+\; \pi^D \end{aligned}$$

Since τ must be less than unity and since $\tilde{b}$ maximises $b[1 - F(b)]$, it follows that $W_2^2 < W_2^1$. Thus, restricting $\bar{\pi}$ above π^D is still suboptimal. It is also clear that, so long as $\bar{\pi} < \pi^D$ and γ is set optimally (i.e. $\gamma = \gamma(\tau)$), the level of $\bar{\pi}$ does not matter, as in Proposition 1.

5 Conclusion

This paper analysed the optimality of policy specifications used to regulate the acquisition and operation of local firms by multinational corporations. The policy instruments consist of limits on

[11] We are implicitly assuming that the government cannot induce *reverse transfer pricing* by setting $\bar{\pi}$ higher than this. In fact it can be checked from Lemma 2 that acquisition remains profitable even when $\bar{\pi}$ is set higher. Since $\bar{\pi} > \pi^D$, the DSH is willing to sell his shares for a price lower than π^D in the expectation of a higher profit later. (However, in this case no premium accrues to the DSH.) We assume, that when this future profit requires reverse transfer pricing (e.g. it requires the MNE to price its supplied input below cost in order to show the required profit), this promise is not credible to the DSH.

Alternatively, we could use a condition that the price P per 100% of equity which the MNE offers for the shares cannot be negative. From Lemma 2, it will be clear that, if $\bar{\pi}$ is sufficiently greater than π^D the DSH would be willing to transfer control even at some negative price per share. The conclusion which follows stands in substance under either assumption—the one we are making simplifies the algebra.

transfer pricing of the imported inputs and limits on the extent of foreign ownership of domestic firms. The model presented here explicitly considers the effect of these policies on the price of the firm, thus taking into account capital gains which would accrue to the domestic owners in a rational expectations world.

If the objective of the government is to maximise the net gain of the domestic shareholder, restrictions on foreign ownership—often imposed in many developing countries—turns out to be the crucial element in any optimal policy. The effect of ownership restrictions is to reduce the probability of takeovers. Acquisition occurs if the benefits from integration are sufficiently high, and in these cases, part of the rent is transferred to the domestic owners of the firm. Stringent restrictions on transfer pricing turn out to be strictly suboptimal in this context. These conclusions carry over to the case where the government maximizes the sum of tax revenues and DSH profits.

Appendix

Proof of Lemma 1: Let γ' be the amount of equity that the DSH sells.

Proof of (a)

Define $\pi_1^D(\gamma') = (1-\gamma')\bar{\pi} + P\gamma'$, and

$\pi_2^D(\gamma') = (1-\gamma')\pi^D + P\gamma'$,

i.e. π_1^D is the DSH's profit if control is transferred ($\gamma' > \beta$), and π_2^D is that if control is not transferred ($\gamma' \leq \beta$).

(i) Suppose $P \leq \pi^D$.

Then for $\gamma' > 0$, $\bar{\pi} < \pi^D$ implies that $\pi_1^D(\gamma') < \pi^D$ and $\pi_2^D(\gamma') \leq \pi^D$. Therefore $\gamma' = 0$ is optimal.

(ii) Suppose $\pi^D < P < P(\delta)$.

$\frac{d\pi_2^D}{d\gamma'} = -\pi^D + P > 0$, hence for $\gamma' \leq \beta$, $\gamma' = \beta$ maximises profit.

$\frac{d\pi_1^D}{d\gamma'} = -\bar{\pi} + P > 0$, hence for $\beta < \gamma' \leq \delta$, $\gamma' = \delta$ maximises profit.

Now $[\pi_1^D(\delta) - \pi_2^D(\beta)] = (1-\delta)\bar{\pi} + \delta P - (1-\beta)\pi^D - \beta P$

$= [(1-\delta)\bar{\pi} - (1-\beta)\pi^D] + (\delta - \beta)P$

$< [(1-\delta)\bar{\pi} - (1-\beta)\pi^D] + (\delta - \beta)P(\delta)$

$< [(1-\delta)\bar{\pi} - (1-\beta)\pi^D] + [(1-\beta)\pi^D - (1-\delta)\bar{\pi}] = 0$

Hence $\gamma' = \beta$ is optimal.

(iii) If $P \geq P(\delta)$, then it can be shown exactly as in (ii) above that β (resp. δ) is the optimal amount to sell in the case where control is not transferred (resp. is transferred), and that $\pi_1^D(\delta) - \pi_2^D(\beta) \geq 0$ according as $P \geq P(\delta)$, implying $\gamma' = \delta$ is optimal.

Proof of (b):

It follows from (a) that, in order to acquire control, the MNE must offer to buy a fraction $\delta > \beta$ at a price $P \geq P(\delta)$, and that at this price it will be offered exactly a fraction δ of the shares. Assuming it offers exactly a price $P(\delta)$, the MNE's profit at $t = 1$ is

$\pi_1^M(\delta) = (\pi^D - \bar{\pi}) + b + \delta\bar{\pi} - \delta P(\delta)$

where the first term represents profits from transfer pricing, b is its private benefit from control, $\delta\bar{\pi}$ is its share of the accounting profits of the DF, and the last term is the amount paid for the shares. Now, substituting the expression for $P(\delta)$, it can be readily checked that $\pi_1^M(\delta)$ is increasing in δ. Thus if the MNE bids for control at all, it will offer $(\gamma, P(\gamma))$ and its profit will be $\pi_1^M(\gamma)$.

Alternatively, the MNE may bid a pair (δ, P) such that $\beta < \delta \leq \gamma$ and $\pi^D \leq P < P(\delta)$. Then it obtains a fraction β of the shares, hence its profits are

$\pi_2^M = \beta\pi^D - P\beta.$

It follows immediately that a price of $\pi^D < P < P(\delta)$ is strictly inferior to $P = \pi^D$, and the MNE is indifferent between buying β shares at $P = \pi^D$, and not buying any shares at all.

It can be easily checked that the same conclusion obtains if the MNE makes an offer (δ, P) where $\delta \leq \beta$.

The choice is therefore between acquiring control, in which case it gets $\pi_1^M(\gamma)$, and not buying any shares, in which case it gets 0. Now substituting the value of $P(\gamma)$ yields, on manipulation, the equivalence

$$\pi_1^M(\gamma) \; \geq \; 0 \qquad \Leftrightarrow \qquad \gamma \; \geq \; \frac{b + \pi^D - \bar{\pi}}{\frac{b}{\beta} + \pi^D - \bar{\pi}} \;\; \equiv \;\; \bar{\gamma}(b)$$

Note that $\beta < 1 \; \Rightarrow \bar{\gamma}(b) < 1$. □

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