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# Cross-Border Mergers & Acquisitions with financially constrained owners

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## Abstract

Mergers give acquirers control over the assets of the merged entity and give sellers control over financial assets. We propose a cross-border merger model with home biased financially constrained owners in which the subsequent investments of the buyer and the seller can be determined. We show that policies blocking foreign acquisitions to protect the domestic industry can be counterproductive. Foreign acquisition can increase domestic owners' investment in growth industries by reducing their financial restrictions. This calls for a "financial efficiency" defence in merger law. We also show that cross-border M&As are partly driven by the seller's alternative investment opportunities.

*Keywords:* Investment Liberalization, Mergers & Acquisitions, Corporate Governance, Ownership. *JEL classification:* F23, K21, L13, O12

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# 1 Introduction

While many countries abolished restrictions on foreigners' possibilities to acquire domestic firms during the 1990s and early 2000s, a reversion to a more protectionist view could be observed in the mid 2000s. For instance, in 2005, the rumors about a takeover bid of the French dairy producer Danone by the American company PepsiCo provoked an outcry on the French political arena. A few weeks later, the French government officially proposed to shield ten "strategic" industries, including biotechnologies and secure information systems, from foreign acquisitions. This trend has then continued. In 2010, the Canadian government blocked the mining giant BHP Billiton's hostile takeover bid for the fertiliser group Potash Corporation with the motivation that it was not convinced that the deal was in the Canadian interest.<sup>1</sup>

The main economic argument put forward in the policy debate for why countries prefer their firms to be buyers rather than sellers in cross-border mergers and acquisitions (M&As) is that corporate owners have a home country bias in corporate decisions such as production and investment. In fact, a home country bias is observed in various firm activities, such as in production (Delgado, 2006), trade (Wolf, 2000), and R&D (Belderbos, Leten and Suzuki, 2013). While the argument for favoring domestic corporate ownership has some economic merits, we show in this paper that the argument is incomplete. Indeed, we show that blocking acquisitions by foreign owners (or stimulating foreign acquisitions by domestic owners) can be counterproductive, leading to less investment in the domestic country since less financial capital becomes available to (home biased) domestic corporate owners. Moreover, blocking foreign acquisitions might also lead to less foreign financial capital being "locked into" domestic firm-specific assets.

To this end, we develop a theoretical model where firm-level negotiations determine the buyer and seller identities in a cross-border M&A. Firms, either domestic or foreign, are active in a mature international market and possibly also in a new international growth market, and are assumed to have a home bias in the location of their investments. The novel feature of our model is that it captures the fact that a large share of sellers in cross-border M&As is owners that will use the proceeds to undertake other corporate investments. First, a large share of all sellers is conglomerates that divest affiliates.<sup>2</sup> Second, in many countries, sellers in cross-border M&As are corporate owner groups (families) that will use the proceeds to fund other corporate investments.<sup>3</sup> To capture the fact that both buyers and sellers are active in product markets post acquisition, we assume that the two owners (owner groups) are unique in their ability to manage firms and will invest in new assets after the acquisition has taken place. Moreover, we assume that the owners are financially constrained so when they borrow money for new investment, the interest rate becomes higher the more

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<sup>1</sup>BBC, November 3 2010. *Canada blocks BHP takeover bid for Potash*Canada blocks BHP takeover bid for Potash. <http://www.bbc.co.uk/news/world-us-canada-11680181>.

<sup>2</sup>See, for instance, Maksimovic and Phillipps (2002).

<sup>3</sup>See Morck (2005) and Gourevitch and Shinn (2005).

they borrow.

We use a Nash bargaining solution to determine the surplus division in an acquisition when the roles of buyer and seller are given. However, this will not suffice to determine the buyer and seller identities in the bargaining game. We solve this by applying the equilibrium ownership-structure model proposed by Horn and Persson (2001a) and find that the direction of the sale is determined by the industry structure that gives the highest aggregate post-acquisition profits. This finding has several implications: (i) an owner may sell corporate assets to a less efficient owner if its use of cash to finance other corporate investments compensates for this loss, and (ii) an improved outside investment opportunity for an owner may trigger a corporate sale and may benefit the acquirer through a lower acquisition price.

We then turn to implications for the international investment pattern of the outcome in the acquisition bargaining game. We show that a foreign acquisition increases the domestic firm's investments in the growth industry, while it decreases the investments of the foreign firm. The reason is that the domestic firm's owner will become financially stronger due to the sale of its assets in the mature industry, thereby reducing the financial cost when borrowing to invest in the growth industry. In fact, the domestic country may obtain an increased capital stock even if the foreign owner shuts down the domestic production of mature products since the increase in investment in the growth industry may be substantial. The foreign owner, on the other hand, becomes financially weaker since part of her financial capital is "locked in" the mature industry. The foreign owner will therefore reduce her investment in the growth industry, which will reduce the capital stock in her home country.

Then, we examine the implications of our results for (international) merger policy. In most countries, an Antitrust Authority (AA) scrutinizes the market for corporate control and has the ability to put restrictions on mergers or outright block them. In most jurisdictions, the AA bases its decision on the assessment of whether the merger-specific efficiency gains are likely to offset the higher market power enjoyed by the merging firms. The typical assumption is that merger-specific efficiencies accrue to the buyer but, as mentioned above, an acquisition can create merger-specific financial efficiencies that the seller exploits in other markets. Then, we establish that a financial efficiency defence in the merger law can improve the efficiency by inducing a more efficient use of ownership skills when owners are financially constrained.

An alternative to blocking foreign acquisitions is to put restrictions on shutting down the selling firm's plant in the mature industry. This would preserve jobs in the mature industry while, at the same time, ensuring a transition to the emerging industry. However, we show that such a policy can be counterproductive. By putting restrictions on the acquiring firm's use of the mature assets, the government will inadvertently reduce the acquisition price, which reduces investments in the growth industry.

The investment strategy of Investor (the largest investment bank in Sweden) in the last decade is an example where the selling of firms in mature industries has led to investments in growth industries in the domestic country. Between

1999 and 2009, Investor almost trebled the share of its portfolio invested in new growth markets, while at the same time scaling back more traditional investments where it controlled a few very large firms. 62 percent of these new investments went to the Nordic region (Investor Annual Report 2001, 2010). Selling to foreign investors does not seem to have affected the number of Swedish employees in these firms in any remarkable way either. For example, the selling of Scania, the most notable of Investor’s transactions, has not lead to a decrease in the number employed in its Swedish operations; rather this number did somewhat increase over the decade as Investor started to scale down its ownership (Scania Annual Report 2000, 2009).<sup>4</sup> The view that the selling country can be the winner in a giant cross-border M&A was also put forward when Finnish Nokia sold its devices division to U.S. Microsoft. Finland’s minister for Trade and European Affairs then expressed the view that Finland benefited both from foreign financial capital being locked into Finnish industry-specific capital (the devices division) and Finnish corporate owners (Nokia) getting more financial strength from the deal by saying: “We should look at the silver lining [. . .] From now on we will have two huge information technology giants in Finland.”<sup>56</sup>

Our paper is related to the literature addressing welfare aspects of cross-border mergers in international oligopoly markets. This literature clarifies how cross-border mergers affect profits and welfare, depending on, for example, trade costs and domestic institutions (see e.g. Head and Ries (1997); Horn and Persson (2001b); Lommerud, Straume and Sorgard (2004); and Neary (2007)). Our paper is also related to the literature on cross-border M&As and greenfield investment which emphasizes that greenfield investments and cross-border acquisitions are not perfect substitutes, and have different determinants and welfare effects (see, for instance, Bjorvatn (2004); Nocke and Yeaple (2007, 2008); Mattoo, Olarrega and Saggi,(2004); Norbäck and Persson, (2007, 2008); or Raff, Ryan and Stähler (2005)). We add to this literature by examining how financial restrictions affect cross-border merger activity and subsequent investment. In particular, we show that selling domestic industry-specific assets to foreign owners can increase domestic investment by easing home-biased domestic owners’ investment in new industries, thereby increasing domestic welfare.<sup>7</sup>

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<sup>4</sup>The selling of Scania was conducted in several steps, but in 1999 Investor went from controlling 49.3 percent of the votes to controlling only 15.3 percent.

<sup>5</sup>Bloomberg, September 4 2013. *Finns Mourn Loss of Icon Nokia as Microsoft Takes Over*. <http://www.bloomberg.com/news/articles/2013-09-03/finns-mourn-loss-of-icon-nokia-as-microsoft-takes-over>.

<sup>6</sup>*The Economist*, November 23 2013. *Planning the next bounceback*. <http://http://www.economist.com/news/business/21590363-after-sale-its-devices-division-microsoft-what-was-once-worlds-biggest>.

<sup>7</sup>Norbäck, Tekun-Koru and Waldkirch (2015) empirically examine divestments of foreign affiliates in Swedish multinational firms. They find that larger affiliates are more likely to be divested, but an increase in the relative size of an affiliate reduces the probability of divestiture. These results are broadly consistent with the buyer and seller interacting in order to organize their production in a mutually beneficial way, as suggested by this paper. Norbäck, Tekun-Koru and Waldkirch (2016) use a much simplified version of the model in this paper to discuss the empirical results. Their model, however, assumes the identity of the seller to be exogenous and that investments are discrete. Moreover, no policy analysis is conducted. In contrast,

The paper also relates to a small literature on endogenous mergers where “who merges with whom” is the central question and there is an explicit modeling of the acquisition game (see, for instance, Fridolfsson and Stennek (2005), Horn and Persson (2001a) and Kamien and Zang (1993)). We add to this literature by providing a model where the identity of the acquirer and the seller can be determined in an environment where both the buyer and the seller may make sequential investments. The previous merger literature has shown that access to markets, low production costs, synergies, and market power all drive mergers. We identify another important factor: the seller’s need for financial resources to invest in new growth markets. Moreover, we show that a financial efficiency defence in the merger law can improve the efficiency by inducing a more efficient use of corporate ownership skills.

The paper adds to the literature that examines the interaction between financial structures and product markets. For example, Brander and Lewis (1986) demonstrated that limited liability commits a leveraged firm to produce more output in the product market since shareholders care more about positive than negative states of the world. Cestone and Fumagalli (2005) show that business groups with efficient internal capital markets may channel resources to either a more or a less profitable unit. Banal-Estañol and Ottaviani (2006) show that merging firms take both diversification and the strategic effects into account when determining the optimal contractual split of profits. We add to this literature by showing that differences in financial restrictions and abilities affect the allocation of owner-specific ability and industry-specific capital in the product market. Finally, the paper relates to the literature on industrial reorganization in the financial literature that shows that changes in owner productivity and the cost of new capital can trigger M&A activity, causing more productive owners to buy assets from less productive ones (see Jovanovic and Rosseau (2002); and Maksimovic and Phillips (2002)). We add to this by showing that financial constraints may affect this pattern by triggering mergers where efficient owners sell industry-specific assets to invest in even more productive assets in other industries.

## 2 Cross-border M&As and the market for corporate control: Background

In this section, we describe institutional facts on which we will build our model of cross-border M&As and the international market for corporate control and investments. It is well established that cross-border mergers and acquisitions play a key role in the global industrial development and restructuring process. In particular, many studies examine how the change in ownership affects the performance of the merged entity.<sup>8</sup> This focus seems motivated in the case of

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determining the identity of the seller and the buyer, examining the impact on the amount of investments and drawing policy conclusions are key features in this paper.

<sup>8</sup>In the finance literature see, for instance, Maksimovic and Phillipps (2002) for theoretical work and Andrade, Mitchell and Stafford (2001) and Maksimovic and Phillipps (2001) for

widely dispersed corporate ownership and when the whole firm is sold, since the seller of the target firm's shares will then likely not affect firm behavior in other companies post acquisition.

However, there are two reasons why we should also examine the post acquisition behavior of the seller.

First, a large share of all assets sales is affiliate or plant sales that generate a cash flow for the seller. Several studies have documented a relationship between liquidity availability and investments (see, e.g., Fazzari, Hubbard and Petersen, 1988; Hoshi, Kashap and Scharfstein, 1991), and several have found asset sales to be a significant determinant of subsequent investment (e.g. Bates, 2005; Hovakimian and Titman, 2006; Warusawitharana, 2008; Ding, Guariglia and Knight, 2012; and Borisova and Brown, 2013). Maksimovic and Phillips (2001) examine a large sample of U.S. plant-level data for the period 1974-92 observing an active market for corporate assets, with close to 7 percent of the plants changing ownership annually through mergers, acquisitions and asset sales in peak expansion years of the economy. Partial firm sales account for more than half of these transactions. The proceeds of these sales are largely used for corporate investments within the divesting firm. Furthermore, after a divestiture, sellers tend to refocus, i.e. they do not reenter the market segment they just divested. Dittmar and Shivdasani (2003) report that divesting firms are usually not closely related to the segment they divest – only in about one eighth of all cases are they in the same three-digit SIC. Ahn and Denis (2004) document that the corporate focus increases after spin-offs.

Second, a large share of sellers of corporate assets are business groups or families.<sup>9</sup> La Porta, Lopez-de-Silanes and Shleifer (1999) traced the control chains of a sample of 30 firms in each of 27 countries, and documented the ultimate controlling owners and how they achieved control rights in excess of their ownership rights through deviations from the one-share-one vote rule, pyramiding, and cross-holdings. Claessens, Djankov and Lang (2000) carried out a similar task for 2,980 listed firms in nine East Asian countries. They found significant discrepancies between ultimate ownership and control, allowing a small number of families to control firms representing a large percentage of stock market capitalization. Faccio and Lang (2002) examined the ultimate ownership and control of 5,232 corporations in 13 Western European countries, and found that, typically, firms are widely held (36.93%) or family controlled (44.29%). Widely held firms were more important in the UK and Ireland, family controlled firms were more important in continental Europe.

Consequently, a large share of owners of corporate assets are families or business groups that will likely use the proceeds from the sales of some of their

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empirical work.

In the IO literature see, for instance, Salant (1983) and Farrell and Shapiro (1990) for theoretical work and Kim and Singal (1993) for empirical work.

<sup>9</sup>There are two basic models of corporate governance of public firms: (i) dispersed ownership and management control; and (ii) concentrated ownership and private blockholder control. The first model predominates in the Anglo-American world, where common law judicial systems largely govern. The second model, which exists in several varieties, dominates in virtually all other countries (Morck, 2005; Gourevitch and Shinn, 2005).

assets in other investments within the family or business group. An example of this is the shift in corporate ownership that has taken place in Sweden over the last two decades. Henrekson and Jakobson (2012) document that the influence on the Swedish stock market of owner groups and closed end investment funds (which have traditionally specialized in controlling large firms) declined significantly between 1998 and 2010.<sup>10</sup> Moreover, in the last few decades, several Swedish MNEs divested affiliates while investing in their core investments in Sweden. For instance, Ericsson divested its mobile phone units to Sony, at the same time expanding its investments in systems in Sweden.

We will now incorporate these features of the international market for corporate control into a model of cross-border M&As and international corporate investment.

### 3 The Model

Consider a mature market denoted  $M$  (which could be a domestic market, a regional market or a world market) where firms with different nationalities are competing. Among these firms we focus on two: firm  $h$  in country H and firm  $f$  in country F (define this set as  $I = \{h, f\}$ ). These firms are already in business in a mature market (e.g. trucks), but wish to expand their line of business into a distinct/separate emerging market,  $E$  (e.g. information technology). We define the set of markets as  $M = \{M, E\}$ .<sup>11</sup> Each firm owns existing assets used for production in the mature market, but to become active in the emerging market, they need to invest in new assets. We assume that firms exhibit a full home bias and therefore make all their new investments in their respective home countries.<sup>12</sup>

We assume the following timing of events: In the first stage, firm  $h$  (or firm  $f$ ) can buy its opponent's assets in the mature market. In the second stage, firms invest in new assets in their respective domestic market in order to be able to operate in the emerging market (and possibly also restructure their mature assets). In the third, and last, stage, firms sell their products in the markets where they are active and earn profits.

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<sup>10</sup>The so-called Wallenberg group (which includes Sweden's largest investment fund, Investor) held controlling positions in companies accounting for 42 percent of the market cap of the SSE in 1998, but this share had declined to 17.1 percent by the end of 2010. Similarly, the number of SSE-listed companies controlled by the group dropped from 14 to 7 over the same period.

Investor's Annual Report 2010 (p. 10) explicitly states "[...] we evaluate the long-term return potential of all investments. If our assessment shows that the potential of a holding does not meet our requirements, or is higher in another ownership structure, we look to exit the holding." As noted in the introduction, during this period, Investor invested heavily in growth markets. Furthermore, most of these new investments went to the Nordic region, indicating a strong home bias.

<sup>11</sup>Note that both markets may have other incumbents. We also remain agnostic regarding the degree of competition in the two markets.

<sup>12</sup>The assumption of home bias does not play any role in the basic model, but it is important when we turn to discussing government intervention.



A crucial assumption is that the firms are financially constrained and need to borrow at a *firm-specific* interest rate  $r_i$  for investment, where it will be assumed that the interest rate is increasing in the amount borrowed. We do not model the underlying mechanism for having an increasing interest rate, but motivate it with previous research dealing with asymmetric information and financial constraints.

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

### 3.1 Period three: product market interaction

It is in the last stage of the model that firms earn money by being active in product markets. The product market profits will depend on the distribution of asset ownership, given from the investment game in period 2, and the acquisition game in period 1. In each market where a firm operates, it earns revenue  $R_{im}(x_{im}, \mathbf{x}_{-im}, \kappa_{im})$  that is a function of its own output ( $x_{im}$ ), the output of all competitors ( $\mathbf{x}_{-im}$ ), and its own capital holdings ( $\kappa_{im}$ ).<sup>13</sup> We assume that both firms possess some capital in the mature market (denoted by  $\bar{\kappa}_{iM}$ ), but need to invest in order to operate in the emerging market. New investments can be financed either by drawing on available cash or by borrowing ( $B_i$ ) at a firm-specific interest rate ( $r_i$ ) that is assumed to be an increasing and convex function of how much the firm borrows. How much they need to borrow depends on the level of investments and the outcome of the first-stage acquisition game.<sup>14</sup> In order to focus on investments in the emerging market, we assume that neither firm will make any additional investments in the mature market, regardless of the outcome in the acquisition game.<sup>15</sup> Furthermore, without loss of generalization, we assume  $\lim_{\kappa_{iE} \rightarrow 0} R'_{iE, \kappa_{iE}} = \infty$ ,  $\lim_{\kappa_{iE} \rightarrow \infty} R'_{iE, \kappa_{iE}} = 1$ , and  $r_i(0) = 1$  to ensure that both firms borrow at least some cash, and to ensure that both firms invest at least some in their respective emerging market. If we let  $l = \{h, f, n\}$  be a variable indicating who acquired whose mature market ( $l = n$  indicating the scenario of no acquisition), and  $S_l$  be the cash transferred from the buyer to the seller, then  $B_i(i, S_i, \kappa_{iE}) = \kappa_{iE} - S_i$  is the amount borrowed if  $i$  is the buyer, and  $B_j(j, S_j) = \kappa_{iE} + S_j$  if  $j$  is the seller. The product market profits of the buyer and seller are then<sup>16</sup>

<sup>13</sup>We include production costs in the revenue function.

<sup>14</sup>Allowing the firms to have some initial cash holdings to use for investments or to pay for an acquisition does not change our results, so we disregard this aspect in order to save unnecessary notation.

<sup>15</sup>That is, if an acquisition occurs, the acquirer ( $i$ ) will operate with a capital stock  $\kappa_{iM} = \bar{\kappa}_{iM} + \bar{\kappa}_{jM}$  in the mature market, while the seller ( $j$ ) will have  $\kappa_{jM} = 0$  and no longer participate in the market. If no acquisition occurs, both firms operate using their initial capital level.

<sup>16</sup>For ease of exposition, we do not write out the expressions for other rivals.

$$\Pi_i(\mathbf{x}, \boldsymbol{\kappa}, i, S_i) = R_{iM}(\mathbf{x}_M, \kappa_{iM}) + R_{iE}(\mathbf{x}_E, \kappa_{iE}) - r_i(B_i(\kappa_{iE}, i, S_i))B_i(\kappa_{iE}, i, S_i) \quad (1)$$

$$\Pi_j(\mathbf{x}, \boldsymbol{\kappa}, i, S_i) = R_{jE}(\mathbf{x}_E, \kappa_{jE}) - r_j(B_j(\kappa_{jE}, i, S_i))B_j(\kappa_{jE}, i, S_i),$$

where  $\mathbf{x}$  and  $\boldsymbol{\kappa}$  are matrices containing output and capital holdings of all firms in both markets.

We may consider the action  $x_{im}$  as setting a quantity à la Cournot, or a price à la Bertrand. Letting  $\boldsymbol{\kappa}_m$  be the vector of all firms' capital holdings in market  $m$ , we assume there to exist a unique Nash-Equilibrium,  $\mathbf{x}_m^*(\boldsymbol{\kappa}_m, l)$ , defined as:

$$R_{im}(x_{im}^*, \mathbf{x}_{-im}^* : \boldsymbol{\kappa}_m, l) \geq R_{im}(x_{im}, \mathbf{x}_{-im}^* : \boldsymbol{\kappa}_m, l), \quad \forall x_{im} \in \mathbb{R}_+. \quad (2)$$

We assume this NE to exist irrespective of whether  $h$  and  $f$  compete with each other, or against other players in the markets.

From (2), we define the reduced-form profit functions for the buyer and seller as

$$\Pi_i(\boldsymbol{\kappa}, i, S_i) = R_{iM}(\mathbf{x}_M^*(\boldsymbol{\kappa}_M, i), \kappa_{iM}) + R_{iE}(\mathbf{x}_E^*(\boldsymbol{\kappa}_E), \kappa_{iE}) - r_i(B_i(\kappa_{iE}, i, S_i))B_i(\kappa_{iE}, i, S_i) \quad (3)$$

$$\Pi_j(\boldsymbol{\kappa}, i, S_i) = R_{jE}(\mathbf{x}_E^*(\boldsymbol{\kappa}_E), \kappa_{jE}) - r_j(B_j(\kappa_{jE}, i, S_i))B_j(\kappa_{jE}, i, S_i), \quad (4)$$

where  $\mathbf{x}_M^*$  depends on  $l$  (the outcome of the first-stage bargaining game) since it determines the number of firms in the mature market. Froot, Scharfstein and Stein (1993) demonstrated that this type of model can be mapped precisely into the models of Townsend (1979), and Gale and Hellwig (1985), where lenders need to incur a fixed cost to verify the state of the world. Stein (1998) shows that an appropriately parameterized version of Myers and Majluf's (1984) adverse-selection model (in which managers choose to issue equity when their private information regarding the state of the world is negative, and debt when it is positive; akin to the "lemon" problem examined by Akerlof (1970)), it leads to essentially the same reduced form for firm profits (Stein, 2003). As shown by Kaplan and Zingales (1997), investments in these types of models are weakly increasing in firm wealth, and weakly decreasing in the convexity of borrowing costs.

### 3.2 Period two: investments

In period 2, firms invest in the emerging market given the outcome of the acquisition game of the first period. This investment can be in capacity, R&D or marketing, and we assume that the revenue function ( $R_{iE}$ ) is increasing and concave in  $\kappa_{iE}$ . We make the standard assumptions that reduced-form revenues,  $R_{iE}(\boldsymbol{\kappa}_E)$ , decrease in the number of firms in the market, and that for a given number of firms in the market, the reduced-form profit  $R_{iE}(\boldsymbol{\kappa}_E)$  is decreasing in rivals' investments  $\kappa_{-iE}$  (i.e. investments are strategic substitutes).

We then assume that firms' investment decisions take place simultaneously. Formally, firm  $i$  makes its choice  $\kappa_{iE} \in \mathbb{R}_+$  to maximize the reduced-form profit,  $\Pi_i(\boldsymbol{\kappa}, l, S_l)$ . Since we are focusing on investments in the emerging market, we rewrite the function as  $\Pi_i(\boldsymbol{\kappa}_M, \kappa_{iE}, \boldsymbol{\kappa}_{-iE}, l, S_l)$ , where  $\boldsymbol{\kappa}_{-iE}$  denotes investments in new assets by  $i$ 's rivals. We assume that there are no links between the two product markets and thus, we can solve for the owners' optimal investments separately in each market. Note, however, that we need to take the owners' wealth position into account.

We assume there to exist a unique Nash-Equilibrium for investments in the emerging market,  $\boldsymbol{\kappa}_E^*(l, S)$  defined by<sup>17</sup>

$$\Pi_i(\boldsymbol{\kappa}_M, \kappa_{iE}^*, \boldsymbol{\kappa}_{-iE}^*, l, S_l) \geq \Pi_i(\boldsymbol{\kappa}_M, \kappa_{iE}, \boldsymbol{\kappa}_{-iE}^*, l, S_l) \quad \forall \kappa_{iE} \in \mathbb{R}_+, \quad (5)$$

which fulfills the following first-order condition (using Equations (3) and (4))

$$\frac{\partial R_{iE}}{\partial \kappa_{iE}} = r_i(B_i(\kappa_{iE}^*, l, S_l)) + \frac{\partial r_i}{\partial \kappa_{iE}} B_i(\kappa_{iE}^*, l, S_l), \quad (6)$$

since  $\frac{\partial B_i}{\partial \kappa_{im}} = 1$ .<sup>18</sup>

The condition in equation (6) illustrates the fact that the firm does not only have to take the cost of additional capital into account (the first term on the right-hand side), but also has to consider the effect of further borrowing on the interest rate of all borrowed capital (second term on the right).

After the investment stage, the asset ownership of a firm can then take three different shapes, one for each value of  $l$ . These are given by

$$\begin{aligned} \boldsymbol{\kappa}_i^*(i, S_i) &= (\bar{\kappa}_{iM} + \bar{\kappa}_{jM}, \kappa_{iE}^*(i, S_i)), \\ \boldsymbol{\kappa}_i^*(j, S_i) &= (0, \kappa_{iE}^*(j, S_i)), \\ \boldsymbol{\kappa}_i^*(n) &= (\bar{\kappa}_{iM}, \kappa_{iE}^*(n)). \end{aligned} \quad (7)$$

Since equilibrium investments are functions of the first-stage acquisition game, it follows that the product-market revenue and the amount borrowed also reduce to being functions of the acquisition game in equilibrium:  $R_{iE}(\boldsymbol{\kappa}_E^*(l, S_l)) \equiv R_{iE}(l, S_l)$ , and  $B_i(\kappa_{iE}^*(l, S_l), l, S_l) \equiv B_i(l, S_l)$ . This allows us to define  $\Pi_i(l, S_l) \equiv \Pi_i(\boldsymbol{\kappa}^*(l, S_l), l) \equiv \Pi_i(\mathbf{x}^*(\boldsymbol{\kappa}^*(l, S_l)), \boldsymbol{\kappa}^*(l, S_l), l)$  as a reduced-form profit function for firm  $i$  with ownership  $l$  in the mature market, encompassing the firms' optimal actions in period three,  $\mathbf{x}^*$ , and the optimal investments in new assets in period two,  $\boldsymbol{\kappa}^*$ .

### 3.3 Stage one: the acquisition bargaining game

In case of an acquisition, the foreign firm  $f$  and the domestic firm  $h$  negotiate over the price to be paid. Given the equilibria in the investment and product

<sup>17</sup>Notice that  $h$  and  $f$  may, or may not, be competitors on the emerging market.

<sup>18</sup>We have then used (2) in the form  $\frac{\partial R_{im}(x_{im}^*, \mathbf{x}_{-im}^*; \boldsymbol{\kappa}_m, l)}{\partial x_{im}} = 0$ .

market stages, we had that  $\Pi_i(l, S_l)$  is the reduced form of a firm's total profits. The surplus cannot be divided after the realization of profits in stage three; rather, any division is realized through the effect of the acquisition game on stage-three profits. That is, choosing who will acquire whom ( $l$ ) and at which price ( $S_l$ ) will determine the firms' profits in the product-market stage.

A condition for there to be a sale is that both firms benefit from it. We denote the set of bids acceptable to  $i$  as  $A_i$ , which means

$$A_i(l) = \{S_l \in \mathbb{R}_+; \Delta\Pi_i(l, S) \geq 0\}, \quad i, l = \{h, f\}, \quad (8)$$

where  $\Delta\Pi_i(l, S_l) = \Pi_i(l, S_l) - \Pi_i(n)$  for  $l = \{h, f\}$ .

If we define the lowest possible  $S$  accepted by the seller ( $j$ ) as  $\underline{S}$  and the highest price the buyer ( $i$ ) is willing to pay as  $\bar{S}$ , then we can write<sup>19</sup>

$$A_j(i) = (\underline{S}, \infty), \quad (9)$$

$$A_i(i) = (-\infty, \bar{S}). \quad (10)$$

The set of possible outcomes then becomes

$$A(i) = A_j(i) \cap A_i(i). \quad (11)$$

Thus, for  $A(i)$  to be non-empty, we must have  $\underline{S} \leq \bar{S}$ , which puts restrictions on the convexity of costs as well as the shape of the demand in the two markets. Since we are interested in the effects of a partial acquisition, we will assume this condition to be fulfilled for some  $i$  (i.e. there is at least one direction of sale that is profitable for both firms).

It is worth noting the following regarding our reduced-form profits,

$$\frac{dR_{iE}(j, S_j)}{dS_j} > 0, \frac{dr_i(j, S_j)}{dS_j} < 0 \implies \frac{d\Pi_i(j, S_j)}{dS_j} > 0, \quad (12)$$

$$\frac{dR_{iE}(i, S_i)}{dS_i} < 0, \frac{dr_i(i, S_i)}{dS_i} > 0 \implies \frac{d\Pi_i(i, S_i)}{dS_i} < 0. \quad (13)$$

$$\frac{d^2\Pi_i(j, S_j)}{dS_j^2}, \frac{d^2\Pi_i(i, S_i)}{dS_i^2} < 0. \quad (14)$$

If a firm sells (buys) assets, then the increase (decrease) in liquidity decreases (increases) the interest paid on further loans. The change in interest rates will affect the amount of investments undertaken by a firm according to equation (6), and, since it is assumed that the product market profit in the emerging market ( $R_{iE}$ ) is an increasing and strictly concave function of  $\kappa_{iE}$ , the product market profit ( $R_{iE}$ ) will be positively affected (negatively) for the seller (buyer).<sup>20</sup> The

<sup>19</sup>That is,  $\underline{S}$  and  $\bar{S}$  solve  $\Delta\Pi_i(l, S) = 0$  for  $l$  equalling  $j$  and  $i$ , respectively. These bounds are well defined and unique according to (12)-(14).

<sup>20</sup>The product market profits in the mature market are unchanged due to our simplifying assumption that no further investments are undertaken in this market.

result in equation (12) and (13) follows from this. Since there are diminishing marginal returns to investments ( $R_{iE}$  is concave), and since further borrowing increases the interest rate ( $r_i$ ) paid by a firm, both profit functions are concave in the sale price: the more the buyer needs to pay, the more lucrative investments it needs to forego, while the new investments it allows the seller to undertake will have a lower return than the previous ones.

Equations (8)-(13) define the negotiation problem: even if it is in both firms' interest to come to an agreement, they are still rivals when it comes to distributing the realized surplus from an acquisition, and it is this distribution that the firms bargain over by negotiating  $S_l$ .

The sale price is determined by Nash-bargaining with equal bargaining power, so the solution (NBS) to any bargaining game is given by the sale price

$$S_l^* = \arg \max_{S_l} [\Pi_i(l, S_l) - \Pi_i(n)] [\Pi_j(l, S_l) - \Pi_j(n)]. \quad (15)$$

However, this only gives the solution for one direction of sale, meaning that we will have two solutions from which to pick: one where  $h$  acquires  $f$ , and one where  $f$  acquires  $h$ .

## 4 Who acquires whom and why?

In this section, we begin by solving the bargaining game (determining the price and direction of an acquisition), as well as making some statements about the characteristics of buyers and sellers.

Before we can proceed with any further analysis, we must clarify the problems of who buys whom, at which price, and why. Solving the problem postulated in (15) yields the following condition:

$$\frac{\frac{\partial \Pi_j(i, S_i^*)}{\partial S}}{\Pi_j(i, S_i^*) - \Pi_j(n)} = - \frac{\frac{\partial \Pi_i(i, S_i^*)}{\partial S}}{\Pi_i(i, S_i^*) - \Pi_i(n)}. \quad (16)$$

As we will see, there is a unique solution to (16), but the outcome will differ depending on who acquires whom. From equations (12)-(14), it follows that the NBS in (16) is unique for a given ownership  $l = \{h, f\}$ , but the outcome may differ depending on who acquires whom. Determining the identity of the buyer and the seller is not possible in the standard Nash Bargaining framework since the bargaining set will then not be convex since we add two separate convex sets. Moreover, the disagreement points will not be well defined. These can either be the market structure with no merger or the market structure with the alternative merger. The theory cannot be used to determine which is appropriate.

Therefore, we make use of a cooperative endogenous ownership model developed by Horn and Persson (2001a) which compares the stability of different possible ownership structures, i.e. different ownership of the corporate assets in the two industries we study. The ownership model has three basic components: (i) a specification of the owner's possibility to move between two ownership structures determining whether one ownership structure dominates another; (ii)

a criterion for determining when the owners prefer the former structure over the latter; and (iii) a stability (solution) criterion that selects the ownership structures on basis of all pairwise dominance rankings. The basic implication of the model is that ownership structures with high aggregate industry profits tend to be the equilibrium ownership structures. The reason is that ownership structures with low aggregate industry profits tend to be unstable since some owners then have strong incentives to deviate to other possible ownership structures.

In our two-owner set up, we can use the following result from Horn and Persson (2001a):

**Lemma 1** *With two owners, the equilibrium ownership structure will be the one which give rise to the highest aggregate profits. (Horn and Persson (2001a))*

Using Lemma 1 we can state the following Lemma.

**Lemma 2** (i) *The direction of sale ( $l^*$ ) is unique, and the acquisition price ( $S_l^*$ ) is unique and determined by equation (16).*

**Proof.** In general, if the firms are not identical, the aggregate post-acquisition profit will depend on who acquires whom, i.e.  $\Pi_i(i, S_i^*) + \Pi_j(i, S_i^*) \neq \Pi_i(j, S_j^*) + \Pi_j(j, S_j^*)$ . Thus, the stability criterion will give us a unique solution. That the acquisition price is unique follows from the first-order condition in (16) and the properties of  $\Pi_i(l, S_l)$  given in (12)-(14). By (12) and (14), the left-hand side of (16) is decreasing in  $S_i$  for all  $S_i \in \mathbb{R}_+$ , while (13) and (14) imply that the opposite is true for the right-hand side. Then, the left-hand side tends to infinity and the right-hand side goes towards a positive real number when  $S_i$  approaches  $\underline{S}$ , and vice versa when  $S_i$  approaches  $\bar{S}$ . Thus, provided that the acceptance set  $A(i)$  is non-empty, equation (16) has a unique solution. ■

We can now use this Lemma to derive predictions of the identity of the acquirer. To this end, we define efficiency of ownership of an asset as how much profits an owner can generate from operating the asset. We can then state the following result:

**Proposition 3** (i) *All else equal, a firm will be the acquirer if it is a more efficient owner of assets in the mature market. (ii) All else equal, a firm is more likely to be the acquirer if it has sparse investment opportunities in the new market.*

This result follows directly from Lemma 2 and Lemma 1: if a firm becomes a more efficient owner of the mature assets (i.e. can extract more profits from its operation), the aggregate industry profit will increase if it acquires the old assets. Equivalently, if a firm's investment opportunity as a seller decreases, an acquisition by the rival becomes less profitable. Given that the magnitude of the advantage in a sector is proportional to the size of the market, then Lemma 2 and Proposition 3 are also consistent with the findings of Maksimovic and Phillips (2001) that firms with several divisions tend to focus on their core

activities when these experience positive demand shocks, and diffuse their focus under negative demand shocks.

However, it is not only the absolute efficiency of ownership that matters, but also the relative efficiency of ownership, as shown by the following proposition:

**Proposition 4** *(i) Even though one firm is a more efficient owner of assets in the mature market, it will not be the acquirer, if it is **an** even more efficient owner of new assets. (ii) Even though one firm is a more efficient owner of assets in the mature market, it will not be the acquirer, if its access to cash triggers a sufficient increase in investment in the new market.*

Proposition 4 follows directly from Lemma 2: a firm might be a more efficient owner of the mature assets (i.e. they can extract more profits from its operation) but makes a sufficiently greater use of extra liquidity so that the solution  $l^*$  that maximizes aggregate profits is the inefficient owner. For example, consider the extreme case where  $h$  can produce at a constant marginal cost  $c$  operating as a monopolist in the mature industry, while the corresponding figure for  $f$  is  $c + \varepsilon$ . Furthermore, assume that  $h$  is (for any reason) restrained from borrowing for new investments even though the management has projects they know to have a positive net present value (NPV), while  $f$  can borrow at zero interest but has no positive NPV projects. In this case, there will exist  $\varepsilon > 0$  where the total surplus from the acquisition (which would here consist of the NPV of new projects undertaken by  $h$ , and the difference between duopoly and monopoly profits in the mature sector) is such that both firms are better off with  $f$  as the acquirer, even though the running of the mature industry could be better handled by  $h$ . That both firms are better off follows from the equilibrium price being sufficiently lower when  $h$  is the seller rather than the buyer. Note that the case where  $i$  is assumed to be disadvantaged in the money market is isomorphic to the case where  $i$  has greater investment opportunities in the emerging sector; either way cash is more useful.<sup>21</sup>

It then follows that the sale might allocate financing to the owner that can use the financing in the new market more efficiently, such that the increase in profit in the new market compensates for a merger loss in the mature market. Thus, we can state the following result:

**Corollary 5** *A merger might take place, even though the combined profit of the merged entities in the mature market is lower post-transaction than the sum of the entities' profits pre-transaction in the mature market.*

This phenomenon has been found in the empirical literature; however, it has then been viewed as an indication of managers' preferences for empire building, not as a rational consequence of profit maximizing behavior. If the profits for the merged entity are lower post-transaction than pre-transaction, then the selling price must be below the value that the seller derived from the assets. This is

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<sup>21</sup>Naturally, this only refers to the problem of deciding the direction of a sale and distributing realized surpluses, not if we, for example, were to consider the effects on consumers and lenders.

possible because the seller has sufficiently good use of the cash it receives to allow it to part from its mature assets at a discount. Officer (2007) documents that firms which divest and obtain cash payments tend to be credit constrained, and that assets are typically sold at an increasing discount when external capital is more expensive for the divesting firm.

#### 4.1 Domestic investment effects of cross-border acquisitions

Let us now examine the investment effects of a cross-border acquisition. Suppose that an acquisition occurs in the mature industry where the acquiring firm shuts down production in the selling country and both firms invest new capital only in their respective domestic countries, i.e. a complete home bias. The shut-down of production in the mature industry causes a loss of jobs in the seller's country which may warrant restrictions on the acquisition, or even an outright prohibition of the merger. We first examine a prohibition of the merger.

Note that the cost of any given investment level in stage two will depend on how much a firm needs to borrow in total to invest the said amount. Since the selling firm receives cash, it can use this to finance part of its new investments. In fact, since the value of a unit of cash is 1, while the return to investment is strictly greater than 1, it will invest all cash it receives from selling its mature assets. The seller will still borrow money for investments; however, since there are decreasing marginal returns to investments, it will not borrow as much as before. The opposite holds for the buyer: any given level of investments now entails higher borrowing (since it will also have to borrow to finance  $S$ ) and thus a higher marginal cost of capital, so it reduces its investments in the emerging market.

Under the standard assumption that investments are strategic substitutes, the cost for investing in the emerging market increases for the acquirer, while it decreases for the selling firm. Thus, the selling firm can commit to a larger investment in the emerging market, whereas the acquirer will reduce its investments. It follows that given that there is a home bias for investments in the domestic market for serving the emerging market, total investments in country  $h$  can increase even if production is shut-down in the mature market after the merger, if  $\kappa_{iE}^*(j) - \kappa_{iE}^*(n) > \bar{\kappa}_{iM}$ .

**Proposition 6** *If an acquisition occurs in the mature market, (i) this increases the seller's investments in the emerging market  $\kappa_{jE}^*(i) > \kappa_{jE}^*(n)$ , while reducing the investments in the emerging market by the acquiring firm  $\kappa_{iE}^*(i) < \kappa_{iE}^*(n)$ , and (ii) the selling country may face an increased capital stock even if the production of mature products is shut down, i.e.  $\kappa_{iE}^*(j) - \kappa_{iE}^*(n) > \bar{\kappa}_{iM}$  may hold.*

**Proof.** We can rearrange (6) as  $0 = R'_{iE, \kappa_{iE}} - r_i - r'_{i, B_i} B_i$ , where the second subscript refers to the variable of differentiation, and any unnecessary notation



has been suppressed. Implicit differentiation yields

$$\begin{aligned} \frac{d\kappa_{iE}^*}{dS} &= -\frac{-r_{i,B_i}B'_{i,S_l} - r''_{i,B_iB_i}B'_{i,S_l}B_i - r'_{i,B_i}B'_{i,S_l}}{R''_{iE,\kappa_{iE}\kappa_{iE}} - r'_{i,B_i}B'_{i,\kappa_{iE}} - r''_{i,B_iB_i}B'_{i,\kappa_{iE}}B_i - r'_{i,B_i}B'_{i,\kappa_{iE}}} \\ &= \frac{(r_{i,B_i} + r''_{i,B_iB_i}B_i + r'_{i,B_i})B'_{i,S_l}}{R''_{iE,\kappa_{iE}\kappa_{iE}} - (r'_{i,B_i} + r''_{i,B_iB_i}B_i + r'_{i,B_i})B'_{i,\kappa_{iE}}}. \end{aligned}$$

The denominator is negative for both the buyer and the seller, but the sign of the nominator is determined by the sign of  $B'_{i,S_l}$ . If  $i$  is the seller ( $l = j$ ), then  $B'_{i,S_l} = -1$ , making the nominator negative and the whole expression positive. If  $i$  is the buyer ( $l = i$ ), then  $B'_{i,S_l} = 1$ , and the expression becomes negative. Note that the magnitude of the denominator is larger than that of the nominator, so  $\left|\frac{d\kappa_{iE}^*}{dS}\right| < 1$ . For (ii), it suffices to note that even though  $\kappa_{iE}$  affects profits in the emerging market, the way it does so is in conjunction with parameters regarding the demand functions. Hence, we will always be able to find parameter values for which (ii) holds true. ■

It can be worth noting that the same reasoning can be carried over to the case of employment: if the emerging sector is more labor intensive than the mature sector (which is not unlikely if we look at the current shift away from manufacturing towards services and information), then the acquisition by a foreign competitor can have *positive* net effects on domestic employment.

## 5 Merger policy and a financial efficiency defence

Let us now turn to the implications of our findings for (international) merger policy. In most countries, the market for corporate control in concentrated markets is scrutinized through merger control by an Antitrust Authority (AA). When evaluating a merger, Antitrust Authorities in most jurisdictions try to estimate whether efficiency gains are likely to offset the higher market power enjoyed by the merging firms.

The US merger guidelines, on this point, read: “[T]he merging firms must substantiate efficiency claims so that the Agency can verify by reasonable means the likelihood and magnitude of each asserted efficiency, how and when each would be achieved (and any costs of doing so), how each would enhance the merged firm’s ability and incentive to compete, and why each would be merger-specific. Efficiency claims will not be considered if they are vague or speculative or otherwise cannot be verified by reasonable means.” (US Department of Justice and US Federal Trade Commission, 1997, Section 4).<sup>22</sup>

More specifically, the US guidelines 2010 state on page 30 that “[T]he Agencies will not challenge a merger if cognizable efficiencies are of a character and

<sup>22</sup>US Merger Guidelines, revised April 8, 1997, Section 4.

magnitude such that the merger is not likely to be anticompetitive in any relevant market”, and note 14 states that “[T]he Agencies normally assess competition in each relevant market affected by a merger independently and normally will challenge the merger if it is likely to be anticompetitive in any relevant market. In some cases, however, the Agencies in their prosecutorial discretion will consider efficiencies not strictly in the relevant market, but so inextricably linked with it that a partial divestiture or other remedy could not feasibly eliminate the anticompetitive effect in the relevant market without sacrificing the efficiencies in the other market(s). Inextricably linked efficiencies are most likely to make a difference when they are great and the likely anticompetitive effect in the relevant market(s) is small so the merger is likely to benefit customers overall.”

Similarly, the following section was adopted in the 2004 European horizontal merger guidelines: “The Commission considers any substantiated efficiency claim in the overall assessment of the merger. It may decide that, as a consequence of the efficiencies that the merger brings about, there are no grounds for declaring the merger incompatible with the common market pursuant to Article 2(3) of the Merger Regulation. This will be the case when the Commission is in a position to conclude on the basis of sufficient evidence that the efficiencies generated by the merger are likely to enhance the ability and incentive of the merged entity to act pro-competitively for the benefit of consumers, thereby counteracting the adverse effects on competition which the merger might otherwise have”. (Commission of the European Communities, 2004, Paragraph 77).

The typical assumption is that these merger-specific efficiencies must be used by the buying owners. However, as shown in the above analysis, an acquisition can create merger-specific financial efficiencies that the selling owners exploit in other markets. These are investments that would not take place absent the merger, and are thus merger-specific investments (efficiencies).

To proceed, assume that the two markets, mature and emerging, are both located in the domestic country and that we have an active Antitrust Authority (AA) in the domestic country. The AA is maximizing the consumer surplus  $CS$ . Following Motta and Vasconcelos (2005), supposing that the Antitrust Authority is forward looking such that it considers whether other mergers may occur if a merger is blocked or allowed and that it accounts for the implications of such alternative mergers on the consumer surplus.

Now, consider our set-up with a competition authority that maximizes the consumer surplus in the two markets, the mature market  $CS_M$  and the emerging market  $CS_E$ . Then, we compare two policies: (i) merger policy without a financial efficiency defence and (ii) merger policy with a financial efficiency defence. We can then state the following result:

**Proposition 7** *A merger policy without a financial efficiency defence will lead to lower expected total consumer welfare in the two markets than a merger policy with a financial efficiency defence*

The proposition follows directly from the observation that being able to make

the decision contingent on more variables implies that the AA can "credibly" commit to a better policy. Since the AA can block mergers leading to worse outcomes for consumers, consumer welfare must increase due to this possibility. This occurs through two distinct mechanisms:

**Corollary 8** *From a consumer perspective, a merger policy with a financial efficiency defence can improve the merger market by allocating ownership efficiently between different markets, particularly when the risk premium is high in the economy.*

To see this, consider a merger policy without a financial efficiency defence. Then, consider a merger where the foreign firm proposes to acquire the domestic owner's firm in the mature market and that this merger creates small synergies in the merged entity such that consumer prices will increase slightly due to the proposed acquisition. The AA will then block the merger. But, if the acquisition were allowed, the domestic owner would use the acquired financial strength to expand its investments in the local emerging market to such an extent that the consumer surplus in that market would increase substantially. This follows immediately from Proposition 6 and the assumption that the consumer surplus increases in the firm capital stock, i.e.  $\frac{\partial CS_m}{\partial \kappa_{im}} > 0$ . Under the merger policy with a financial efficiency defence, the proposed acquisition will then go through and the total consumer surplus in the domestic country (i.e. the sum of the domestic consumer surplus in the two markets) will then increase even though the consumer surplus in the mature market decreases due to the market power effect.

Moreover, a proposed acquisition by the domestic owner acquiring the foreign owner's assets in the domestic market might be blocked under the merger policy with a financial efficiency defence since the ensuing expansion in the emerging market by the foreign owner will take place in the foreign market benefitting foreign consumers. This also follows immediately from Proposition 6 and the assumption that the consumer surplus increases in the firm's capital stock.

The general insight from this exercise is that a merger policy with a financial efficiency defence can improve the merger market by inducing a more efficient use of ownership skills when owners are financially constrained.

One of the main obstacles to using a merger policy with a financial looking efficiency defence is asymmetric information problems. Firms that propose to merge are privately informed about merger-specific efficiencies. This enables the firms to influence the merger control procedure by strategically revealing their information to an antitrust authority (Heidhues and Lagerlöf (2005)). However, financial efficiencies should be easier to prove since information about a firm's borrowing conditions is easier to verify.

Another issue is that the actual investment must take place after the acquisition has been approved, and it raises the concern how the merger authority can ensure that the investments actually take place. In principle, one can think about investment guarantees by the seller similar to divestitures by the buyer used in merger cases. But, in practice, this seems inefficient due to the long-time horizon and associated information problems in new investments. Thus,

the competition authority has to judge if the investment argument is rational from an ex-post perspective.

It should be noted that the need for a financial efficiency defence will be less relevant in countries and in times with well-functioning financial markets. The reason is that the potential seller could then borrow for its new investments at lower interest rates and thus has less need of cash. It then follows that in the aftermath of the financial crises, a financial efficiency defence might be of importance for the industrial restructuring process.

### 5.1 Example: The European Commission Blocks the Merger of Three and O2

While there are several studies documenting the relationship between asset divestitures and investments (e.g. Hovakimian and Titman, 2006; and Borisova and Brown, 2013), we do not observe what the divesting firms would have done in cases where the divestiture would have been blocked.

In the introduction, we mentioned the Swedish case of Investor, where the authorities blocked the divestiture of Scania to Volvo but later approved the sale to Volkswagen. In this case, it seems likely that the sale of Scania to Volkswagen generated new investments by Investor. But the potential increase in investments by Investor was not considered by the competition authorities in the Volvo-Scania case when they evaluated the proposal. A financial efficiency defence could therefore have been warranted. Another example that potentially calls for a financial efficiency defence is the blocked divestiture of Telefónica's cellphone operator O2 to Hutchinson Whampoa in 2015.

In March 2015, the large telecommunications and broadband company Telefónica announced a deal to sell the British cellphone operator O2 to Hong Kong based Hutchinson Whampoa. Hutchinson Whampoa planned to merge the O2 with its cellphone operator Three, creating the largest cellphone provider in Great Britain with around 41 percent of all subscribers.<sup>23</sup> However, the European Commission blocked the merger citing competition concerns; fearing increased consumer prices, negative effects on virtual operators (operators without their own communication networks) and less investments in the mobile network infrastructure. In the end, the European Commission blocked the deal when they found no appropriate remedies to solve the problems created by the merger.<sup>24</sup>

The defence of the deal focused on Hutchinson Whampoa which argued that the deal would benefit consumers by increasing the coverage, the network capacity and the speed and encourage (rather than discourage) investments

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<sup>23</sup> *Wall Street Journal*, March 24 2015. *Telefónica agrees to sell O2 for \$13.83 billion*. <http://www.wsj.com/articles/telefonica-agrees-to-sell-o2-for-13-84-billion-1427217528>.

*Financial Times*, January 21 2015. *Telefónica seeks O2 engagement*. <http://www.ft.com/content/3221c1cc-9fe3-11e4-aa89-00144feab7de>.

<sup>24</sup> EU Press Release, May 11 2016. [http://europa.eu/rapid/press-release\\_IP-16-1704\\_en.htm](http://europa.eu/rapid/press-release_IP-16-1704_en.htm)

in Great Britain's digital infrastructure.<sup>25</sup> However, looking at Telefónica, it seems that the deal was part of broader restructuring plans. O2 would not have been the first operation that Telefónica divested. Telefónica previously divested similar companies in both the Czech Republic and Ireland, and the sale of O2 was motivated by rivals in the United Kingdom being able to offer packages combining phone subscriptions with television and internet services, something Telefónica was not able to do.<sup>26</sup> Instead, Telefónica planned to invest further into key markets in Spain and Latin America, where they planned to offer a wider range of services, and it was expected to invest a large portion of the newly acquired funds in the German market, possibly with the intention of introducing a new type of mobile SIM card.<sup>27</sup>

Summing up, it is possible that a merger between Three and O2 could have generated an increase in consumer welfare even if competition in Great Britain had deteriorated, because Telefónica's financial position would have been strengthened. That is, it is possible that the sale would have generated sufficiently high new investments in Spain and Germany so that the total consumer surplus in the European Union would have increased.

## 5.2 Employment and investment guarantees

In practice, some governments do not only use competition law to affect outcomes in the merger market, but also use different types of industrial policies. Indeed, governments sometimes use employment and investment guarantees when foreign firms invest. Proposition 6 hints at a policy which would put restrictions on shutting down the selling firm's plant in the mature industry, which might be preferred to blocking the merger. This would preserve jobs in the mature industry while, at the same time, ensuring a transition to the emerging industry. However, such restrictions will reduce the acquisition price which will, in turn, affect the level of new investments in the emerging market.

To see this, let  $\phi$  be a restriction measuring how much of the sold assets,  $\bar{K}_{iM}$ , that have to be used after the acquisition. It is reasonable to assume that such restrictions will reduce the efficiency of the industry so that profits in the mature industry are decreasing in  $\phi$ . This implies that the gains from an acquisition in the mature industry, which we denote  $\Delta\Pi_M(l, \phi)$ ,<sup>28</sup> are also decreasing in  $\phi$ . However, if the gains from the acquisition are affected, so is the sales price  $S_l^*$ . This does, in turn, imply that investments in stage 2 will

<sup>25</sup>BBC, May 11 2016. *EU blocks Three's takeover of O2*. <http://www.bbc.com/news/business-36266924>.

<sup>26</sup>*Wall Street Journal*, March 24 2015. *Telefónica Agrees to Sell O2 for \$13.83 billion*. <http://www.wsj.com/articles/telefonica-agrees-to-sell-o2-for-13-84-billion-1427217528>.

<sup>27</sup>*Financial Times*, February 25 2015. *Telefónica promises sharper focus will bring return to growth*. <https://www.ft.com/content/6ac49a4e-bcc2-11e4-a917-00144feab7de>.

The Corner, March 27 2015. *Telefónica to focus attention on German market after O2 UK sale*. <http://thecorner.eu/companies/telefonica-focus-attention-german-market-o2-uk-sale/44791/>.

<sup>28</sup>Formally we have  $\Delta\Pi_M(l, \phi) = R_{iM}(l) - R_{iM}(n)$  since neither firm is assumed to make any further investments in the mature market.

be affected since the capital costs will be affected (Proposition 6). Thus, there is a spillover from the profitability of the merger in the mature industry to the profitability in the emerging industry through capital costs affecting firms' investments in the emerging market.

Rewriting (16) and defining this as a function  $\Lambda(l, S_l^*(\phi), \phi) = 0$ , we can use the implicit function theorem to arrive at the following lemma:

**Lemma 9** *The sale price is strictly decreasing in the degree of government restriction.*

**Proof.** According to the implicit function theorem  $\frac{dS_l^*}{d\phi} = -\frac{\Lambda'_\phi}{\Lambda'_{S_l}}$ , where the subscripts refer to the derivative. Then, using the Nash bargaining solution given in equation (16), we see that

$$\frac{dS_l^*}{d\phi} < 0 \text{ if } \Pi''_{i,S_l S_l} \Delta \Pi_j + \Pi''_{j,S_l S_l} \Delta \Pi_i < -2\Pi'_{j,S_l} \Pi'_{i,S_l}$$

which must always be true since the profits are increasing and concave in liquidity, and since  $S_l \in A(l)$  is a prerequisite for an agreement. ■

Then, since a reduction in the sales price reduces the liquidity of the seller, we have:

$$\frac{d\kappa_{iE}^*}{d\phi} = \frac{d\kappa_{iE}^*}{dS_j^*} \frac{dS_j^*}{d\phi} < 0. \quad (17)$$

Thus, restrictions that the selling country places on the merger in the mature industry will reduce the amount of investments it receives in the emerging market if the marginal use of cash is diminishing in the amount held. The effect of this depends on how large a share firm  $h$  invests in its domestic market. If the home bias for this investment is very large, then restrictions may potentially reduce the capital stock in the selling country. The opposite holds for the domestic country of the acquirer. Thus, we have derived the following result:

**Proposition 10** *Restrictions on cross-border acquisition in the mature market may reduce the total assets in the selling country since restrictions reduce new investments in the emerging industry.*

This result is straightforward: since restrictions on the utilization of capital reduce the acquisition price (Lemma 9), it will be more expensive for the seller to invest as compared to the case with no restrictions, and, following the same reasoning as in the proof of Proposition 6, it is feasible that the capital stock will be reduced as a direct consequence.

## 6 Concluding remarks

The fact that most investors have a home bias seems to indicate that countries should block foreign acquisitions to protect domestic production and investments. In this paper, we show that this is not necessarily the case when a partial

asset sale takes place or in a “non-US corporate governance system” with active owner groups. The reason is that when foreign acquisitions are allowed, domestic owners improve their financial strength and thereby increase their other corporate investments. Then, due to their home bias, they will likely invest in new ventures in the domestic country. Moreover, the foreign owner becomes “locked in” in industry specific-capital in the domestic market when acquiring, and will invest less in new ventures. This might, in turn, create a strategic advantage in the growth market for the seller. Indeed, this finding calls for a financial efficiency defence in the merger law, in order to allow financially constrained owners to create a consumer surplus in emerging markets.

In the previous literature, cross-border acquisitions have been shown to be driven by access to low production costs, access to markets, synergies and market power. We here identify another important factor: the seller’s need for financial resources to be able to invest in new growth markets. Indeed, we show that the possibility of undertaking new investments can imply that countries (not only firms) can benefit from being sellers rather than buyers in cross-border acquisitions.

An interesting avenue for future work is to empirically test how corporate asset sales affect subsequent corporate investments decisions. Studies of demonstrating the correlation between asset sales and subsequent corporate investments, such as Hovakimian and Titman (2006) and Warusawitharana (2008), are an excellent start but more work on how corporate asset sales by MNEs and Owner groups affect subsequent investment, location and employment decisions in international markets would be welcome.

On a final note, there are some countries that have a Foreign Investment Review Board (FIRB) that approves acquisitions (mergers) with an explicit provision for political input.<sup>29</sup> There are often other domestic firms in these markets (ignored in our model) that generate the political reaction. A domestic seller might in such cases call upon a financial efficiency defence, arguing that the proceeds of the sale will be used to invest in other markets in the home country. Investigating such interactions seems an interesting avenue for future research.

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<sup>29</sup>One such example is the Australian Foreign Investment Review Board (FIRB). (FIRB annual report 2014/2015, p.9). Australia’s foreign investment review framework is designed to balance the need for foreign investment against the protection of the national interest. (Australia’s foreign investment policy 2016-2017, p.8).

A case reviewed by the FIRB in 2013 that received quite some public attention and concern was the proposed acquisition of the publicly listed company GrainCorp by the US-based multinational Archer Daniels Midland (ADM). (The Guardian (29 November 2013)). ADM stated that the company intended to make a cash offer for the entire outstanding GrainCorp common shares. ADM hoped that the acquisition would lead to a strong positive development for both companies and provide the possibility of accessing fast-growing markets in the Middle East, Africa and Asia. (ADM press release)

On November 29, the Treasurer Joe Hockey held a media conference in Sydney regarding the much debated sale. At the conference, Hockey stated that “I had to determine that the acquisition of GrainCorp by ADM is contrary to the national interest and, based on all the information available, I have now made that decision”.

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