Gains from multinational competition for cross-border firm acquisition

Onur A. Koska

Abstract

This study shows that when there is multinational competition for foreign acquisition, the strategic use of a consumer welfare argument in regulating foreign market entry leads to a preemptive foreign acquisition. Even under fierce competition, foreign acquisition will emerge as part of a non-cooperative equilibrium (although multinationals would have gained more had they been able to credibly commit to a cooperative equilibrium of independent foreign sales, either via greenfield investment or trade under complete liberalization) which increases local welfare by more than both the case without foreign market entry and the case with foreign market entry via independent foreign sales.

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1 Introduction

Multinational firms have been playing a crucial role for economic integration: acquisitions of existing foreign assets in host countries have surpassed investments in new assets (greenfield investment), and multinational sales through foreign affiliates have outnumbered exports since the 1980s. According to the traditional models of foreign direct investment (FDI) (such as the knowledge capital model by Markusen, 1984; Horstmann and Markusen, 1992; Markusen and Venables, 1998; and the proximity-concentration trade off and the tariff-jumping hypothesis articulated by Brainard, 1993; 1997), undertaking FDI forgoes economies of scale at the plant level (as firms incur plant-level fixed FDI costs to locate their production and services close to consumers). That said, by undertaking FDI, firms can well benefit from firm-level economies of scale (generated by their intangible assets) and can avoid trade-related costs. In general, the literature has shown that horizontal FDI (that duplicates the production process in a foreign country) is encouraged by large market size, high trade and transport costs and low plant-level fixed investment costs (e.g., see Navaretti and Venables, 2004). That is, there is a threshold fixed investment cost (the level of which is determined by market size, trade costs, and firms' marginal costs) below which horizontal FDI is more profitable than trade (e.g., see Antrás and Yeaple 2014).[1] This, however, leads to the conclusion that, as most countries liberalized trade and foreign investments around the same time, and as trade costs have been gradually decreased (and they have been significantly low), the probability of horizontal FDI should substantially decrease. This conclusion, however, does not consider cross-border mergers and acquisitions, which are in most cases subject to certain enforcement practices and/or foreign market entry regulations.

This study thus (i) models cross-border firm acquisitions as an alternative foreign market entry mode; (ii) focuses on a specific foreign market entry regulation, in which a consumer-welfare argument is strategically used;[2] and (iii) allows for competitive bidding for foreign acquisition. In particular, the model focuses on multinational competition for potential cross-border firm acquisition, for which there is a minimum output requirement imposed by the host country as part of its foreign market entry regulation. In a simple oligopolistic market entry model, this study shows that cross-border firm acquisitions may emerge as the equilibrium foreign market entry mode even when they will have earned multinationals less profits compared to trade in the times of complete trade liberalization abolishing trade costs, and/or compared to greenfield investment

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[1] In particular, low trade costs warrant even a lower fixed investment cost threshold below which FDI will be more profitable than trade. Alternatively, in a trade model with monopolistic competition and firm heterogeneity, Helpman *et al.* (2004) show that there is sorting by productivity thresholds determining firms' foreign market entry modes. By the same token, in a simple linear Cournot model with constant marginal production costs and firm heterogeneity, it is straightforward to show that (e.g., see Koska *et al.* 2018a), unless there is prohibitively large fixed investment cost, denoted F, (so FDI is not profitable for any firm), or unless there is negligibly small F (so FDI is more profitable than trade for all firms), for any F, there is a corresponding threshold cost type, denoted $\lambda(F)$, such that firms with marginal cost $c^* < \lambda(F)$ will prefer FDI over trade, and those with $c^* > \lambda(F)$ will prefer trade over FDI.

[2] A consumer welfare argument that can be considered the common practice in most countries as documented by Breinlich *et al.* (2017) challenges mergers and acquisitions on the basis whether they lessen competition and adversely affect consumers.

when fixed costs are small, and when there is no significant fixed cost saving among different entry modes.[3]

Recent FDI models take into account cross-border mergers and acquisitions and study optimal foreign market entry modes (e.g., see Görg, 2000; Das and Sengupta, 2001; Bjorvatn, 2004; Norbäck and Persson, 2004; Müller, 2007; Fatica, 2010; Koska 2015) and their welfare implications and optimal government policies (e.g., Barros and Cabral, 1994; Head and Ries, 1997; Horn and Levinsohn, 2001; Mattoo *et al.*, 2004; Saggi and Yildiz, 2006; Norbäck and Persson, 2007). This literature shows that the optimal foreign market entry mode is determined mainly according to the trade-off between trade costs, fixed investment costs, and firm acquisition costs.[4] As for welfare implications, it is well established that greenfield entry may reduce welfare, especially if foreign entrants are not sufficiently productive. Similarly, cross-border mergers and acquisitions can be optimal for a foreign firm, although they can be anticompetitive and decrease welfare by increasing market concentration, especially if efficiency gains are not sufficient.[5] Most studies in this literature focus on a single foreign firm's market entry, and thus they abstract from important implications of strategic bidding competition among multinationals for foreign acquisitions. Given the extent of multinational activities around the globe, however, competition among multinationals is inevitable. As for the studies looking at the welfare implications of a foreign firm's market entry and the optimal government policy, they focus only on foreign ownership restrictions (e.g., see Norbäck and Persson, 2007; or Bose *et al.*, 2011), or on competition policies by antitrust authorities (e.g., see Horn and Levinsohn, 2001; or Kejzar, 2011). While Bose *et al.* (2011) show that it is optimal to impose ceilings on foreign ownership of domestic firms (especially if the government's objective is to maximize domestic shareholders' gains), Norbäck and Persson (2007) find that it is optimal to allow not only for greenfield entry, but also for cross-border mergers and acquisitions at the same time. This latter finding is consistent with the empirical evidence that most countries have removed restrictions on foreign ownership and do not make a distinction between greenfield entry and foreign acquisitions; see UNCTAD (2000), for details. The literature is, however, silent on whether host countries that liberalize trade and remove restrictions on foreign ownership can avoid

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[3] Helpman *et al.* (2004) document that some firms may prefer FDI over exporting also in situations where trade is liberalized, so long as there are sufficient transport costs. Alternatively, Koska *et al.* (2018a) show that if there is ex ante incomplete cost information, and if FDI can serve as a signal of high productivity, then greenfield FDI can be optimal even when trade and transport costs are zero. Similarly, Koska (2019) finds that also FDI through acquisition of a local firm can be the optimal entry mode in the times of complete trade liberalization.

[4] In particular, it can be argued that foreign acquisitions can be more profitable than greenfield entry, especially when the cost of shared ownership is relatively low, and/or when foreign acquisitions generate significant synergies (reducing production costs) among firms (e.g., see Raff *et al.*, 2006; 2009; 2012).

[5] The Industrial Organization (IO) literature on mergers and acquisitions shows that a merger is profitable only if it includes at least 80 per cent of the total number of firms in the market so that there is no substantial business stealing by the firms that do not participate in the merger, which is referred to as the merger paradox (see Salant *et al.*, 1983). The literature shows that such a merger paradox can be avoided especially when a merger leads to sufficient efficiency gains as in Perry and Porter (1985); when there is convex demand as in Hennessy (2000); when products are sufficiently differentiated as in Lommerud and Sorgard (1997); and/or when firms compete in a market of strategic complements as in Deneckere and Davidson (1985).

detrimental welfare effects of FDI, especially through a foreign market entry regulation favoring consumer welfare.

The IO literature has already scrutinized, to some extent, the implications of a consumer-welfare argument employed as a competition policy practice. That is, the IO literature focuses on mergers between firms that are already competing in the same market and on the application of a consumer-surplus standard in approvals of domestic mergers; see, for example, Dertwinkel-Kalt and Wey (2016); Nocke and Whinston (2010); and Goppelsroeder et al. (2008). In the case of domestic acquisitions, any transfer of surplus among firms still contributes to total welfare. With foreign market entry, however, some surplus is transferred from local agents to multinationals (which may not retain their profits in the host country). Foreign acquisition will increase consumer welfare (relative to the case when there is no foreign market entry), while transferring local profits abroad. That is, an antitrust authority would approve such foreign acquisitions based on consumer welfare, although such foreign market entry would be welfare decreasing (especially had there been no sufficient efficiency gains). Alternatively, as the current study would like to demonstrate, the host country can incorporate a consumer welfare argument into its foreign market entry regulation, and can better address the detrimental welfare effects of FDI. The important implications of incorporating a consumer welfare argument into foreign market entry regulations have been overlooked, especially in the context of potential cross-border firm acquisitions by the trade and FDI literature. The exception is Koska (2019) that takes on board a minimum output requirement (based on a consumer-welfare argument) imposed by the host country as part of its foreign market entry regulation. In Koska (2019), there is *seller competition* (local firms compete to sell their business to a foreign firm), although there is only one foreign firm entering the host country. In contrast, this paper focuses on *buyer competition* (foreign firms compete to acquire a local firm). Norbäck and Persson (2008) take both types of competition on board (and they consider an oligopolistic market structure) and study different types of firm buyouts (domestic vs foreign and hostile vs preemptive takeover), although they do not consider any foreign market entry regulation, nor do they look at welfare implications. This study, thus, extends discussions of both Koska (2019) and Norbäck and Persson (2008).

The model focuses on two potential foreign entrants (with their headquarters outside the host country) competing for foreign acquisition of a local firm and scrutinizes the implications of imposing a minimum output requirement for cross-border firm acquisitions on foreign market entry behavior and welfare. The idea follows the observation that (i) multinationals do negotiate with host countries before their foreign market entry; and that (ii) certain production requirements can be imposed by host countries on foreign market entry. Moreover, anecdotal evidence shows that host countries might try to exploit competition among multinationals to help local firms earn higher rents for their scarce and valuable domestic assets.[6] In general, detrimental effects of mergers and acquisitions on consumers are minimized when the merged firms (or the new entity) behave

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[6] See, for example, the role Chinese government officials played in the bidding competition between SABMiller (British brewer) and Anheuser-Busch (American brewer) for Harbin Brewery (Chinese brewer) as discussed in Norbäck and Persson (2008).

more aggressively in terms of production. Although host countries that liberalize trade and remove restrictions on foreign ownership lose some important policy tools, this study shows that they can still strategically regulate their markets further for foreign market entry so as to increase local welfare. The idea is to strategically use a consumer welfare argument and impose a minimum output requirement for foreign acquisitions.

In a linear Cournot model with constant marginal production costs, introducing a minimum output requirement for foreign acquisitions implies that only those with sufficient efficiency gains will be incentive compatible for foreign acquiring firms. As is demonstrated in this study, when the minimum output requirement is determined in a way that consumers will have gained (should there be a foreign firm acquisition), also the acquired local firm will have gained by receiving a higher acquisition price (especially through the bidding competition between the foreign firms). In particular, this study shows that in a non-cooperative equilibrium, a host country can lead a foreign firm to acquire the local firm for purely preemptive reasons (so long as there is competition for the local firm's assets).[7] Consequently, a host country can substantially gain in terms of local welfare, and can even trap multinationals in a "prisoner's dilemma" situation, especially when there is fierce competition for foreign acquisition. Although multinationals could have gained more had they been able to credibly commit to independent foreign sales (either via greenfield FDI or trade) following complete liberalization, they will have a strong incentive to deviate from such mutually beneficial "cooperative" equilibrium, and thus will end up bidding up the acquisition price to the extent that they will earn less in a non-cooperative equilibrium.

The rest of the paper is organized as follows. Section 2 introduces the model. Section 3 details the minimum output requirement warranted by the strategic use of a consumer welfare argument in regulating foreign market entry, and solves the model for the equilibrium market entry modes. In particular, this section shows that when there is multinational competition for potential foreign acquisition, the strategic use of a consumer welfare argument in regulating foreign market entry leads the multinationals to compete for potential foreign acquisition for purely preemptive reasons. Section 4 scrutinizes the welfare implications of the model. This section demonstrates that when there is multinational competition for potential cross-border firm acquisition, any foreign acquisition that fulfills the minimum output requirement leads to higher local welfare as compared to the case multinationals enter the host country by independent foreign sales (or compared to the initial case without foreign market entry). Finally, Section 5 concludes the study.

2   The model

The model considers a host country market initially served by a monopoly local firm, denoted firm *l*. Following the stylized facts on multinationals such that their intangible assets enable them to

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[7]   As will be clear in Section 3, efficiency gains are the key in such a preemptive motive for foreign acquisitions. Also Molnar (2007) shows that such preemptive firm acquisitions are empirically supported by US data.

penetrate oligopolistic markets, the model assumes that entry to this market is restricted: that is, similar to Koska (2019) and Koska *et al.* (2018a), firms that are willing to produce for this market need Z units of a specific factor to develop intangible assets within firm boundaries so as to be able to produce at all. The aggregate supply of this factor is strictly less than $4Z$ and the outside option of this factor determines its wage, which is normalized to unity. Therefore, the model focuses on a single local firm (already invested in specific factor Z) and two potential entrants with their headquarters outside the host country (to avoid dissipation of their knowledge capital), namely multinational firms 1 and 2.[8] Note that investment in specific factor Z only makes the firms productive for the host country market, and thus fixed cost Z plays no role in determining foreign market entry modes. All firms are risk neutral and produce a homogeneous good. Following the common observation in most countries, the model assumes that the multinationals have a cost advantage over the local firm.[9] The multinational firms are identical in their ex-ante (constant) marginal cost of production (especially when they both export, or undertake greenfield investment, under complete liberalization), denoted $c_1 = c_2 = c^*$, while the local monopoly firm's constant marginal cost of production is $c_l = c > c^*$, where $c \in (0,1)$.

Alternatively, one of the multinationals can acquire existing assets of the local firm. It should be noted that although the two multinationals are ex ante identical in their production costs, foreign acquisition leads them to differ in their ex-post productivity. The idea is that efficiency gains generated by foreign acquisition of the local firm are different among multinationals, especially when different foreign assets are combined with local assets. In particular, foreign acquisition enables the acquiring multinational and the acquired local firm to combine their assets, and thus to decrease marginal production costs. Let $\theta_k \in [0, \overline{\theta}]$, $k \in \{1, 2\}$, denote the ex-post marginal cost of the multinational after having acquired existing assets of firm l. As in Koska (2019), $\overline{\theta}$ is the upper bound that is implied by the strategic use of a consumer welfare argument in regulating foreign market entry, which warrants a minimum output requirement for foreign acquisition, that is, any foreign takeover that generates sufficient synergies such that $\theta_k \leq \overline{\theta}$, $k \in \{1, 2\}$ (so that it fulfills the minimum output requirement) will be allowed by the host country as part of its foreign market entry regulation; see Condition 1.[10]

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[8] The model assumes two foreign firms that have already maintained capacity in different countries, and thus refers to these firms as multinationals.

[9] The model assumes a local firm (without capacity anywhere but the host country) and two foreign firms that have already maintained capacity in different countries and they owe their superior productivity to their large R&D investments and intensive use of professional and technical workers generating proprietary knowledge. This merely follows the stylized facts on multinationals. For instance, Müller (2007: 95) reports that it is the common observation that local firms in many markets in Central and Eastern Europe generally possess a less efficient production technology compared to multinational firms entering those markets.

[10] It will be clear in Section 3 that $\overline{\theta}$ is determined through commitment to a minimum output level in the case of foreign acquisition as the outcome of negotiations between the host country and the multinationals. As the focus of the study is multinational competition for potential foreign acquisition, the cases that $\theta_k > \overline{\theta}$, $k \in \{1, 2\}$ (those that do not qualify for the minimum output requirement) are assumed away. Also it should be noted that the specifics of the model do not allow for domestic firm entry (e.g., some specific foreign intangible assets are required to penetrate a local monopoly/duopoly market, and local assets only together with more efficient foreign assets generate synergies and fulfills the minimum output requirement given by Condition 1).

Consumers' preferences in the host country can be represented by a quadratic utility function that leads to the linear inverse demand function given by $P(Q) = (1 - Q)$, where P is the market price of the homogeneous good and Q stands for aggregate output. Total production (or sales) if both multinationals opt for alternative market entry modes (other than foreign acquisition), referred to as independent foreign sales, $Q^f = q_l^f + \sum_k q_k^f$, comprises the two multinationals' total outputs $\sum_k q_k^f$, $k \in \{1, 2\}$, and the local firm's output q_l^f, where superscript f stands for independent foreign sales, and subscript l represents the local firm.[11] If one of the two multinationals enters the host country by acquiring existing assets of the local firm, then there will be a duopoly market structure, in which case total sales, $Q^a = q_{kl}^a + q_{-k}^e$ - if multinational k acquires the local assets - will comprise the acquiring multinational's output q_{kl}^a and the non-acquiring multinational's output q_{-k}^e, $k \in \{1, 2\}$. Note that superscript a represents foreign acquisition of the local firm, and superscript e represents the non-acquiring multinational competing against foreign acquisition by independent foreign sales. Consistent with this notation, π_l^f and π_k^f, $k \in \{1, 2\}$, represent, respectively, the local firm's and the multinationals' profits when the multinationals penetrate the host country market by independent foreign sales, and π_k^a and π_{-k}^e represent those when multinational k, $k \in \{1, 2\}$, acquires local firm l. In the case of foreign acquisition of the local firm, the local firm earns the acquisition price, denoted Ω, which is determined endogenously. The interaction between firms takes place such that if foreign market entry is allowed by the host country in the first stage, then following the negotiations for foreign market entry with the host country, first the multinationals' foreign market entry modes are sorted (see Section 3 for details), then given the multinationals' foreign market entry modes, following their entry, all active firms in the market compete by quantities. The game is solved backwards.

In the last stage of the game (once the multinationals' entry modes are sorted), all active firms in the market engage in Cournot competition. Given the linear inverse demand function for a homogeneous good and the firms' constant marginal costs of production, in a linear Cournot oligopoly model, all firms make their output decisions simultaneously. The objective is to maximize profits, given by $\pi_i(\cdot) = (p(Q) - c_i)q_i$, where $i \in \{l, 1, 2\}$. The maximized firm profits thus can be expressed as a function of optimal firm outputs: $\pi_i^* = -(\partial p(Q)/\partial q_i)(q_i^*)^2$, where $(\partial p(Q)/\partial q_i) = -1$, and thus, $\pi_i^* = (q_i^*)^2$, where $i \in \{l, 1, 2\}$. Cournot solutions for the optimal quantities produced by each firm (q_i^*) in each case (i.e., monopoly, independent foreign sales by the two multinationals (oligopoly), and foreign acquisition of the local firm by one multinational (duopoly)), and the corresponding maximized profits are given below.

Consider first the case without any foreign market entry by either multinational in the host country (or the case the host country does not allow for foreign market entry), which is referred to as the local monopoly case. The local firm will be able to maintain its monopoly power, and will produce at the output level of $q_l^m = (1 - c)/2$ and will earn monopoly profit $\pi_l^m = (1 - c)^2/4$, where superscript m represents the monopoly case.

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[11] Throughout the study, exporting to the host country or undertaking greenfield investment in the host country is referred to as independent foreign sales.

Suppose now the market is completely liberalized for trade and foreign ownership, and market entry by foreign firms is allowed (which should be determined by the host country in the first stage of the game; see Section 4): in this context, exporting requires no trade costs under complete trade liberalization, and the differences in fixed costs among alternative entry modes are normalized to zero such that the multinationals are indifferent between trade and greenfield investment.[12] If both multinationals opt for independent foreign sales, and the three firms compete by quantities, then the local firm's output will be $q_l^f = (1 - 3c + 2c^*)/4$, and the two multinationals' outputs will be $q_1^f = q_2^f = (1 - 2c^* + c)/4$.

We can write each firm's profit as

$$\pi_1^f = \pi_2^f = \left(\frac{1 - 2c^* + c}{4}\right)^2; \quad \pi_l^f = \left(\frac{1 - 3c + 2c^*}{4}\right)^2. \tag{1}$$

It is clear from eq.(1) that in the case of oligopolistic market structure, a firm produces and earns more the smaller is its marginal production cost, while it produces and earns less the smaller the rivals' costs. Also, comparing eq.(1) with the monopoly outcome, it is straightforward to show that (i) market entry decreases the average industry marginal cost and increases competition with which the local firm's sales and profits decrease; and (ii) an increase in competition decreases the market price and increases aggregate sales. Note that the model assumes $(1 - 3c + 2c^*) > 0$ such that there is no crowding-out effect of market entry by multinationals.

If multinational $k \in \{1, 2\}$ acquires the existing assets of local firm l, and the other multinational competes against foreign acquisition by independent foreign sales, then the acquiring firm's output will be $q_{kl}^a = (1 - 2\theta_k + c^*)/3$, and the non-acquiring multinational's output will be $q_{-k}^e = (1 - 2c^* + \theta_k)/3$, and their profits will be, respectively:

$$\pi_{kl}^a = \left(\frac{1 - 2\theta_k + c^*}{3}\right)^2; \quad \pi_{-k}^e = \left(\frac{1 - 2c^* + \theta_k}{3}\right)^2, \tag{2}$$

where π_{kl}^a is multinational k's gross profits from foreign acquisition, and θ_k is its ex-post marginal cost of production. In case of foreign acquisition, acquiring multinational k will have to pay acquired firm l an acquisition price (Ω), which is determined endogenously; see the next section. Thus, the net return from foreign acquisition to multinational k is $\pi_k^a = \pi_{kl}^a(\theta_k) - \Omega$, and to the acquired firm is Ω. Foreign acquisition decreases competition by decreasing the number of firms by one as compared to the case that both multinationals enter the market by independent foreign sales. To offset the negative impact of a decrease in the number of firms on aggregate output, sufficient synergies in foreign acquisition (a sufficiently low ex-post marginal cost of production) is warranted. The next section shows that a minimum output requirement for foreign acquisition as part of the foreign market entry regulation not only warrants sufficient synergies but also can be used strategically to transfer surplus from multinationals to the local firm.

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[12] In particular, as in Koska (2019), the model can easily accommodate some non-prohibitive fixed investment and per-unit trade costs without changing the results qualitatively, although the exposition of the model will be more tedious without any further insight.

3 Multinational competition for foreign acquisition

Following Koska (2019), the minimum output requirement for foreign acquisition, which is warranted by the strategic use of a consumer welfare argument in regulating foreign market entry, is determined as the outcome of negotiations between the host country and the multinationals. Upon investing in specific factor Z that makes firms productive for the market, the multinationals express their interest in entering the host country market. The host country then asks the multinationals to open their books which will reveal the particulars of their performance should they enter the host country as a solo firm via independent foreign sales. The host country can easily solve their problem backwards, and can require any multinational to commit to not produce below a certain output level in the case of entry by foreign acquisition. Using a consumer welfare argument strategically, the host country can choose the minimum output requirement for foreign acquisition as one that secures the same aggregate output as in the case both multinationals enter the market via independent foreign sales.[13]

The model thus assumes that if foreign market entry is allowed (see Section 4 for discussions on this), then any foreign acquisition by a multinational will be allowed so long as it fulfills the minimum output requirement given by Condition 1:

Condition 1 (Consumer-surplus standard) *With foreign acquisition, a multinational should commit to produce at least* $\bar{q}_{kl}^a(\bar{\theta}, c^*)$ *such that* $Q^a(\bar{\theta}, c^*) = Q^f(c, c^*, c^*)$, *where* $\bar{\theta} = (3c + 2c^* - 1)/4$.

As in Koska (2019), given the Cournot setting with constant marginal costs, Condition 1 puts an upper bound to the ex-post marginal cost of the acquiring multinational such that $\theta_k \in [0, \bar{\theta}]$, $k \in \{1, 2\}$. To focus on multinational competition for foreign acquisition, suppose both multinationals can generate sufficient synergies by combining their assets with the local assets.

If neither multinational opts for foreign acquisition, then they both enter the market via independent foreign sales, which is referred to as the cooperative equilibrium. As is already discussed in Section 2, the multinationals differ in their ex-post productivity due to different efficiency gains their assets generate when combined with the local assets. Therefore, it is possible that only one multinational attempts to acquire the local firm, while the other multinational decides not to compete for foreign acquisition. If only multinational k has decided to acquire the local firm (while the other multinational has decided to enter the market via independent foreign sales), then multinational k's "takeover" valuation, denoted v_k^t, can be written as the difference between its acquisition profit given by eq.(2) and its profit when it competes against the other two firms by

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[13] Foreign acquisition generates efficiency gains by enabling the involving parties to combine their productive assets, and their ex-post performance depends on the complementary of such assets. That is, the host country can make a case against foreign acquisition (as this would not contradict the multinationals' optimization problem so long as there is a local firm that qualifies for such a requirement). That said, this is not true for trade, or greenfield entry (as this would be not optimal given the multinational's already established production technology).

independent foreign sales given by eq.(1):

$$v_k^t = \left(\frac{1 - 2\theta_k + c^*}{3}\right)^2 - \left(\frac{1 - 2c^* + c}{4}\right)^2 > \left(\frac{1 - 3c + 2c^*}{4}\right)^2, \tag{3}$$

which is greater than the local firm's rejection profit π_l^f given by eq.(1) as the minimum output requirement for foreign acquisition warrants $\theta_k \leq (3c + 2c^* - 1)/4$. In particular, eq.(3) suggests that, given the rival multinational entering the host country market via independent foreign sales, multinational k can takeover the local firm (by offering ε more than its rejection profit) and can earn more than its profit when it competes against the other two firms by independent foreign sales. This implies that given the rival multinational committing to independent foreign sales, each firm has a strong incentive to deviate from the "cooperative" equilibrium. Acquisition of the local firm, however, decreases the non-acquiring multinational's profit from independent foreign sales $(\pi_1^f = \pi_2^f \geq \pi_{-k}^e)$ insofar as $\theta_k \leq (3c + 2c^* - 1)/4$, and thus each firm has an incentive to preempt the rival's acquisition of the local firm.

Firm k's "preemptive" valuation, denoted v_k^p, can be written as the difference between its acquisition profit given by eq.(2) and its profit from independent foreign sales when the rival firm acquires the local firm such that

$$v_k^p = \left(\frac{1 - 2\theta_k + c^*}{3}\right)^2 - \left(\frac{1 - 2c^* + \theta_{-k}}{3}\right)^2 > v_k^t, \tag{4}$$

which is greater than its takeover valuation as $\theta_k \leq (3c + 2c^* - 1)/4$, where θ_{-k} represents the rival's post-acquisition marginal cost. Sufficient cost synergies are warranted to trigger preemptive acquisitions, which are also empirically supported; see Molnar (2007). The reason is that with sufficient cost synergies, the business-stealing effect by the non-acquiring firm can be avoided, and thus the acquisition of domestic assets becomes incentive compatible for both multinationals. Moreover not only do sufficient efficiency gains increase the acquiring multinational's profits, but also the valuation of the domestic assets (as the non-acquiring multinational will be negatively affected). By imposing a minimum output requirement for foreign acquisition, the host country thus guarantees that any permissible foreign acquisition should qualify for such cost synergies, increasing the multinationals' valuation of the domestic assets and leading to competition for a preemptive acquisition of the local firm.

Notice that, given the assumptions $c \in (0,1)$ and $1 - 3c + 2c^* > 0$ so that there is no crowding-out effect, the ex-post efficient multinational (e.g., firm 1) will have a higher preemptive valuation than the ex-post less efficient multinational (e.g., firm 2) such that $v_1^p > v_2^p$ given $\theta_1 < \theta_2$. Assuming an arbitrarily small probability that the ex-post less efficient multinational believes that it may still acquire the local firm against the ex-post efficient multinational, it is clear that

Proposition 1 *In equilibrium, both firms will compete for foreign takeover the outcome of which will be a preemptive foreign acquisition by the ex-post efficient multinational at a price that is (almost) equal to the ex-post less efficient multinational's preemptive valuation as expressed by eq.(4).*

Ex-post efficient multinational k's net gain from acquisition of the local firm is

$$\left(\frac{1-2\theta_k+c^*}{3}\right)^2 - \left[\left(\frac{1-2\theta_{-k}+c^*}{3}\right)^2 - \left(\frac{1-2c^*+\theta_k}{3}\right)^2\right], \tag{5}$$

where the first term is multinational k's gross (operating) profit after having acquired the local firm, given by eq.(2), and the expression in square-brackets is simply Ω, the acquisition price equal to the ex-post less efficient multinational's preemptive valuation. The following remarks are in order. The more efficient is multinational k – the lower is θ_k – the higher is its gross profit from foreign acquisition. Lower θ_k, however, implies a higher cost of foreign acquisition as it leads to a higher preemptive valuation for the ex-post less efficient multinational. By the same token, a lower ex-post marginal cost of the rival multinational implies also a higher acquisition price for multinational k. By putting an upper bound on the ex-post marginal costs of the multinationals competing for foreign acquisition, the minimum output requirement for foreign acquisition given by Condition 1 thus limits the ex-post surplus that multinationals can transfer abroad. Using eq.(4), eq.(5) can be rearranged such that the net gain from foreign acquisition to multinational k is

$$v_k^p - v_{-k}^p + \left(\frac{1-2c^*+\theta_{-k}}{3}\right)^2 \tag{6}$$

Note that the last term in eq.(6) is multinational k's outside profit such that it enters the host country via independent foreign sales enabling the rival multinational to acquire the local firm at a price (almost) equal to the local firm's reservation (rejection) price (π_l^f) given by eq.(1). Therefore the gain from foreign acquisition of the local firm to the ex-post efficient multinational k (relative to the case the rival multinational acquires the local firm) is $v_k^p - v_{-k}^p > 0$. Also, notice that $\lim_{\theta_k \to \theta_{-k}} v_k^p - v_{-k}^p = 0$, $k = \{1, 2\}$, that is, the smaller is the difference between ex-post marginal costs, the smaller is the gain from foreign acquisition relative to the case the rival multinational acquires the local firm.

This leads to

Proposition 2 *While each multinational has a strong incentive to deviate from a "cooperative" equilibrium, the strategic use of a consumer welfare argument in regulating foreign market entry (that warrants a minimum output requirement for foreign acquisition) together with "multinational competition" may lead to a "prisoner's dilemma" situation for the multinationals, especially when there is fierce multinational competition for the local firm's foreign acquisition.*

Proof: The strong incentive to deviate from a "cooperative" equilibrium is already discussed, and is clear from eq.(3). In the case that there is fierce multinational competition for the local firm's foreign acquisition, it can happen that only if both multinationals can credibly commit to independent foreign sales, then both multinationals earn higher profits ($\pi_i^f, i = \{1, 2\}$ given by eq.(1)) than their profits with the "acquisition" outcome given by eq.(2), that is, the difference in profits between the "non-cooperative" (acquisition) equilibrium and the "cooperative" (independent

foreign sales) equilibrium is

$$v_k^p - v_{-k}^p + \left[\left(\frac{1 - 2c^* + \theta_{-k}}{3} \right)^2 - \left(\frac{1 - 2c^* + c}{4} \right)^2 \right], \tag{7}$$

for the acquiring (ex-post efficient) multinational, and

$$\left[\left(\frac{1 - 2c^* + \theta_k}{3} \right)^2 - \left(\frac{1 - 2c^* + c}{4} \right)^2 \right] \tag{8}$$

for the non-acquiring (ex-post less efficient) multinational, where (i) fierce multinational competition for firm acquisition implies $\lim_{\theta_k \to \theta_{-k}} v_k^p - v_{-k}^p = 0$, $k = \{1,2\}$; and (ii) the last term in brackets in eq.(7) and the expression in brackets in eq.(8) are negative given $\theta_{-k} \le (3c + 2c^* - 1)/4$ implied by the minimum output requirement for foreign acquisition, given by Condition 1. ∎

It is mainly the outcome that qualitatively resembles the outcome of a prisoner's dilemma game.[14] While independent foreign sales (via trade or greenfield entry) can earn both firms higher profits, especially when there is fierce multinational competition for foreign acquisition, both multinationals have a strong incentive to deviate from independent foreign sales, and the minimum output requirement for foreign acquisition, given by Condition 1, leads to a preemptive acquisition of the local firm by the ex-post efficient multinational. That is, both multinationals' profits can be less than the case they could credibly commit to independent sales should there be fierce competition, and even in such a case, cross-border firm acquisition that fulfills Condition 1 will emerge as part of a non-cooperative equilibrium.

4 Welfare implications

The analysis above has been conducted on the basis that foreign market entry is allowed, and that there is a minimum output requirement for foreign acquisition. Depending on the welfare implications of different foreign market entry modes, however, the host country certainly can introduce different restrictive measures, and can even ban foreign market entry, in the first stage. That is, Condition 1 cannot be applied without allowing for foreign market entry, and thus it

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[14] In particular, the model can be structured along this way. Consider, for instance, firms' strategy space: *compete for acquisition of the local firm* vs. *do not compete for acquisition of the local firm*. If only one firm chooses to compete, then the outcome will be one firm acquiring the local firm at a price equal to its takeover valuation. If both firms choose to compete, then the outcome will be a preemptive acquisition by an ex-post more efficient firm. If neither firm chooses to compete, then they will have independent foreign sales in the host country. The outcome of all three firms merging to monopoly is not available as this will be most likely not approved by a competition authority. Also note that the model assumes an arbitrarily small probability that the ex-post less efficient multinational believes that it may still acquire the local firm against the ex-post efficient multinational. Thus it is also individually rational for the ex-post less efficient multinational to compete for foreign acquisition. It should now be clear that the non-cooperative equilibrium will be the outcome of both firms competing for foreign acquisition of the local firm, whereas the cooperative equilibrium will be the outcome of both firms refraining from such competition.

should be considered subordinate to the host country's foreign market entry regulation. The model assumes that the host country allows for foreign market entry so long as total welfare, defined as the sum of consumer welfare and the profit of the local firm, as given by eq.(9), does not decrease.

Local welfare (W) is given by

$$W^s = \left[\frac{1}{2} (Q^s)^2 + \pi_l^s \right]; \quad s \in \{m, f, a\}, \tag{9}$$

where Q^s is aggregate output, π_l^s is the local firm's profit, and s represents the market structure such that m is the monopoly case, f is the oligopoly case with independent foreign sales, and a represents duopoly between the two multinationals, one of which acquires the local firm.

Let $W^m(c)$ and $W^f(c, c^*, c^*)$ denote local welfare, respectively, when there is no foreign sale in the host country (local monopoly) and when the multinationals enter the host country by independent foreign sales. Also denote by W_m^f the welfare change relative to the monopoly case when the multinationals opt for independent sales. Following eq. (9), it is straightforward to show that

$$W^m = \frac{1}{2} \left(\frac{1-c}{2} \right)^2 + \left(\frac{1-c}{2} \right)^2 \tag{10}$$

$$W^f = \frac{1}{2} \left(\frac{1-2c^*+c}{4} + \frac{1-3c+2c^*}{4} + \frac{1-2c^*+c}{4} \right)^2 + \left(\frac{1-3c+2c^*}{4} \right)^2$$

$$W_m^f = \frac{1}{32} (-1 + 7c - 6c^*)(1 - 2c^* + c),$$

which immediately leads to

Lemma 1 *Compared to the monopoly case, local welfare improves with independent foreign sales ($W_m^f > 0$) insofar as the multinationals opting for such independent foreign market entry in the host country are sufficiently productive such that $c^* < (7c - 1)/6$.*

As is already mentioned in Section 1, this is a standard result in the FDI literature, which does not change with the strategic use of a consumer-welfare argument in regulating foreign market entry. To put it differently, there is no guarantee that foreign market entry through independent foreign sales improves welfare. That is, more restrictive foreign market entry regulations may be warranted depending on the productivity of multinationals. Local competition increases with independent foreign sales increasing (decreasing) aggregate sales (the market price), and thus consumer welfare increases. The more productive the multinationals - the smaller is c^* - the more the increase in consumer welfare. Although the multinationals' independent sales in the host country decrease the local firm's profit, consumer welfare increases by more than the decrease in the local firm's profit, especially when the multinationals' marginal costs are sufficiently low.

Let $W^a(\theta_k, c^*)$ denote local welfare when multinational firm k, having a smaller ex-post marginal cost θ_k (and thus a higher preemptive valuation v_k^p given by eq.(4)), has acquired the local firm and

the other multinational has entered the host country via independent foreign sales. Equation (11) gives $W^a(\theta_k, c^*)$, $k = \{1, 2\}$, such that

$$W^a(\theta_k, c^*) = \left[\frac{1}{2} \left(\frac{1 - 2\theta_k + c^*}{3} + \frac{1 - 2c^* + \theta_k}{3} \right)^2 \right] + \tag{11}$$

$$\left[\left(\frac{1 - 2\theta_{-k} + c^*}{3} \right)^2 - \left(\frac{1 - 2c^* + \theta_k}{3} \right)^2 \right],$$

where the second expression in square-brackets (in the second line) is simply the local firm's gain from foreign acquisition of its assets, that is, the acquisition price equal to the preemptive valuation of the non-acquiring multinational. Section 3 has already shown that both multinationals' preemptive valuation is greater than their takeover valuation which is greater than the local firm's rejection profit (i.e., $v_k^p > v_k^t > \pi_l^f$ for any $k = \{1, 2\}$; see equations (1), (3), and (4)). Also Condition 1 warrants that aggregate output with foreign acquisition is greater than that with independent foreign sales by multinationals, and thus consumer welfare given by the first expression in square-brackets in eq.(11) is also greater than that given by W^f in eq.(10). This leads to

Proposition 3 *When there is multinational competition for foreign acquisition, for which there is a minimum output requirement (given by Condition 1) warranted by the strategic use of a consumer welfare argument in regulating foreign market entry, local welfare with preemptive foreign acquisition is greater than that with both multinationals entering the host country via independent foreign sales.*

Local competition increases in both cases relative to the monopoly case. In the case both multinationals enter the host country via independent sales, two multinationals that are more productive than the local firm enter the market and increase (decrease) the number of firms (average industry marginal cost). By contrast, in the case of foreign acquisition, less productive local firm is replaced by an ex-post more productive foreign firm, while the other foreign entrant is ex ante also more productive than the local firm. Although in both cases aggregate output increases (and so does consumer welfare), the strategic use of a consumer welfare argument in regulating foreign market entry that warrants a minimum output requirement for foreign acquisition (given by Condition 1) guarantees that preemptive foreign acquisition (led by Condition 1) increases consumer welfare by more than independent foreign sales. By the same token, in both cases, some producer surplus is transferred from the local firm to the multinationals as foreign market entry by the multinationals decreases the local firm's profit relative to the monopoly case.

As is already shown, relative to independent foreign sales, with preemptive foreign acquisition, the local firm can retain more profits so long as there is multinational competition for foreign acquisition of its assets. Lemma 1 compares local welfare with independent foreign sales relative to the monopoly case, and shows that when the multinationals have sufficiently low marginal costs, the increase in consumer welfare surpasses the decrease in the local firm's profit, with which

local welfare increases. As for the change in local welfare with foreign acquisition relative to the monopoly case, however, comparing W^a given by eq.(11) with W^m given by eq.(10) shows that

Proposition 4 *Multinational competition for preemptive foreign acquisition that fulfills the minimum output requirement, given by Condition 1, bids up the local firm's gain to the extent that together with the increase in consumer welfare guaranteed by Condition 1, local welfare with foreign acquisition is always greater than that with local monopoly.*

Although the local firm's gain from foreign acquisition of its assets by the ex-post more efficient multinational relative to the monopoly case is smaller, multinational competition for foreign acquisition earns the local firm a significantly high acquisition price. In contrast to Koska (2019), the strategic use of a consumer welfare argument in regulating foreign market entry, which warrants a minimum output requirement for foreign acquisition as given by Condition 1, guarantees a level of consumer welfare that is always sufficient to surpass the decrease in the local firm's profit. Given these results, the following policy implication would be immediate:

Corollary 1 *Complete trade and investment liberalization together with the strategic use of a consumer welfare argument in regulating foreign market entry and the corresponding minimum output requirement as defined by Condition 1 will not hurt the host country insofar as there is also multinational competition for foreign acquisition.*

Similar to Norbäck and Persson (2007) and Koska (2019), it can be argued that it would not be optimal for the host country to ban foreign acquisition and permit trade or greenfield entry. This is also the empirically relevant case as reported by UNCTAD (2000). Additionally, the results suggest that the host country might opt for complete liberalization and strategically use a consumer welfare argument in regulating foreign market entry, by imposing a minimum output requirement for foreign acquisition given by Condition 1. This holds not only for any permissible trade or greenfield entry, but also for some cases where independent foreign sales decrease local welfare relative to local monopoly. That is, the host country might still consider liberalizing the market and using the consumer-surplus standard strategically so as to lead multinationals to compete for preemptive foreign acquisition.

5   Concluding remarks

In a simple oligopolistic market entry model, this study has scrutinized the implications of multinational competition for cross-border firm acquisition (for which there is a minimum output requirement warranted by the strategic use of a consumer welfare argument in regulating foreign market entry) on multinationals' foreign market entry behavior and on local welfare. The results have shown that when strategically using a consumer welfare argument in regulating foreign market

entry, the host country is not hurt, but can gain substantially in terms of welfare, especially when there is also multinational competition for foreign acquisition. In particular, this study has shown that cross-border firm acquisition may emerge as an equilibrium foreign market entry mode even when it is less profitable than trade or greenfield entry in the times of complete liberalization (which is expected to be the case especially when there is fierce multinational competition for foreign acquisition). By strategically using a consumer welfare argument in regulating foreign market entry, and thus by allowing for foreign market entry and imposing a minimum output requirement for foreign acquisition, the host country can lead multinationals to compete for foreign acquisition for purely preemptive reasons. The outcome of this is not only higher consumer welfare, but also a significantly high acquisition price improving welfare relative to the monopoly case, to trade, and to greenfield entry.

There are different avenues by which this paper can be extended. For instance, some non-prohibitive trade and investment costs can be included in the model. In such a case, the multinationals' outside options will be determined by the proximity-concentration trade-off as detailed in Section 1. All the results will then follow. By the same token, the model has assumed a single local firm for simplicity. It is also rather straightforward to extend the model to local competition prior to market entry of foreign firms. The results are not sensitive to this assumption. As is already mentioned in Section 1, in Koska (2019), there is, to some extent, local competition, although there is only one foreign firm entering the host country. In contrast, this paper focuses on multinational competition for foreign acquisition of a local firm. Norbäck and Persson (2008) take both types of competition on board (and they consider an oligopolistic market structure), although they do not consider a minimum output requirement for acquisitions, nor do they look at welfare implications. Following both Koska (2019) and Norbäck and Persson (2008), under a minimum output requirement as detailed in this paper, it is straightforward to show that there is always a preemptive takeover so long as local firms are identical and foreign firms compete for acquisition of the same local firm. In such a case, the results still will qualify, though there will be some level effect, especially on outside profits and acquisition prices (firms' valuations). By contrast, introducing firm heterogeneity among local firms will complicate the model. The reason is that it is not clear whether the most (or the least) productive local firm will always be targeted for firm acquisition: for different constellations of parameter values different local firms may be targeted; see Pagnozzi and Rosato (2016) for the case of complete information, and Koska et al. (2018b) for the case of incomplete information. An interesting extension of the model, however, would be to relax the assumption of homogeneous goods. In the context that consumers love variety, this would warrant a modification of the consumer-welfare argument used strategically in regulating foreign market entry, and could generate some interesting welfare results. As such an extension deserves its own model, it is left to future research.

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