Online Supplement To

Export or Merge?
Proximity vs. Concentration in Product Space*

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Abstract

This Online Supplement documents equilibrium existence under parameter restrictions for the model in Muendler (2014).

*I thank Alan Spearot for generously sharing the sector-country-year aggregates of his global M&A transactions data. An early version of this manuscript circulated under the title "Market Access: Enter and Extract, or Merge and Match?" The author is also a member of CAGE.

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I Physical Fixed Entry Costs

Suppose both market entry with exports and horizontal foreign direct investment involve fixed costs of their own. A conventional assumption in theory is that horizontal FDI involves a fixed cost F_M that strictly exceeds the fixed cost of exporting F_E: $F_M > F_E$ (see e.g. Helpman et al. 2004). This fixed cost ranking is supported by empirical patterns of selection into exporting or FDI (see e.g. Bernard, Jensen and Schott 2009).

The market outcome will depend on net profits after accounting for the fixed costs of entry and merger. Entry with exports will be preferred if and only if

$$(\pi_I^* + \pi_E^*) - F_E \geq \pi_M^* - F_M \qquad \Leftrightarrow \qquad \pi_M^* - (\pi_I^* + \pi_E^*) \leq F_M - F_E. \tag{I.1}$$

This condition simply formalizes the unsurprising basic idea that cross-border mergers and acquisitions become more likely with globalization if fixed costs of horizontal FDI F_M decline faster than the fixed costs of export entry F_E.

II Equilibrium Existence under Parameter Restrictions

This appendix explores two extremes in the possible parameter range to illustrate existence of the according equilibria with foreign entry and under monopoly.

To fix ideas, set $\tau = F_E = 0$. An illustration for $\tau > 0$ would require the exploration of additional subcases but not substantively alter the insights. Similarly, under fixed entry costs, only the difference between F_M and F_E matters for the equilibrium outcome, so the normalization F_E is not restrictive. To illustrate possible market outcomes under the entry-versus-merger condition (I.1), consider two numeric examples at the extremes of possible λ_I and Λ combinations.

First suppose that $\lambda_I = .5$. Condition (7) then implies that $\Lambda \leq 3/11$ and $\sigma \geq 265/484$; set $\Lambda = 3/11$ and $\sigma = 265/484$. Note that $\sigma = 265/484$ is below the upper threshold for σ in range C ($265/484 < 3(\lambda_I)^2$), so market outcomes in any range from C to A of Table 1 are possible for the merger monopoly. The entrant can credibly threaten entry as long as the entrant's profit is weakly positive, $\pi_E^* \geq F_E = 0$. This is the case by (4). But duopoly profit after entry is only $(\pi_I^* + \pi_E^*) = (366/1331)t$, whereas monopoly profit after merger is $\pi_M^* = (530/3)^{2/3}(11)^{-4/3}t$. We therefore need to suppose that fixed costs of a merger F_M exceed

the difference ($F_M > (366/1331)t - (530/3)^{2/3}(11)^{-4/3}t$), otherwise entry never occurs. An immediate implication is that entry will only occur in lower σ ranges, such as C or B say, whereas merger might occur in any range. But for high merger fixed costs F_M, mergers will be observed in higher σ ranges, such as A say.

Next suppose that $\lambda_I = .25$. Note that this will result in another extreme of parameter choices because the model is symmetric in the sense that the labels entrant and incumbent can be interchanged. Applied to $\lambda_I \geq \lambda_E$, condition (7) requires that $11(1-\Lambda) - 10\lambda_I \geq 3$, which in turn implies that $\lambda_I \geq .25$. We map out the possible λ_I and Λ combinations as we move the incumbent's location in the lower half of the unit interval between one-quarter and one-half and simultaneously move the entrant's location in the upper half of the unit interval between three-quarters and one. For $\lambda_I = .25$, condition (7) implies that $\Lambda \leq 1/2$ and $\sigma \geq 9/16$; set $\Lambda = 1/2$ and $\sigma = 9/16$. Now duopoly profit after entry is $(\pi_I^* + \pi_E^*) = (1/2)t$, whereas monopoly profit after merger is $\pi_M^* = (3/2)^{2/3}t$—again strictly larger than duopoly profit under the stylized features of the Hotelling linear product space model. As before for the example of a high λ_I, at $\lambda_I = .25$ entry will only occur in lower σ ranges, such as C or B say, whereas merger might occur in any range. But for high merger fixed costs F_M, mergers will be observed in higher σ ranges, such as A say. In summary, a merger, and the resulting concentration of product offerings at a single point in product space, is therefore more likely to occur in a globalized product space where consumers are less sensitive to an additional entrant's variety differentiation.

References

Muendler, Marc-Andreas, "Export or Merge? Proximity vs. Concentration in Product Space," *Asia-Pacific Journal of Accounting & Economics*, 2014, forthcoming.

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