

International Restructuring: Cross-border Buyouts and Acquisitions.*

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Abstract

Motivated by the increase in cross-border private equity (PE) buyouts we propose a model of cross-border acquisitions and buyouts where multinational enterprises (MNEs) exploit firm-specific assets and retained earnings whereas PE exploits restructuring skills. Lower risk premium and better financial market development increases the PE-buyout share by reducing MNEs' incumbent advantage, while increases in intellectual property rights protection decreases the share through higher MNE acquisition synergies. A reduction in interest rates does not increase the share of PE-buyouts, since MNEs' opportunity cost of using retained earnings for the investment then decreases as well. Restricting PE-buyouts can be counterproductive for welfare in particular when the risk premium is high.

Keywords: International Restructuring, Ownership Efficiency, Private Equity, Buyouts, M&As.

JEL classification: G30, F20, L10, L20

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1 Introduction

It is well established that cross-border mergers and acquisitions play a key role in the global industrial development and restructuring process. It is, however, less known that a full 8.2% of all cross-border mergers and acquisitions that took place during 1998-2010 were cross-border buyouts undertaken by private equity (PE) firms. These cross-border buyouts are orchestrated by PE firms who—in competition with established MNE—acquire, restructure and sell firms. There is substantial variation in the share of cross-border mergers and acquisitions that are buyouts over time, across industries and across countries: the share across time varies between 5% and 12% (see Figure 5), the mean share 1998-2010 across industries between 0% and 45% (see Figure 6), while the mean share 1998-2010 across countries vary between 0% and 19.5% (see Figure 7).

Despite a burgeoning literature on cross-border mergers, there is to our knowledge no work on the determinants and effects of cross-border buyouts and their interaction with cross-border mergers and acquisitions. What determines if a cross-border buyout occur in a given country? What are the welfare effects of cross-border buyouts?

To answer these questions we develop a theory of cross-border acquisitions and cross-border buyouts. The starting point of the paper is that multinational firms and private equity firms differ in the following two fundamental respects: (i) *multinational firms have a business firm-specific advantage*: they have accumulated high quality firm specific assets for competing in the global market place, i.e. management skills, production facilities, intellectual property and retained earnings; (ii) *private equity firms have a restructuring advantage*: they are temporary owners of target firms and have accumulated restructuring skills, i.e. skills in affiliate acquisitions and divestitures, financial and governance skills during acquisitions restructuring.

Using this distinction between MNEs and PEs we propose the following model: initially there is a domestic product market served by several foreign MNEs. There is also a domestic firm which is put up for sale. The domestic firm could be acquired either by one of the foreign MNEs or, alternatively, by one of several competing foreign private equity firms. Prior to bidding for the domestic firm, MNEs and private equity firms may seek financing from outside investors to finance the acquisition. Post-acquisition, product market competition takes place between the firms with assets in the market, repayments to outside investors are made, and finally—if a PE buyout took place—the private equity firm make an initial public offering and thereby exit its investment, where a large number domestic citizens are the acquirers.

We first establish that the incidence of PE buyouts is unaffected by general financial market conditions, as measured by the interest rates. At first glance, this result is surprising. However, with well functioning capital markets the cost of access to capital from outside investors to finance the acquisition also determines the opportunity cost of

retained earnings. When general financial market conditions deteriorate and make access to external financing more costly, the opportunity cost of using retained earnings for the acquisition also increases. This implies that the foreign MNE firms remain indifferent to using retained earnings or external financing to finance the acquisition. Acquisition prices, though, drop both in an acquisition and in a buyout. However, we also establish that a PE buyout becomes more likely when the risk premium associated with lending decreases. In effect, since an MNE can finance part of an acquisition with retained earnings instead of going to outside investors, MNEs have an advantage over private equity firms when the risk premium is high. This financial advantage decreases with a declining risk premium. This prediction is consistent with data as demonstrated in Figure 5. In periods of relatively higher risk leading up to both recessions, we see a decline in the LBO share, and the period after the 2001 recession recession enjoys an increase in the share.¹

We also show that buyouts by private equity firms become more likely when the financial market in host country becomes more developed as exit costs then will be lower in that economy, which feeds back to incentive to outbid MNEs in the acquisition auction for the target firm.

Lastly, we show that weak intellectual property rights protection makes cross-border buyouts more likely since MNEs are then less willing to transfer firm-specific assets due to fear of expropriation by rivals. This weakens incentives for foreign MNE firms to acquire the domestic target while it does not affect private equity firms' incentives since they lack firm specific assets.

Our model also allows us to explore the policy dimension. In the policy debate there has been a concern that private equity buyouts, in particular buyouts by foreign private equity firms, are driven by short run gains resulting in long run inefficiencies.² Policy responses range from attempts to ensure tax neutrality and transparency, to a more direct intervention in capital structure, competition policy, and corporate governance (Walker (2007); PSE (2007)). For example, several countries have already taken some steps to reduce the deductibility of interest payments and goodwill: Denmark has passed a law that limits deductions and Germany has enacted a law limiting the deductibility of net interest expenses to below 30% of EBITA, which is similar to laws adopted in Italy (Thomsen (2009)).

Performing a welfare analysis on the effects of restricting foreign private equity buyouts, we underscore that restricting buyouts can be counterproductive since private equity

¹We do not observe an increase after the second recession since this recession was triggered by a financial crisis which had long lasting effects on financial parameters such as the risk factor, and affected the borrowing capacity of LBOs whereas M&As still could tap into their retained earnings.

²See, for instance, "Testing the Model: Private Equity Faces a More Hostile World" (Jul 9 2009, *The Economist*), "Editorial, New Rules for Private Equity" (August 30 2009, *New York Times*) or "Private Equity Fights Tax Plan" (February 27 2009, *Financial Times*).

buyouts subsequently followed by a subsequent IPO may prevent a concentration of the market. In particular, we show that the probability of a welfare reducing outcome is higher in times when the risk premium in the economy is high, which would put MNEs at a comparative advantage over PEs due to their retained earnings.

Our paper is a contribution to the recent theoretical literature on international mergers and acquisitions in oligopolistic markets which, in contrast to the traditional foreign direct investment literature, emphasizes that greenfield investments and cross-border acquisitions are not perfect substitutes (see, for instance, Blonigen (1997), Bjorvatn (2004), Bertrand and Zitouna (2006), Head and Ries (2006), Mattoo et al. (2004), Norbäck and Persson (2008) or Raff et al. (2006)). There is also a small theoretical literature addressing welfare aspects of cross-border mergers in international oligopoly markets. This literature includes papers by, for example, Falvey (1998), Head and Ries (1997), Horn and Persson (2001), Lommerud et al. (2006), Neary (2007) and Norbäck and Persson (2007). Our contribution is to propose a model of cross-border acquisitions and buyouts where multinational enterprises (MNEs) exploit firm specific ‘business as usual’ assets and retained earnings whereas PE exploits restructuring skills. We then exploit this model to examine how financial market and property right characteristics affect the MNE acquisition- PE buyout pattern and the corresponding welfare effects.

The paper is also related to the literature on industrial reorganization in the financial literature, which shows that M&A activity can be triggered by changes in owner productivity and cost of new capital, where more productive owners buy assets from less productive owners. (See Jovanovic and Rousseau (2002) and Maksimovic and Phillips (2002). We add by showing that financial conditions may affect the type of mergers (MNE acquisition or PE buyout) and how the efficiencies in these acquisitions are affected.

The rest of the paper is organized as follows. Next up we develop our formal model of cross-border acquisitions and cross-border buyouts. In Section 3, we perform comparative statics to derive our main propositions regarding the effect of financial market conditions, financial market development and intellectual property rights protections on the cross-border buyout share. Section 5 discusses the welfare effects of banning cross-border buyouts, and we offer some concluding remarks in Section 6.

2 A model of cross-border acquisitions and buyouts

2.1 The Private equity business model

We start out with a brief primer on the private equity business model. Private equity buyouts, or leveraged buyouts, are acquisitions of established companies with stable cash flows, usually with the help of substantial amounts of leverage. These acquisitions are

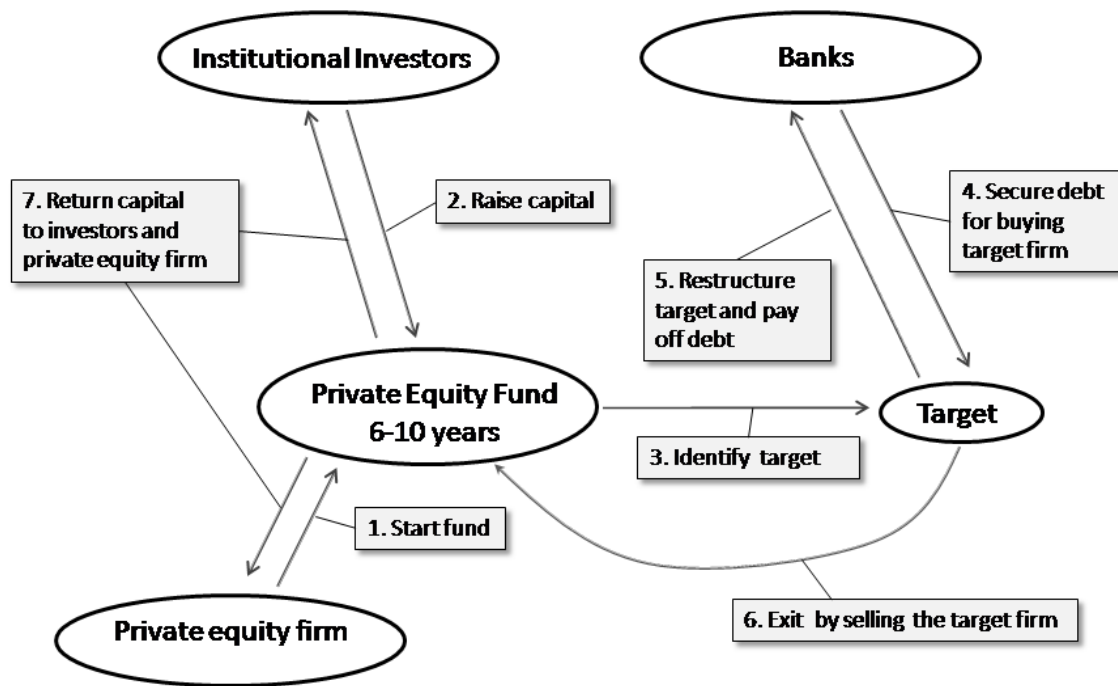


Figure 1: The private equity business model. (1) Private equity firms set up a private equity fund with a predetermined life span. (2) The general partners raise capital from institutional investors. (3) Private equity firms start looking for target firms to acquire. (4) When a target is identified, debt is raised from banks to finance the acquisition. (5) The target firm is restructured and the cash flows from the firm are used to pay off part of the debt. (6) After the firm has been restructured, the private equity firm sells the target firm. (7) The proceeds from the sale are returned to investors and the private equity firm.

sponsored by private equity firms (often organized as partnerships) that raise money from institutional or private investors, for private equity funds with a predetermined life span.

The private equity business model works as follows (see Figure 1 for an illustration):

1. The partners (a group of entrepreneurs or managers) with restructuring skills and a business idea set up a private equity firm and an associated fund with a predetermined life span.
2. The partners in the private equity firm go out and raise capital from institutional investors such as pension funds, and wealthy individuals.
3. After the target amount of capital has been raised, the fund is closed and the private equity partners start looking for firms to acquire and restructure.
4. Once a firm has been identified, debt is raised from banks in order to finance the acquisition. Private equity firms usually acquire multiple firms in each fund, and each acquisition is financed with 60%-90% debt.

5. The target firm is acquired and restructured. Cash flows from the firm are used to pay off part of the debt.
6. After the firm has been restructured, the private equity firm sells the firm it acquired.
7. The returns from cash flow during the restructuring period and from the sale of the firms in the fund are split on a 80/20 basis with 80% going back to the investors in the private equity fund and 20% going to the private equity firm.

This business model gives private equity firms advantages in the restructuring process.

- (i) Private equity backed firms have more concentrated ownership than publicly traded firms, which implies that the private equity firms have stronger grounds to be run more efficiently. In fact, Jensen (1986) Jensen (1986) states that one way of increasing efficiency is to reduce agency problems in the firm by increasing leverage which leads to a reduction of the free cash flow available to managers.
- (ii) Private equity firms are temporary owners of the target firm, and therefore have stronger incentives to both restructure target firms and to take on debt to give management incentives to undertake restructuring activities (Norbäck et al. (2010)).
- (iii) Private equity backed firms are not listed on a stock exchange and therefore can have an advantage over publicly traded firms due to less stringent reporting requirements. Publicly traded firms are subject to tighter bookkeeping, accounting and reporting standards which imposes a restriction on the time and effort management spends on productivity enhancing exercises.

The private equity buyout industry took off during the 1980s. As a large wave of takeovers swept across the U.S., leveraged buyouts became a much talked about and scrutinized new phenomenon. When the takeover wave receded at the end of the 1980s, so did a large part of leveraged buyout activities. They did not, however, vanish completely but instead spread from the U.S. to other countries. Towards the end of the 1990s and during the first decade of the 21st century, the private equity buyout industry once more emerged and this time on a global scale and with full force. Strömberg (2008) estimates that between 1970 and 2007, the total value of all firms subject to a buyout (worldwide) was \$3.6 trillion in 2007 U.S. dollars. At the end of 2007, around 14 000 operating companies worldwide were owned by private equity funds.

2.2 The MNE business model

MNE are firms with firm specific assets such as patents, know-how, and brand image that they exploit internationally. They are often large in size, profitable and organized as

limited liability companies, and listed on the stockmarket. An MNE can expand internationally either through greenfield investments (setting up new plant) or by acquiring firms in host countries.

The MNE model works as follows :

1. The owner group (a group of entrepreneurs or managers) with a business idea set up limited liability firm and seek debt finance in the domestic stock market.
2. Due to proficient management and the creation of high quality firm specific assets such as patents and know-how, they become large in size and very profitable.
3. The firm then exploits its firm and industry specific assets and retained earnings internationally, by exporting and/or undertaking foreign direct investment (FDI). They can also engage in greenfield investments or cross border acquisitions at this stage.
4. This process then continues and shareholders benefit from increased stock market value and dividends.

Throughout the paper, we will focus on three differences between multinational firms and private equity firms which we believe are crucial to explain the difference in their behavior: (i) multinational firms are current "insiders" in an industry in the sense that they already have industry specific knowledge and firm specific assets in the global marketplace. These assets take the form of production facilities, intellectual property and retained earnings³, (ii) private equity firms, on the other hand, are "outsiders" that lack industry specific assets/knowledge but have firm specific knowledge in restructuring; and (iii) private equity firms resell their holdings and thus they incur costs related to reselling the assets.

The timing of the game is the following:

1. *Financial contracting.* Multinational firms and private equity firms write contracts with external investors to obtain promise of financing in stage 2 in case of winning the auction for the target. Repayments are made at the end of stage 3.

³Faccio and Masulis (2005) sample contains 2,942 (80%) pure cash deals, 416 (8.4%) mix of cash and stock deals and 309 (11.3%) pure stock deals. In contrast, Andrade, Mitchell and Stafford (2001) report that 70% of M&A transactions by US firms in the 1990s involve stock financing, with 58% entirely stock financed.

Eckbo and Langohr (1989) report in a study of 306 tender offers for publicly traded French targets that over the period 1966-1982, 25% were at least partially stock financed. Franks, Harris and Mayer (1988) who report that during 1955-85, 66% of UK M&A deals included at least some stock in its method of payment. Zhang (2003) reports that 63% of M&A deals completed over 1990-99 where bidder and target are London Stock Exchange listed include at least some stock payment.

2. *The acquisition auction.* A foreign target firm is up for sale through a first price perfect information auction with externalities (Jehiel and Moldovanu (1999); Jehiel et al. (1999); Jehiel and Moldovanu (2000)). Externalities mean that the value of winning for a bidder is determined *relative to* what happens if the bidder loses the auction. The bidders in this auction are the multinational firms (the MNE) and private equity firms (undertaking LBOs). Depending on valuations for winning the auction, either an MNE or a private equity firm obtains the target, or the target remains unsold.
3. *Product market competition.* Firms that have assets for producing compete in the product market. If the target remains unsold or was acquired by a private equity firm, there are $n + 1$ firms on the market. Alternatively, if an MNE acquired the target there are only n firms competing on the market. If the private equity firm acquired the target in period 2 it will exit by a sale to an independent outside investor. After product market actions have been set and profits realized, repayments to outside investors are made, eventual costs of reselling the assets are incurred, and the game ends.

We solve the game by backwards induction, starting with the product market competition stage.

2.3 Stage 3: Product market competition

In the first stage in period 3 the private equity firm will exit on its investment if it acquired the target it in period 2 by a sale to independent outside investors at an exit cost E_p . As a simplifying assumption we do not allow the target firm to be run by the private equity owner. Additionally the target firm owned by the private equity firm is referred to as the private equity firm while undergoing restructuring until its sale back into the market. The MNE's profits when owning the target refer to the profits of the entire MNE operation including the target, and the profits without refer to the alternative where the MNE exists as is.

The set of potentially producing firms in the industry is $\mathcal{J} = \{i_1, i_2, \dots, i_n, p_1, p_2, \dots, p_m\}$, where $j \in \mathcal{J}$ is an element. The first n entries refer to the n number of MNEs (i) and the final m entries to the m number of private equity firms (p). The set of (potential) owners of the target firm's assets is $\mathcal{L} = \mathcal{J}$, where $l \in \mathcal{L}$ is an element. Let $\pi_j(\mathbf{x}, l)$ denote the product market profit of firm j . The vector of actions taken by firms in product market interaction is x . Only firms that have assets for producing compete in the product market, hence if the target was acquired by a private equity firm, there are $n + 1$ firms on the market whereas if an MNE acquired the target there are n firms on the market.

Given l , firm j chooses an action x_j to maximize its product market profits anticipating

the repayments to outside investors: $\pi_j(x_j, x_{-j} : l) - R_l - E_l - F_l$ where x_{-j} is the set of actions taken by j 's rivals, R_l refers to payments to outside investors and E_l are exit costs incurred by private equity firms such that $E_i = 0$ and $E_p = E$ if firm $j = l$ is the acquirer. F_l is a fixed restructuring cost only relevant for the acquirer ($F_l > 0$ if $l = j$ and $F_l = 0$ for $l \neq j$). Assume a unique Nash-Equilibrium exists, $\mathbf{x}^*(l) = (x_j^*(l), x_{-j}^*(l))$, defined as

$$\pi_j(x_j^*, x_{-j}^* : l) - R_l - E_l - F_l \geq \pi_j(x_j, x_{-j}^* : l) - R_l - E_l - F_l, \quad \forall x_j \in R^+. \quad (1)$$

Since product market actions do not affect repayments of what was previously borrowed, and fixed restructuring cost do not affect product market actions, we can define a reduced-form product market profit for a firm j , taking as given the ownership l of the target firm's assets, as $\pi_j(l) \equiv \pi_j(x_j^*(l), x_{-j}^*(l), l)$. Thus, we have that $\pi_A(i)$ is the profit for an MNE acquirer ($l = i$) and $\pi_P(p)$ is the profit for a private equity firm in case an LBO takes place ($l = p$). Non-acquiring MNEs' profits are $\pi_{NA}(l)$ where $l = \{p, i\}$ is the type of owner of the target firm.

The potential owners of the target firm differ in terms of how efficient they are at utilizing its assets, denoted by an ownership efficiency parameter $\gamma \in [0, \gamma^{\max}]$ for $\gamma^{\max} > 1$. This parameter captures synergies between the assets of the multinational firm and the target and it captures the extent to which private equity firms are able to restructure the target firm to improve profitability. We allow the ownership efficiency parameter to vary between MNEs and private equity firms, but normalize it to unity for private equity firms. Hence, $\gamma > 1$ says that a multinational firm would be able to make better use of the target's assets than a private equity firm, whereas if $\gamma < 1$ an MNE is less efficient than an a private equity firm.

The ownership efficiency parameter will affect the profits of MNEs and rival MNEs in the following way:

Assumption 1 $\frac{d\pi_A(i)}{d\gamma} > 0$ and $\frac{d\pi_{NA}(i)}{d\gamma} < 0$.

Assumption 1 is compatible with oligopoly models of competition (Farrell and Shapiro (1990)) including the Cournot model where γ reduces the marginal costs for the acquirer.

4

⁴Example (The Linear Quadratic Cournot Model): Let demand be linear, $P = a - \frac{Q}{s}$, where a indicates consumer willingness to pay and s denotes market size. Direct product market profits are $\Pi_h = (P - c_h)q_h$, where q_h is output for a firm of type $h = \{A, NA\}$. The marginal cost of an acquirer is $c_A = c - \gamma k$ and the non-acquirer has the marginal cost $c_{NA} = c$. k captures the quality of the initial assets. Reduced-form profits then take the form $\pi_h(l) = \frac{1}{s} (q_h^*)^2$, where $q_A^*(i) = \frac{a-c+n\gamma k}{n+1}$, $q_{NA}^*(i) = \frac{a-c-\gamma k}{n+1}$. Hence, $\frac{d\pi_A(i)}{d\gamma} > 0$, and $\frac{d\pi_{NA}(i)}{d\gamma} < 0$.

2.4 Stage 2: Acquisition auction

In this stage we determine the ownership and the acquisition price of the target's assets. The acquisition process is depicted as an auction where all MNEs and private equity firms simultaneously post bids. Everyone announces a bid, b_i , which is either accepted or rejected by the target's owner. Following the announcement of bids, the target's assets are sold at the highest bid price. The acquisition is solved for Nash equilibria in undominated pure strategies. We allow MNEs with retained earnings A to access financial markets to earn interest rate r between stage 2 and stage 3 if they do not use the retained earnings to (partly) pay for the target's assets.

Moreover, each MNE and private equity is offered a borrowing contract in period 1 specifying a repayment $R_i^*(I)$ in period 3 when borrowing an amount I_l in period 2 if acquiring up to the maximum amount $R_i^{\max}(I_l^{\max})$.

To solve the acquisition auction and determine bids, we need to determine the valuations of the bidders for obtaining the assets and the target owner's reservation price for selling them. To aid in this, we introduce the net gain function $N_l(S)$ which defines the net gain for a bidder/seller of type l if the acquisition price is S and that the acquirer borrow only the minimum amount needed to be able to pay the acquisition price defined as $I_l^{\min}(S, A)$ and the associated repayment $R_i^*(I_l^{\min}(S, A))$. As noted above the MNE will face a fixed restructuring cost of F_i when restructuring the target firm.

An MNE will have two net gain functions for $l \in \{i, p\}$ defined as:

$$N_{il}(S) = \underbrace{[\pi_A(i) - S] + [I_i^{\min}(S, A) - R_i^*(I_i^{\min}(S, A))]}_{\text{Acquire}} + A - F_i - \underbrace{[\pi_{NA}(l) + (1+r)A]}_{\text{Do not acquire}}. \quad (2)$$

An MNE's maximum willingness to pay for the target depends on what happens if another MNE obtains the target ($l = i$) or if a private equity firm obtains the target ($l = p$) differently since the two types differ in synergies γ . Note also that the acquirer may eventually need to use a borrowing promise made by an investor in period 1, which will depend on the price it will pay. The maximum willingness to pay, v_{il} , can be determined as $v_{il} = \min S, s.t. N_{il}(S) \geq 0$. Solving for $N_{il}(S) = 0$, we get the maximum willingness to pay for each of the two net gain functions as

$$v_{il} = \pi_A(i) - F_i - \underbrace{[R_i^*(I_i^{\min}(v_{il}, A)) - I_i^{\min}(v_{il}, A)]}_{\text{Cost of borrowing}} - \pi_{NA}(l) - \underbrace{rA}_{\text{Opportunity cost of retained earnings}} \quad (3)$$

Using the same argument, we see that the net gain for a private equity firm of acquiring

the assets equals

$$N_p(S) = \underbrace{[\pi_p(p) - E] - S - [R_p^*(I_p^{\min}(S)) - I_p^{\min}(S)] - F_p}_{\text{Invest}} - \underbrace{0}_{\text{Do not invest}}. \quad (4)$$

which gives a maximum willingness to pay equal to

$$v_p = \pi_P(p) - F_p - E - \underbrace{[R_p^*(I_p^{\min}(v_p)) - I_p^{\min}(v_p)]}_{\text{Cost of borrowing}} \quad (5)$$

Given the valuations v_{il} and v_p , defined in equations (3) and (5), we can now solve the auction for the target's assets and determine the equilibrium ownership structure and the acquisition price. These valuations can be ranked in six ways and the auction solved by considering each ranking in turn.

Lemma 1 *The equilibrium ownership of the target and the acquisition price S^* in stage one is given in Table 1.*

Inequality	Definition	Winning type	Acquisition price, S^*
$I1$	$v_{ii} > v_{ip} > v_p$	i	v_{ii}
$I2$	$v_{ii} > v_p > v_{ip}$	i (or p)	v_{ii} (or v_p)
$I3$	$v_{ip} > v_{ii} > v_p$	i	v_{ii}
$I4$	$v_{ip} > v_p > v_{ii}$	i	v_p
$I5$	$v_p > v_{ii} > v_{ip}$	p	v_p
$I6$	$v_p > v_{ip} > v_{ii}$	p	v_p

Table 1: This table describes the equilibrium ownership type (k or s) and the acquisition price S^1 for each possible ranking of the valuations v .

Proof. See the Appendix. ■

Two types of ownership structures arise in equilibrium: A private equity buyout takes place under $I5$ or $I6$, while under $I1 - I4$ an MNE acquires the target firm. For $I5 - I6$, an LBO takes place since private equity firm's valuations exceed MNEs valuations and the acquisition price is $S^* = v_p$. For $I4$, a concentrating acquisition takes place at price $S^* = v_p$. One MNE finds it profitable to bid slightly above the private equity firms in order to reduce the number of firms on the market. For $I1 - I3$ a preemptive acquisition takes place. MNEs bid against each other in fear of being forced to compete with an MNE that acquired the target and obtained efficiency gains from synergies. The acquisition price is bid all the way up to $S^* = v_{ii}$. For $I2$, there can potentially be two equilibria. In the first, MNEs do not expect other MNEs to outbid the private equity firms so a private equity buyout takes place. In the second, MNEs expect other MNEs to bid for the target and a preemptive acquisition takes place. For simplicity, we will focus on the second equilibrium (a preemptive acquisition occurs).

Moreover, the equilibrium borrowing $I_l^*(S^*, A)$ and repayment $R_l^*(I_l^*(S^*, A))$ are also determined through S^* .

2.5 Stage 1: Financial contracting

In this stage each MNE and private equity firm is offered a borrowing contract specifying a repayment $R_l(I_l)$ in period 3 when borrowing an amount I_l in period 2 if acquiring the target firm, up to the maximum amount $R_l^{\max}(I_l^{\max})$. Note that funding is conditional on making an acquisition, and we assume perfect information and bidding competition among symmetric investors implying that all investors break even. Consequently, each MNE and private equity is promised a borrowing contract in equilibrium specifying a repayment $R_l^*(I_l)$ in period 3 when borrowing an amount I_l^* in period 2 if acquiring up to the maximum amount $R_l^{*\max}(I_l^{*\max})$.

Since acquiring firms typically are associated with an idiosyncratic risk the investor will require a risk premium, labeled ρ , to lend money to the acquirer but this risk will not be present in the deposit (lending) rate r which is not subject to this kind of risks. The risk premium will account for a comprehensive credit risk that includes but is not limited to the risk of loan restructuring, moratorium, and other changes in the payment plan which are more common among PE types than the MNE. Thus, it would make sense to introduce differences in the credit risk of both types of borrowers. However, to simplify, we here assume it to be the same for MNEs and private equity firms. We relax this assumption in Section 4.2.1.

Then, it follows that the investor will require an interest rate of $r + \rho$ to lend in equilibrium. At a lower interest rate the investor will prefer putting their money in the risk free investment to get r , and at higher interest rates fluctuations in demand from investors will lower the interest to the stated equilibrium. This implies that $R_l^* = (1 + r + \rho)I_l$.

Let us now determine $R_l^{*\max}(I_l^{*\max})$. For the private equity firms we know that the maximum payoff in period three is $\pi_P(p) - F_p - E$. Thus $R_p^{*\max} = \pi_P(p) - F_p - E$ and $I_p^{*\max} = (1 + r + \rho)^{-1}(\pi_P(p) - F_p - E)$. For an MNE, we know that their maximum repayment in period three is $\pi_A(i) - F_i$. Thus $R_i^{*\max} = \pi_A(i) - F_i$ and $I_i^{*\max} = (1 + r + \rho)^{-1}(\pi_A(i) - F_i)$.

We can thus state the following proposition:

Proposition 1 *In the borrowing equilibrium, we have that (i) private equity will have a loan guarantee of $I_p^{*\max} = (1 + r + \rho)^{-1}(\pi_P(p) - F_p - E)$ with a associated repayment of $R_p^{*\max} = \pi_P(p) - F_p - E$ and (ii) an MNE will have a loan guarantee of $I_i^{*\max} = (1 + r + \rho)^{-1}(\pi_A(i) - F_i)$ with a associated repayment of $R_i^{*\max} = \pi_A(i) - F_i$*

3 The equilibrium cross-border acquisition and buy-out pattern and level of synergies

Let us now turn to examine how the equilibrium acquisition and buyout pattern depend on synergies. To this end we need to derive the maximum willingness to pay given optimal behavior in the financial market. To this end we simply use that $R_i^* = (1 + r + \rho)I_i$ and $I^{\min} = S - A$ in equation (2), where for $l \in \{i, p\}$:

$$N_{il}(S) = \underbrace{[\pi_A(i) - F_i - S] + [(S - A) - (1 + r + \rho)(S - A)] + A}_{\text{Acquire}} - \underbrace{[\pi_{NA}(l) + (1 + r)A]}_{\text{Do not acquire}} = 0. \quad (6)$$

Solving for $N_{il}(S) = 0$, we get the maximum willingness to pay for each of the two net gain functions as

$$v_{il} = [1 + r + \rho]^{-1}[\pi_A(i) - F_i - \pi_{NA}(l) + \rho A] \quad (7)$$

Then we use that $R_l^* = (1 + r + \rho)I_l$ and $I^{\min} = S$ in equation (4):

$$N_p(S) = \underbrace{[\pi_p(p) - E] - S - [(1 + r + \rho)S - S] - F_p}_{\text{Invest}} - \underbrace{0}_{\text{Do not invest}}. \quad (8)$$

Solving for $N_p(S) = 0$, we get:

$$v_p = [1 + r + \rho]^{-1}[\pi_p(p) - F_p - E] \quad (9)$$

We need to ensure that private equity firms and MNEs are able to make the promised repayments in Stage 3. For inequality *I5 – I6*, a private equity firm has Stage 3 profits of $[\pi_p(p) - E]$ and is forced to make a repayment of $R_p^* = \pi_p(p) - F_p - E$. The net profits are thus $[\pi_p(p) - F_p - E] - [\pi_p(p) - F_p - E] \geq 0$. For inequality *I4*, an acquiring MNE have product market profits equal to $\pi_A(i)$ and is forced to make a repayment of $[\pi_p(p) - F_p - E] - (1 + r)A$ making the net profits equal to $\pi_A(i) - [\pi_p(p) - F_p - E] + (1 + r)A \geq 0$. This expression is positive since for *I4* it holds that $v_{ip} > v_p$ or that $\pi_A(i) - F_i - \pi_{NA}(p) > \pi_p(p) - F_p - E$, which can be rewritten as $\pi_A(i) - F_i - [\pi_p(p) - F_p - E] > \pi_{NA}(p)$. Since $\pi_{NA}(p) > 0$, it must be that $\pi_A(i) - F_i - [\pi_p(p) - F_p - E] + (1 + r)A \geq 0$. For inequality *I1 – I3*, an MNE have profits equal to $\pi_A(i) - F_i$, and is forced to make a repayment of $\pi_A(i) - F_i - \pi_{NA}(i) - (1 + r)A$ making the net profits equal to $\pi_A(i) - F_i - [\pi_A(i) - F_i - \pi_{NA}(i) - (1 + r)A] = \pi_{NA}(i) + (1 + r)A \geq 0$.

We now examine how the incentives for cross-border acquisition and buyout pattern depend on the synergies γ . From equations (5), and (3) it follows that the valuations of MNEs v_{ip} and v_{ii} increase monotonically in synergies γ , whereas the private equity valuation v_p is independent of γ . Thus, we can state the following Lemma:

Lemma 2 *There exists a unique γ^{BO} defined from $v_{ip}(\gamma^{BO}, \cdot) = v_p$ and a unique γ^{PE} defined from $v_{ii}(\gamma^{PE}, \cdot) = v_p$.*

To explain and illustrate our results, we will make use of the following assumption which, for instance, holds in the LQC model. Assumption A2 allows us to derive a simple graphical solution where all types of relevant equilibria are present.

Assumption A2 $\gamma^{PE} > \gamma^{BO} > 0$.

In Figures 2 (i) and 2 (ii), we derive the equilibrium ownership structure (EOS) for which the size of synergies γ varies. Let us start with Figure 2 (i). When synergies are low $\gamma \in (0, \gamma^{BO})$, the MNE's takeover valuation is lower than the private equity firms value of buying out the firm. This is illustrated in Figure 2 (i) where the v_p curve is above the v_{ip} curve. Thus, without sufficient synergies, the associated increase in concentration is not sufficient to make an MNE acquisition profitable.

From Assumption 1, the takeover valuation, v_{ip} increases in synergies, γ . Indeed, the profit as an acquirer $\pi_A(i)$ increases in γ ,

$$\frac{d(v_{ip} - v_p)}{d\gamma} = (1 + r + \rho)^{-1} \frac{d\pi_A(i)}{d\gamma} > 0. \quad (10)$$

A further increase in synergies γ will thus make a takeover acquisition strictly profitable as $v_{ip} > v_p$. The equilibrium sales price is then $S^* = v_p$. This is illustrated at point *BO* in Figure 2 (i), where takeover acquisitions occur in the region $\gamma \in [\gamma^{BO}, \gamma^{PE})$.

Finally, we turn to the case of high levels of synergies $\gamma \in (\gamma^{PE}, \gamma^{\max})$. Using Assumption 1, we can note that the preemptive valuation of MNEs v_{ii} will increase more than the takeover valuation v_{ip} since increasing synergies do not only increase the product market profit as an acquirer but also decrease the product market profit as a non-acquirer. Thus, the preemptive valuation v_{ii} is not only driven by the benefits of obtaining a strong position in the product market as an acquirer, but also by the preemptive motive for avoiding a weak position as a non-acquirer:

$$\frac{d(v_{ii} - v_p)}{d\gamma} = (1 + r + \rho)^{-1} \left[\frac{d\pi_A(i)}{d\gamma} - \frac{d\pi_{NA}(i)}{d\gamma} \right] > 0. \quad (11)$$

It then follows that a further increase in complementarities into the region $\gamma \in (\gamma^{PE}, \gamma^{\max})$ will make a preemptive acquisition strictly profitable as $v_{ii} > v_p$. A fierce bidding competition among MNEs then drives the equilibrium sales price to $S^* = v_{ii}$. This is illustrated by point *P* in Figure 2 (i).

Therefore, we can state the following Proposition:

Proposition 2 *(i) A cross-border buyout will take place if the complementarities between MNEs' firm-specific assets and the target firm's assets are low, $\gamma \in (0, \gamma^{BO})$, (ii) a MNE*

takeover-acquisition will take place with $S^* = v_p$ if the complementarities are intermediate, $\gamma \in [\gamma^{BO}, \gamma^{PE})$, and (iii) a MNE preemptive-acquisition will take place with $S^* = v_{ii}$ if the complementarities are high, $\gamma \geq \gamma^{PE}$.

When will we then observe cross-border buyouts? There are two forces leading to buyouts in this setting. First, we have the classical Salant condition (Salant et al. (1983)) which puts limitation on acquisitions by incumbents: all non acquiring incumbents benefits from another incumbent buying the target since they then could benefit from the concentration in the market without paying for it. The PE firm could therefore exploit this and acquire the target even though the incumbent would be more cost efficient at running the target.⁵ Moreover, if the private equity's restructuring advantage increases, i.e. F_i increases, a buyout becomes more likely. This follows immediately from that v_{ii} decrease in F_i and that v_p is independent of F_i . Consequently, we can state that

Proposition 3 *Cross-border buyouts can take place due to a free riding problem among incumbents in entry deterring acquisitions and due to a restructuring advantage of for PE firms.*

4 What determines the cross-border buyout share of all cross-border acquisitions?

Having set up a model of bidding competition between MNE firms and private equity firms, let us now turn to comparative statics on the determinants of when a private equity buyout or an acquisition takes place. We focus on four aspects: financial market conditions (interest rates), financial market development (transaction costs), intellectual property rights protection (spillovers), and business regulation (administrative cost of restructuring).

Figure 2(iii) shows how equilibrium ownership is jointly determined by the synergies γ and the exit cost for PE. Let $E^{BO}(\gamma)$ be the *Buyout condition* (BO-condition) defined from $v_{ip} = v_p$, and let $E^{PE}(\gamma)$ be the *preemption condition* (PE-condition) defined from $v_{ii} = v_p$. Solving for E in each equation, we have:

$$\begin{aligned} E^{BO}(\gamma) &= \pi_A(i) - \pi_{NA}(p) - \pi_P(p) + \rho A + (F_p - F_i), \\ E^{PE}(\gamma) &= \pi_A(i) - \pi_{NA}(i) - \pi_P(p) + \rho A + (F_p - F_i). \end{aligned} \quad (12)$$

⁵This can be shown in the LQM. Proofs available upon request from the authors.

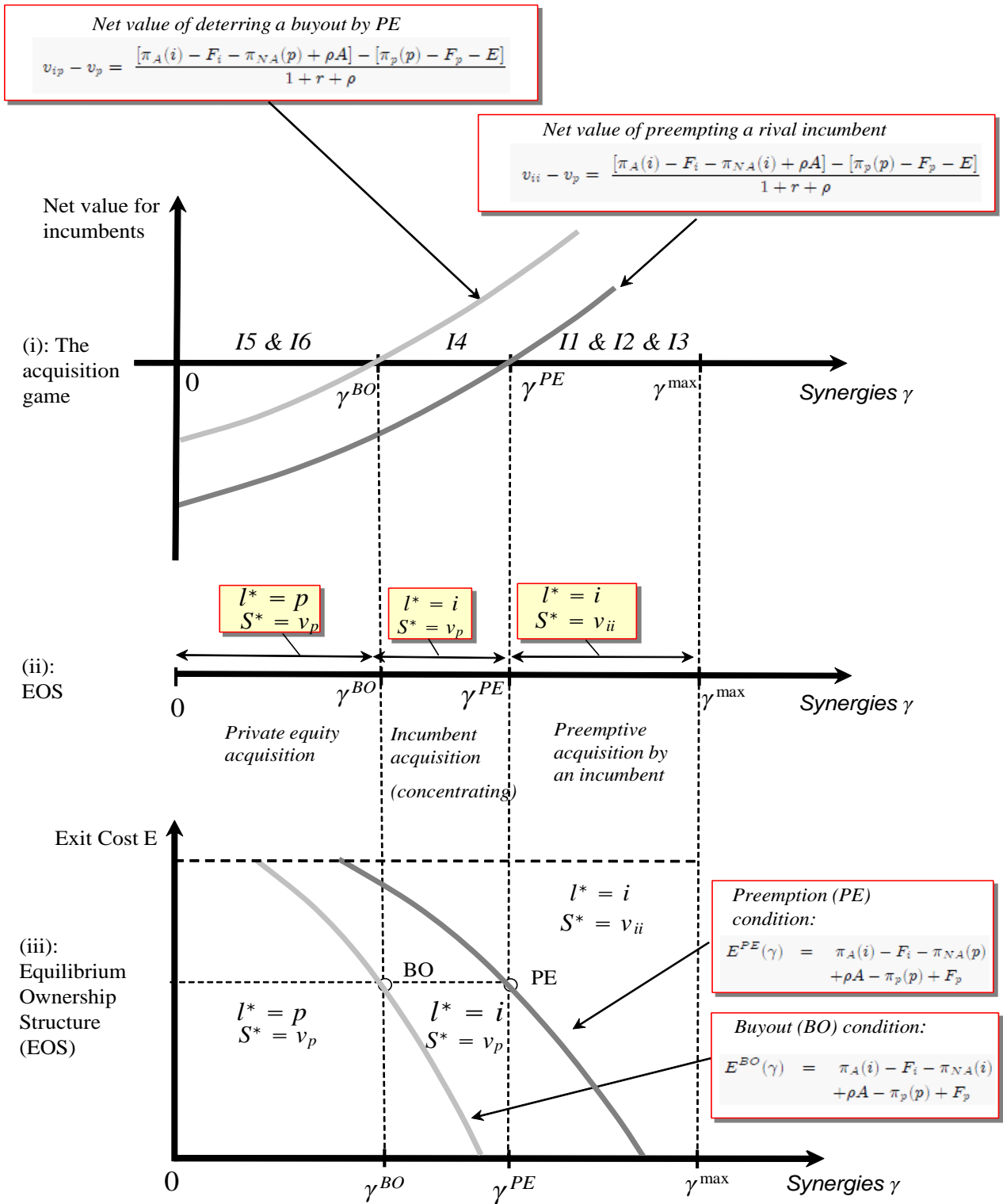


Figure 2: Solving for the equilibrium ownership pattern.

The loci associated with both the takeover condition $E^{BO}(\gamma)$ and the preemption condition $E^{PE}(\gamma)$ are downward-sloping in the $\gamma - E$ space since the profit of the acquirer increases in synergies γ , the profits of a non-acquirer $\pi_{NA}(l)$ are decreasing in synergies γ , and a lower exit cost for the private equity is needed to balance the incumbent's higher value of obtaining the target.

Preemptive acquisitions occur to the right of the preemption locus $E^{PE}(\gamma)$, as indicated by $l^* = i$ and $S^* = v_{ii}$, here the exit costs are too high for PE to compete, and the very high levels of synergies for the MNE make the acquisition very attractive which is why they compete with each other for the ownership of the target firm. Below this point for lower values of both E and γ , the PE can compete with MNEs for the ownership of the target firm. Until we hit the $E^{BO}(\gamma)$ border, MNEs will be winning the auction and performing entry deterring acquisitions between the takeover locus $E^{BO}(\gamma)$ and the preemption locus $E^{PE}(\gamma)$, indicated as $l^* = i$ and $S^* = v_p$, since for any given E , the synergies γ are still high enough (and likewise, for any given γ , E are still too high), In other words; the combinations of E and γ are such that exit costs are still too high for the high levels of synergies for PE to be able to compete with MNE for the ownership of the target firm. Below this buyout line $E^{BO}(\gamma)$, the combinations of the costs and synergies make it more profitable for the PE to own the target firm, so we have buyouts to the left of the entry deterrence locus $E^{BO}(\gamma)$, where the ownership is indicated as $l^* = p$ at a sales price v_p .

We can now use (12) to undertake different comparative statics to determine how the acquisition-buyout pattern is affected by different economic factors.

4.1 Financial market development

Financial market development is likely to affect the private equity share of cross-border transactions positively since potential buyers are affected by transaction costs associated with takeovers asymmetrically depending on the type. Private equity firms who own the target and its assets temporarily incur exit costs when reselling the restructured target firm. In contrast, this cost is not present for MNEs who are permanent owners of the target and its assets. If the target firm is in a country with high levels of financial development, the PE will face lower costs associated with its exit sale which will translate into a higher share of PE buyouts. With a higher level of development the sale will take place faster not only motivated by the supply side, but a firm up for sale in a country with a functioning financial market will be more attractive to potential buyers as well. In addition, in a developed market the exit procedures will likely be standardized, and neither the selling nor the buying party will have to face unforeseen additional charges that could increase risks associated with sales.

Inspecting equation 12 it follows that with a higher exit cost E , the buyout condition

$E^{BO}(\gamma)$ shifts downward as the private equity firm's valuation of acquiring the target decreases, shrinking the area (and therefore the share) of PE buyouts.

Consequently, we can state that:

Proposition 4 *Higher financial market development in the target firm country lowers exit costs for private equity firms E , which increases the likelihood of a buyout.*

4.2 Financial market conditions

Financial market conditions vary over the business cycle and refer to firms' cost of acquiring outside funding for their projects and acquisitions. In our model, we can capture the financial market conditions with the cost of obtaining outside financing for the acquisition (the interest rate r , and the risk premium ρ where applicable) where we impose the simplification that both types of buyers can only borrow from banks when financial intermediation is necessary. Private equity firms are dependent on the availability of cash from outside investors to be able to make an acquisition. MNEs on the other hand have retained earnings, A , which they could use to finance an acquisition. Our model provides the following predictions.

Proposition 5 *(i) Buyout shares are not affected by financial market conditions (interest rates r), but they correlate negatively with the acquisition price, if firms have full access to both the borrowing and lending markets. (ii) Improved financial market conditions (lower risk premium ρ) will increase the likelihood of buyouts, if firms do not have full access to the lending market.*

To see (i), note that equation 12 show that both $E^{BO}(\gamma)$ and $E^{PE}(\gamma)$ are independent of the interest rate r . However, it does determine the acquisition price since we have under each type of acquisition:

$$\begin{aligned}\frac{dS_i^*}{dr} &= \frac{dv_{ii}}{dr} = -(1+r+\rho)^{-2}[\pi_A(i) - F_i - \pi_{NA}(i)] < 0, \\ \frac{dS_p^*}{dr} &= \frac{dv_p}{dr} = -(1+r+\rho)^{-2}[\pi_P(p) - F_p - E] < 0.\end{aligned}$$

The higher is the cost of borrowing r , the lower are acquisition prices. Intuitively, while MNEs have retained earnings A to use as payment in an acquisition, these retained earnings have an opportunity cost dictated by the same interest rate r that determines the cost of borrowing funds. Hence, having retained earnings does not lower the cost for an MNE for making the acquisition because the MNE accounts for the opportunity cost of using these funds. Perfect financial markets makes an MNE indifferent between using retained earnings and financing the acquisition using outside financing. The equilibrium acquisition prices, however, do respond to financial market conditions since the costlier

it is to obtain financing for an acquisition the lower is the profitability of making the acquisition and hence the lower are the valuations MNEs and PE put on the target.

Let us now turn to how the risk premium ρ affects the buyout pattern. Inspecting equation 12 it follows that both the buyout condition $E^{BO}(\gamma)$ and the preemption condition $E^{PE}(\gamma)$ shift downward as the value of the MNE's retained earnings used as payment in the acquisition increases. With higher risk premium ρ , fewer combinations of E and γ fall under PE ownership and the share of PE buyouts decreases. Intuitively, a higher interest rate premium is more costly for a private equity firm since it does not have retained earnings it can use to finance the acquisition. In effect, an MNE "saves" ρA by being able to use retained earnings instead of going to outside investors to be able to finance the entire cost of acquiring the target. This implies that MNEs are able to pay more for the target firm in a given acquisition and so it is more likely that an acquisition by an MNE takes place when access to outside financing is limited. Consequently, we have proved part (ii).

4.2.1 Relaxing Assumptions of identical risk premia

Different Risk Premia, $\rho_{MNE} \neq \rho_{PE}$ As we stated in Section 2.5, the risk premia accounts for credit risk that could be different for the two types of borrowers. Thus we could formulate the difference in rates between PE and MNE as banks charge the same underlying rate to both types of borrowers, but denote the risk premia associated with MNEs as ρ_{MNE} and risk premia associated with PE as ρ_{PE} . We have that for $l \in \{i, p\}$:

$$N_{il}(S) = \underbrace{[\pi_A(i) - F_i - S] + [(S - A) - (1 + r + \rho_{MNE})(S - A)] + A}_{\text{Acquire}} - \underbrace{[\pi_{NA}(l) + (1 + r)A]}_{\text{Do not Acquire}} = 0.$$

To see how equation 12 would then be updated to reflect the differences, first we calculate the different valuations in this setting to evaluate $E^{BO}(\gamma)$:

$$v_{ip} = [1 + r + \rho_{MNE}]^{-1}[\pi_A(i) - F_i - \pi_{NA}(p) + \rho_{MNE}A], \quad (13)$$

and the valuation for the Private Equity then takes the value:

$$v_p = [1 + r + \rho_{PE}]^{-1}[\pi_p(p) - F_p - E]. \quad (14)$$

$E^{BO}(\gamma)$ would then become:

$$E^{BO}(\gamma) = -E = \frac{[\pi_A(i) - F_i - \pi_{NA}(p) + \rho_{MNE}A][1 + r + \rho_{PE}]}{[1 + r + \rho_{MNE}]} - [\pi_p(p) - F_p]. \quad (15)$$

Let's consider the situation where we move from a setting where the premia are equal to the more likely case of $\rho_{PE} > \rho_{MNE}$. As stated in the different interest rates section, PE firms with their high levels of leverage, lack of additional collateral will likely carry additional risk and will be charged a higher premium in borrowing funds in the market than the MNEs that can provide capital investment, as well as other cash stock as collateral:

$$\frac{\partial E^{BO}(\gamma)}{\partial \rho_{PE}} = \frac{[\pi_A(i) - F_i - \pi_{NA}(p) + \rho_{MNE}A]}{[1 + r + \rho_{MNE}]} > 0$$

Thus if we allow for different risk premia for types of buyers, in a setting where $\rho_{PE} > \rho_{MNE}$ we will have the Buyout curve shift down compared to the $E^{BO}(\gamma)$ curve suggested by equation(12), decreasing the combinations of γ and E that correspond to a PE buyout out of the total acquisition plane, implying a lower share of LBOs compared to the setting where risk premia were equal.⁶

4.3 Intellectual property rights

A survey of U.S. manufacturing firms conducted by Mansfield (1994) revealed that the importance of IPR regimes for investment decision depends on the purpose of the investment project. In the case of investment in sales and distribution outlets, only about 20 percent of survey respondents were concerned about IPR protection. In the case of investment in rudimentary production (i.e., involving basic technologies) and assembly facilities, 30 percent of respondents viewed IPR protection as important. This percentage increased to 50–60 for investments in manufacturing components and complete products and to 80 when R&D facilities were involved. Moreover, in a case study, (Sharp and Barz 1997, p.110) state that ICI, a synthetic organic chemicals company, and Zeneca, a pharmaceutical company;

“... are wary of piracy and doubtful about transferring either product or process know-how to these [transition] countries. Both companies, however,

⁶In the reverse, unlikely case of switching from a regime of equal risk premia to $\rho_{MNE} > \rho_{PE}$, we see the way that the difference in the risk premium will affect the cutoff in the following way:

$$\frac{\partial E^{BO}(\gamma)}{\partial \rho_{MNE}} = \frac{A[1 + r + \rho_{MNE}][1 + r + \rho_{PE}] - [\pi_A(i) - F_i - \pi_{NA}(p) + \rho_{MNE}A][1 + r + \rho_{PE}]}{[1 + r + \rho_{MNE}]^2}$$

The sign of this argument is unclear. It is very likely that $A[1 + r + \rho_{MNE}][1 + r + \rho_{PE}]$ is greater than the difference between the premium of owning the firm versus PE ownership and cost F, but we cannot rule the alternative out mathematically.

recognize that eventually Central and Eastern Europe and the FSU [former Soviet Union] will be important markets. That is why Zeneca is investing in developing its distribution links in highvalue-added areas such as medical supplies and equipment and healthcare systems.”

Javorcik (2004) uses a unique firm-level data set from Eastern Europe and the former Soviet Union and finds that weak protection deters foreign investors in technology-intensive sectors that rely heavily on intellectual property rights. Moreover, the results indicate that a weak intellectual property regime encourages investors to undertake projects focusing on distribution rather than local production.

Thus intellectual property rights protection is likely to affect the private equity share of cross-border transactions because these affect the ability of MNEs to use their firm specific assets in the target firm’s country. The firm will not be willing to transfer technologies to the target that may easily spillover to rivals which will affect its own performance negatively. We capture this in our model through the ownership efficiency parameter by assuming that weaker intellectual property rights implies that MNE’s γ decreases since the MNE is not making full use of the complementarities between the target and its existing assets. It then follows immediately from Proposition 2 that the likelihood of buyouts decreases when intellectual property rights strengthens. Thus we can state the following result:

Corollary 1 *Higher intellectual property rights protection in the target firm’s country allows MNEs to better utilize their firm specific assets and thus decreases the buyout share.*

4.4 Business regulation

Publicly traded firms are subject to tight bookkeeping, accounting and reporting standards which imposes a restriction on time spent on productive activities. Private equity backed firms can have an advantage as compared to publicly traded firms due to less stringent reporting requirements as private equity backed firms are not listed on a stock exchange. Therefore increasing these business regulations will thus likely affect MNEs more than private equity firms. The effect is further accentuated since private equity backed firms have a comparative advantage in managerial expertise which the MNE will be hard pressed to compete with if their executive staff is spending time on unproductive activities without strategic gains. This relates higher levels of regulation with our measure of restructuring for MNEs in that we assume that stronger business regulations increases the MNE’s fixed cost of restructuring F_i .

Corollary 2 *Higher business regulation in the target firm’s country increases MNEs’ restructuring costs and thus increases the buyout share.*

5 Welfare effects of restricting buyouts

To assess the welfare effects of restricting buyouts for the domestic country, we will compare welfare for domestic consumers and the target firm in different market structures; a Non-discriminatory (*ND*) policy where both buyouts and acquisition are allowed versus a Discriminatory (*D*) policy which prohibits cross-border buyouts. To this end we let $PS(l)$ and $CS(l)$ denote the producer and consumer surplus when the ownership of target firm is either the MNE ($l = i$) or PE-firm ($l = p$). Welfare under ownership l will then be the sum of the producer and consumer surplus, $W(l) = PS(l) + CS(l) = S^*(l) + CS(l)$.

In each of the six potential equilibrium ownership outcomes in Table (1), we can investigate the difference between an *ND*- and *D*-policy:

I1: $v_{ii} > v_{ip} > v_p$: MNEs compete against each other for the ownership of the target, not including PE in the game does not alter the results.

I2: $v_{ii} > v_p > v_{ip}$: There are two equilibria here under the *ND*-policy. One where MNEs compete with each other again, and there is no effect of PE being present or absent in the auction. There is also another equilibria where no bidding competition between MNEs occur since all MNEs "coordinate" on bidding below v_p and thereby avoid the bidding competition, and we may have a buyout in equilibrium. However, under the *D*-policy the buyout equilibrium cannot occur.

I3: $v_{ip} > v_{ii} > v_p$: Here v_p is too low for the MNE to react to it with a higher v_{ip} and drive up the prices. Competition is again between MNEs, the absence of PE in the auction under *D*-policy has no effect on the outcome.

I4: $v_{ip} > v_p > v_{ii}$: The PE firm acts as an active threat in the auction under regime as its valuation has a bite over v_{ii} . Since MNE's valuation of the firm when the alternative buyer is of the PE type, v_{ip} , is the highest valuation, the sales price S^* under MNE ownership goes up from v_{ii} to a strictly higher v_p under the *ND*-policy. Under *D*-policy the threat effect is missing, and the sale price remains at v_{ii} .

I5: $v_p > v_{ii} > v_{ip}$: Under *ND*-policy, the target is PE owned with $S^* = v_p$ as opposed to MNE ownership with $S^* = v_{ii}$ under *D*-policy.

I6: $v_p > v_{ip} > v_{ii}$: Again, *ND*-policy allows for PE ownership instead of MNE with a higher sales price v_p rather than v_{ii} .

An itemized breakdown of welfare for each of the domestic actors under the different regimes the *ND*-regime and the *D*-regime will be as follows:

Domestic Target Firm: Faces the same sales price $S^* = v_{ii}$ for Inequalities *I1* and *I3* under both policies. For *I4-I6* the target gets a lower sales price v_{ii} instead of v_p in the absence of PE in the bidding process. Under *I2* the target firm might be better off under the *D*-regime since the restrictive law then forces the MNEs to compete over the target firm and raise the sales price from v_p to v_{ii} .

Consumers: Consumer surplus depends on both the number of firms that service the market (m , or $m + 1$), as well as the synergies between the owners and the target firm (γ) both of which will affect prices for the domestic market. Under *I1-I4* with MNE ownership, there may be fewer (m) firms serving the market which could be negative for CS, but the target owner will operate with the complementarity level γ which, for high enough values, can overturn the negative effect of the smaller market. Under *I5* and *I6*, however, there will be $m + 1$ firms in the market which is positive for consumer surplus, however in this scenario the positive effect from synergies will not be at play. Therefore the consumer surplus evaluation yields ambiguous results that depend on the interplay of these two parameters.

5.0.1 An illustrative graphically welfare analysis

In the section below, we will graphically illustrate how blocking cross-border buyouts affects domestic welfare. A solution to the model incorporating welfare effects is presented graphically in Figure 3. It can be shown that the figure is valid in the Linear Quadratic Cournot (LQC) model presented in Norbäck and Persson (2008).⁷

We first note that Figure 3(i) shows that entry deterring MNE acquisitions can occur for complementarities below unity, i.e. where γ is above the threshold γ^{BO} but below one. Welfare inefficient entry deterring MNE acquisitions therefore can lead to decreased consumer surpluses compared to PE-buyouts for two reasons: First, productivity in the acquired firm is lower than in a PE-buyout, which will lead to higher equilibrium consumer prices which hurts consumer surplus. Second, the MNE acquisition leads to a market concentration compared to a PE-buyout, which induces an additional decrease in consumer surplus. Thus, we note that consumers may lose if the government applies the Discriminatory policy in the region $[0, \gamma^{BO}]$, as demonstrated in panel (iii).

The aggregate welfare effect for the domestic economy is illustrated in Figure 3(iv) where we have coupled the consumer surplus with the difference in equilibrium sales price for the target firm. As illustrated in Table 1, S^* is higher in the presence of PE competition up to γ^{PE} , thus so is total surplus under the laissez faire policy.⁸

However, it follows that if the fixed cost restructuring advantages of the PE-firm increases, i.e. $F_i - F_p$ increases, the Net value of deterring a buyout by PE curve will shift to the right and welfare inefficient PE-buyouts may take place.

Changes in the risk premium affects the two types of potential buyers differently, as

⁷Proofs available upon request from authors.

⁸As demonstrated in Table 1, we could have two different ownership competitions under *I2*. If the MNEs are competing with each other, we have no difference in the equilibrium sales price under either type of policy, which is the case we have focused on here and also in the Figure 3. In the event where PE actually has an effect on the price competition for the target, preventing PE entry would result in a lower equilibrium sales price S^* and therefore a lower Total Surplus even in the region $[\gamma^{PE}, \gamma^{\max}]$. We chose not to focus on this case, in line with the rest of the paper.

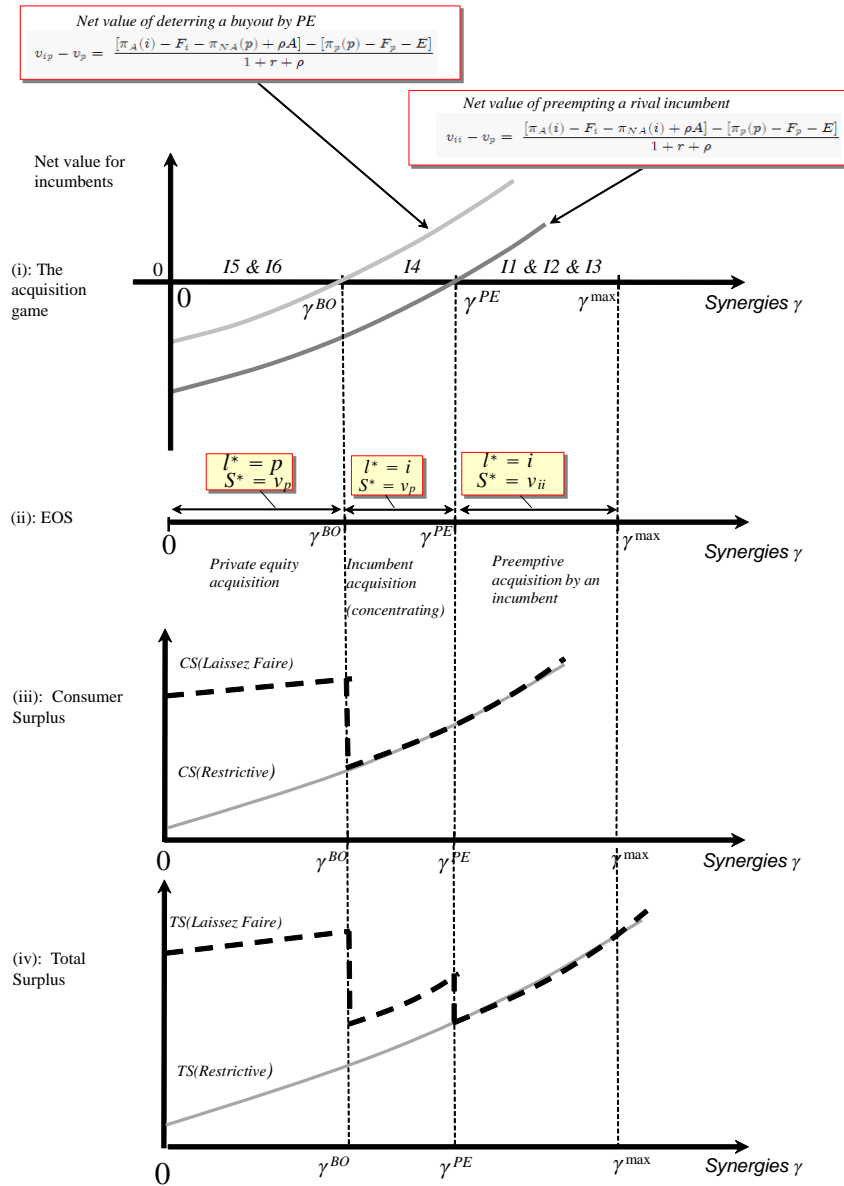


Figure 3: Solving for Consumer and Total Surplus under different equilibrium ownerships. Following Table 1, we focus on the case where I2 results in $S^* = v_{ii}$.

demonstrated by the Equilibrium Ownership Structure in Figure 4. The figure shows changes in the equilibrium ownership and equilibrium sales price as risk premia increase for given synergy levels. In the figure, MNE ownership only occurs under high enough synergies, as predicted. In line with Section 4.2, since PE do not have access to retained earnings in the financing of the acquisition, a higher risk premia means a higher cost of borrowing for a given acquisition. On the contrary, a MNE type buyer can tap into own sources and avoid facing a rise in their financing cost if the premium was to rise. In a setting of high risk premia, this results in an MNE being able to pay more in a given acquisition, and bid out the PE buyer. Thus, for higher values of the premia, the share of target firms owned by PE decreases.

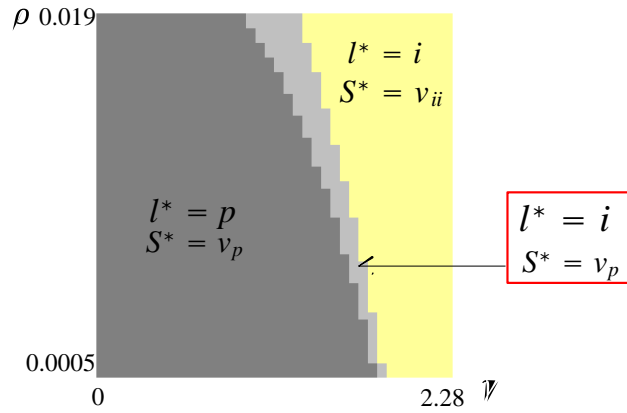


Figure 4: Equilibrium Ownership Structure under varying risk premia ρ and synergies γ . The parameter values are set at $n = 3$, $a - c = 5$, $rA = 0.61$, $k \in [0, 0.76]$, $F_P = 0$, $E \in [0, 1.49]$, $F_i = 1$, $\gamma \in [0, 2.28]$, $r = 0.037$, $\rho \in [0.0005, 0.0195]$. See section ?? in the Appendix for the details on the parametrization of the model.

In our model, an increase in the risk premium will shift the Net value of deterring a buyout by PE curve will shift to the left implying that the likelihood that welfare inefficient PE-buyouts may take place decreases.

Summarizing we can state the following results:

Proposition 6 *Restricting cross-border buyouts can (i) decrease consumer surplus and total surplus unless the private equity firm's relative fixed cost advantage is smaller than MNE's synergies, (ii) the private equity firms' restructuring advantage decreases when the risk premium in the economy is high since they have less retained earnings than MNEs, which implies that restricting cross-border buyouts in such situations could be even more counter productive.*

Thus performing a welfare analysis on the effects of restricting foreign private equity buyouts, we underscore that buyouts can be welfare improving both because private equity firms could be more efficient than foreign MNEs at running the target firm and

because a private equity buyout prevents concentration in the product market. Hence, a policy of restricting foreign cross-border buyouts could be counterproductive. In particular, we show that this threat is higher in times when the risk premium in the economy is high, which would put MNEs at a comparative advantage over PEs due to their retained earnings. In this setting, any PE winning the bidding competition for the target firm over the MNEs cannot be "too inefficient" in comparison.

6 Concluding remarks

The globalization process implies that new business models spread wider and faster over the world. We have underscored that a full 8.2% of all cross-border mergers and acquisitions that took place during 1998-2010 were cross-border buyouts undertaken by private equity firms. We show that private equity can exploit their specialization in restructuring to outbid MNEs with firm specific assets and retained earnings. Retained earnings are shown to give MNEs a large advantage not when general interest rates are high since the opportunity cost of their retained earnings then increases, but when risk premiums are high which does not affect the opportunity cost of their retained earnings.

Further, we have demonstrated a reason for why restricting cross-border private equity buyouts will be counterproductive for welfare if the target firm is initially sufficiently efficient. Cross-border private equity buyouts will then increase product market competition, and will do so in a sufficiently cost efficient way.

While, it is well established that cross-border mergers and acquisitions play a key role in the global industrial development and restructuring process, our model is, to the best of our knowledge, the first to incorporate financial buyers that compete with multinational MNE firms for domestic firms that are up for sale and to characterize the conditions under which multinational firms will be outbid. As such, we identify an important role of the private equity firms as challengers of existing international oligopolies. These results suggests that policies improving the international corporate transaction market would be preferred to policies restricting cross-border private equity buyouts.

In the analysis we have assumed that the private equity firm exit by means of an IPO or sale to another outsider. However, a substantial share of all private equity exists is by means of a sale to an incumbent. In that setting, while the main results of the paper will still be valid, from a welfare point of view a private equity buyout will not restore intensity of competition in the product market in the long run. However, Norbäck et al. (2011) show that the private equity firm that exits by a sale to an incumbent will have an incentive to invest more in restructuring to enhance the bidding competition of the target firm in the exit. This tends to benefit consumers but can hurt producers.

References

- Bertrand, O. and Zitouna, H.: 2006, Trade liberalization and industrial restructuring: the role of cross-border mergers and acquisitions, *Journal of Economics and Management Strategy* **15**, 2. Working Paper Series 647, Research Institute of Industrial Economics.
- Bjorvatn, K.: 2004, Economic integration and the profitability of cross-border mergers and acquisitions, *European Economic Review* **48**(Issue 6), 1211–1226.
- Blonigen, B. A.: 1997, Firm-specific assets and the link between exchange rates and foreign direct investment, *American Economic Review* **87**(3), 447–465.
- Falvey, R.: 1998, Mergers in open economies, *The World Economy* **21**, 1061–1076.
- Farrell, J. and Shapiro, C.: 1990, Horizontal mergers: An equilibrium analysis, *American Economic Review* **80**, 107–126.
- Head, K. and Ries, J.: 1997, International mergers and welfare under decentralized competition policy, *Canadian Journal of Economics* **30**(4), 1104–1123.
- Head, K. and Ries, J.: 2006, Fdi as an outcome of the market for corporate control: Theory and evidence. Sauder School of Business Working Paper.
- Horn, H. and Persson, L.: 2001, The equilibrium ownership of an international oligopoly, *Journal of International Economics* **53**, 307–333.
- Javorcik, B.: 2004, The composition of foreign direct investment and protection of intellectual property rights: Evidence from transition economies, *European Economic Review* **48**, 39–62.
- Jehiel, P. and Moldovanu, B.: 1999, Resale markets and the assignment of property rights, *Review of Economic Studies* **66**, 971–991.
- Jehiel, P. and Moldovanu, B.: 2000, Auctions with downstream interaction among buyers., *RAND Journal of Economics* **31**, 768–791.
- Jehiel, P., Moldovanu, B. and Stacchetti, E.: 1999, Multidimensional mechanism design for auctions with externalities., *Journal of Economic Theory* **85**, 258–293.
- Jensen, M. C.: 1986, Agency costs of free cash flow, corporate finance and takeovers., *American Economic Review* **76**, 323–329.
- Jovanovic, B. and Rousseau, P.: 2002, The q-theory of mergers, *American Economic Review* **92**, 198–204.

- Lommerud, K. E., Straume, O. and Sorgard, L.: 2006, National versus international mergers in unionized oligopoly, *RAND Journal of Economics* **37**, 212–233.
- Maksimovic, V. and Phillips, G.: 2002, Do conglomerate firms allocate resources inefficiently? evidence from plant-level data, *Journal of Finance* **57**, 721–767.
- Mansfield, E.: 1994, Intellectual property protection, foreign direct investment, and technology transfer, *International Finance Corporation Discussion Paper* **19**.
- Mattoo, A., Olarrega, M. and Saggi, K.: 2004, Mode of foreign entry, technology transfers, and fdi policy, *Journal of Development Economics* **75**, 95–111.
- Neary, J.: 2007, Cross-border mergers as instruments of comparative advantage, *Review of Economic Studies* **74**(4), 1229–1257.
- Norbäck, P.-J. and Persson, L.: 2007, Investment liberalization - why a restrictive cross-border merger policy can be counterproductive., *Journal of International Economics* **72**, 366–380.
- Norbäck, P.-J. and Persson, L.: 2008, Cross-border mergers & acquisitions policy in service markets, *Journal of Industry, Competition and Trade* **8**(3), 269–293.
- Norbäck, P.-J., Persson, L. and Tåg, J.: 2010, Buying to sell: Private equity buy-outs and industrial restructuring. IFN Working Paper No. 817. Available at SSRN: <http://ssrn.com/abstract=1532757>.
- Norbäck, P.-J., Persson, L. and Tåg, J.: 2011, Acquisitions, entry and innovation in network industries. IFN Working Paper No. 867.
- Park, W.: 2008, International patent protection: 1960-2008, *Research Policy* **37**(4), 761–777.
- PSE: 2007, Hedge funds and private equity: A critical analysis. Report of the PSE Group in European Parliament.
- Raff, H., Ryan, M. and Stähler, F.: 2006, Asset ownership and foreign-market entry. CESifo Working Paper Series 1676, CESifo Group Munich.
- Salant, S. W., Switzer, S. and Reynolds, R. J.: 1983, Losses from horizontal merger: The effects of an exogeneous change in industry structure on Cournot-Nash equilibrium, *Quarterly Journal of Economics* **98**, 185–199.
- Sharp, M. and Barz, M.: 1997, Multinational companies and the transfer and diffusion of new technological capabilities in central and eastern europe and the former soviet union, in D. A. Dyker (ed.), *The Technology of Transition. Science and Technology Policies for Transition Countries*, Central European University Press, pp. 95–125.

Strömberg, P.: 2008, *The new demography of private equity.*, The Globalization of Alternative Investments Working Papers Volume 1: The Global Economic Impact of Private Equity Report 2008, World Economic Forum, Geneva, pp. 1–26.

Thomsen, S.: 2009, Should private equity be regulated?, *European Business Organization Law Review* **10**, 97–114.

Walker, D.: 2007, Guidelines for disclosure and transparency in private equity. London: BVCA.

A Appendix

A.1 Data description

Our annual cross border mergers and acquisitions data comes from the Capital IQ database for years 1998-2010 and covers only cross border majority acquisitions. Since we look only at completed acquisitions, not those merely announced or planned, the finalized data comes with a slight lag. Capital IQ indicates if the buyout is of the Leveraged Buyout PE type or not.

We use the NBER definition for recessions and reference their U.S. Business Cycle Expansions and Contractions list for the quarterly recession data used in our figure. (<http://www.nber.org/cycles.html>)

Federal Reserve Bank of St. Louis' economic database Federal Reserve Economic Data (FRED) publishes historical annual averages of 12-Month London Interbank Offered Rate (LIBOR) based on the U.S. Dollar.

The Patent protection data is from Park (2008).

A.2 Proof of Lemma 1

First, $b_i \geq \max\{v_p, v_{ii}, v_{ip}\}$ is a weakly dominated strategy. No owner wants to post a bid above its valuation of obtaining the assets and the assets will always be sold.

Inequality *I1* ($v_{ii} > v_{ip} > v_p$): Since $v_{ip} > v_p$, an MNE will always have an incentive to outbid private equity firms. The MNEs will then bid up the price to v_{ii} to prevent a rival from obtaining the assets. A MNE will obtain the assets.

Inequality *I2* ($v_{ii} > v_p > v_{ip}$): Since $v_p > v_{ip}$, the outcome depends on what a MNE believes will happen if it does not win. If it believes that another MNE will win, MNEs will then bid up the price to v_{ii} and a MNE will obtain the assets. If it believes that a private equity firm will win, then since $v_p > v_{ip}$ the private equity firms will bid up the price to v_p and a MNE will obtain the assets.

Inequality *I3* ($v_{ip} > v_{ii} > v_p$): Since $v_{ip} > v_p$, a MNE will always have an incentive to outbid private equity firms. The MNEs will then bid up the price to v_{ii} to prevent a rival from obtaining the assets. A MNE will obtain the assets. Since MNEs realize that a private equity firm will never obtain the assets ($v_{ip} > v_p$), the price will not be bid up to v_{ip} .

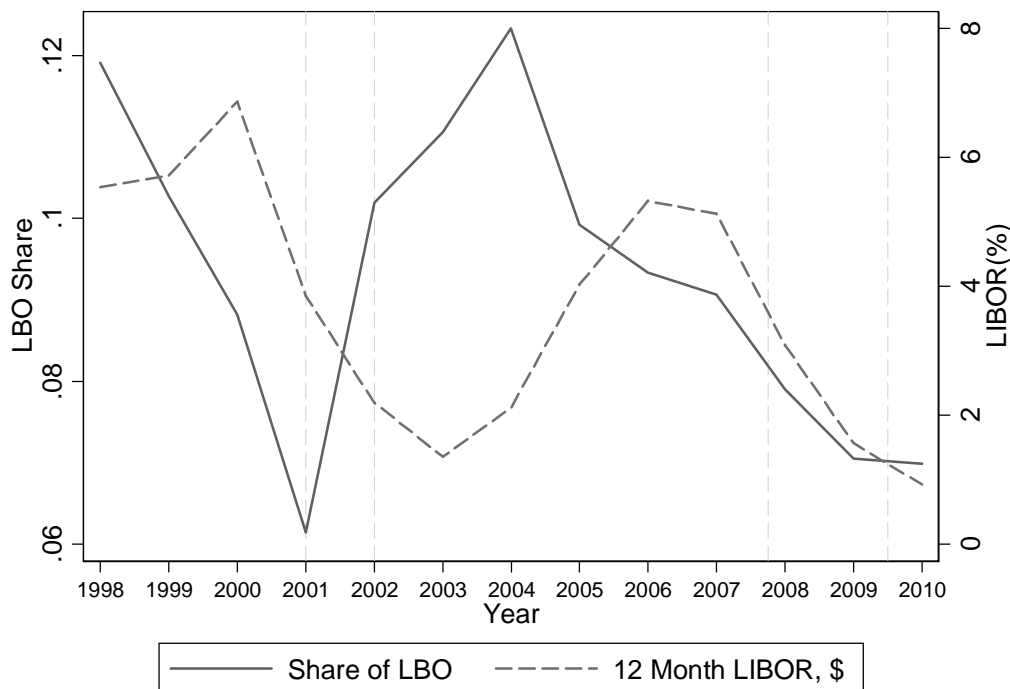
Inequality *I4* ($v_{ip} > v_p > v_{ii}$): Since $v_{ip} > v_p$, a MNE will always have an incentive to outbid private equity firms and bid up the price to slightly above v_p . However, only one MNE has this incentive, since no other MNE wants to outbid him or her ($v_p > v_{ii}$). A MNE will then obtain the assets at price v_p .

Inequality *I5* ($v_p > v_{ii} > v_{ip}$): Since $v_p > v_{ip}$, no MNEs will want to outbid the private equity firms. The private equity firms will then bid up the price to v_p and a private equity

firm will obtain the assets.

Inequality $I6$ ($v_p > v_{ip} > v_{ii}$): Since $v_p > v_{ip}$, no MNEs will want to outbid the private equity firms. The private equity firms will then bid up the price to v_p and a private equity firm will obtain the assets.

A.3 Figures



Source: CapitalIQ, NBER, FRED.

Figure 5: The cross-border buyout share and the 12 Month LIBOR based on U.S. Dollar over time. NBER quarterly recession boundaries are marked for the 2001 and 2008 recessions. As predicted in Section 4.2, periods leading up to and during recessions where the risk premia ρ is high LBO shares tend to fall. LBO shares also fall when LIBOR rates are high, as the high borrowing costs prevent PE type buyers from competing with MNE types that can rely on retained earnings to meet high sales prices for target firms.

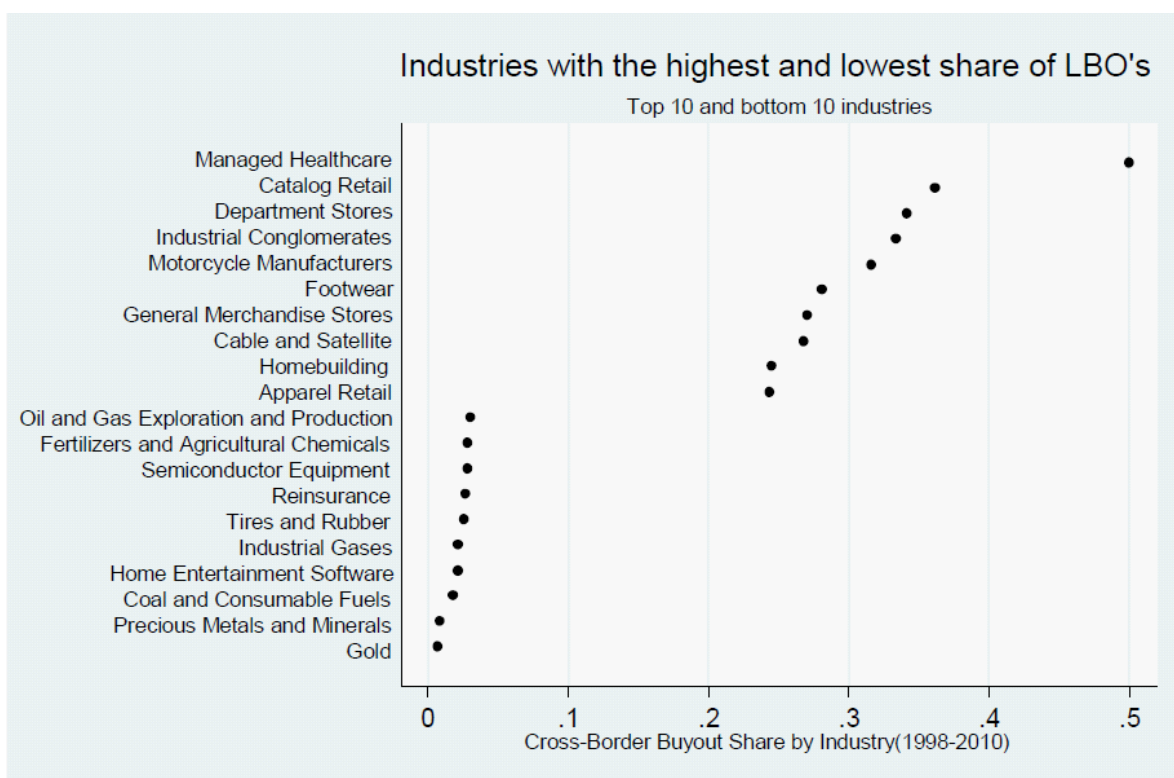


Figure 6: Cross-border buyout share across industries. Industry indicators are available for a small portion of the data.

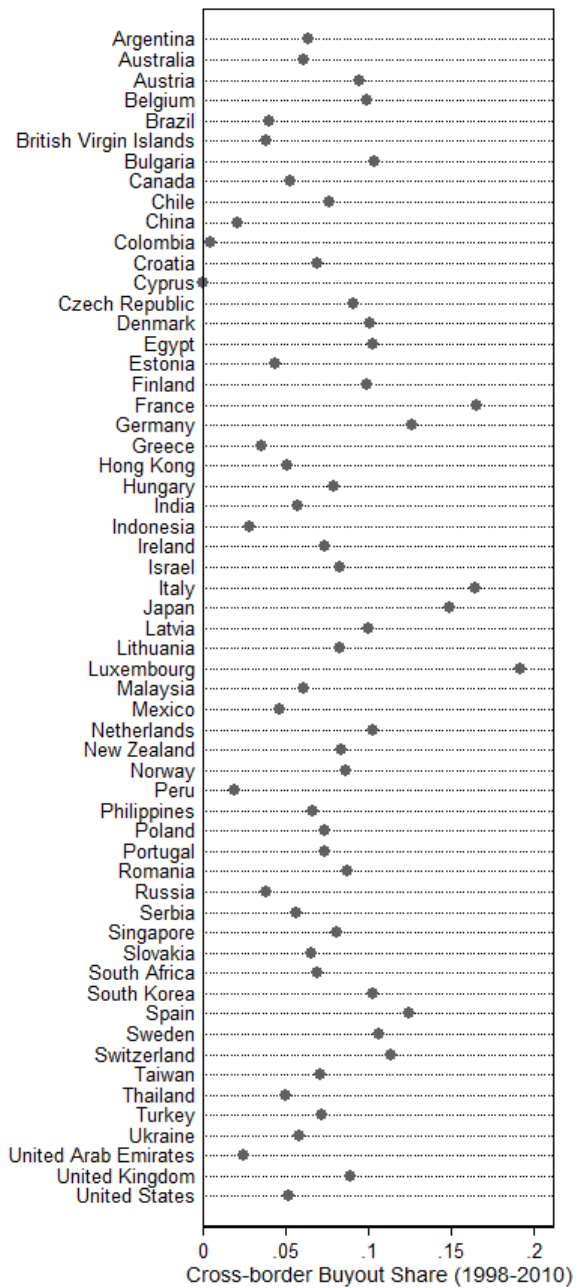


Figure 7: The cross-border buyout share across countries for 1998-2010. Source: Capital IQ

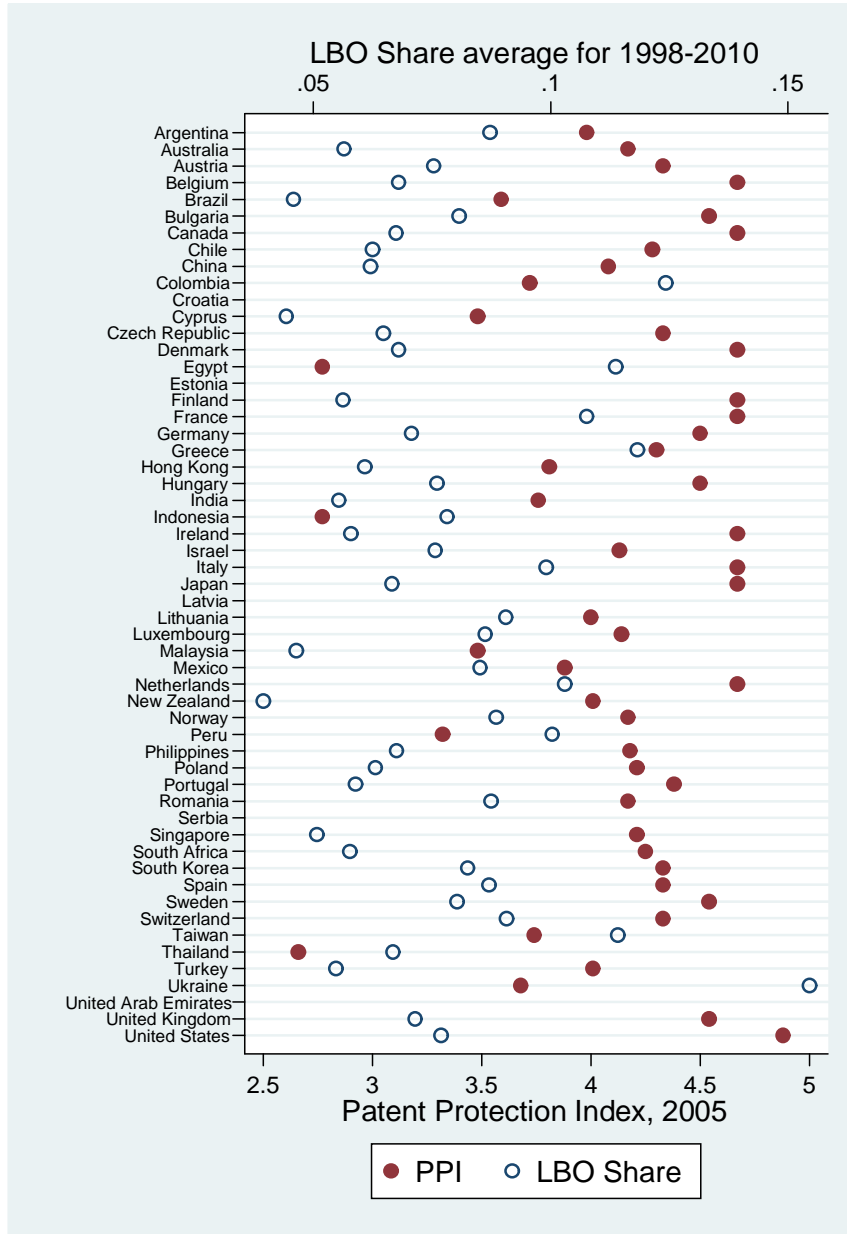


Figure 8: Cross-border buyout share average for the years 1998-2010 against Patent Protection Index for the year 2005. As predicted in section 3.3, we see that countries with higher Patent Protection Index generally have lower shares of LBOs as Patent Protection asymmetrically promotes transfer of firm-specific knowledge and therefore MNE type buyouts. Source for PPI data comes from Park (2008), LBO data is from Capital IQ.