Online Appendix

A Nash Bargaining equilibrium

A.1 Assortment HL

Consider first the subgame where r_i has listed the assortment HL. There is a unique bilateral negotiation between r_i and l for both products. The retailer's profit when it succeeds in the negotiation is $\Pi^{HL} - F_{l,i}^{HL}$, while its status-quo profit in case of a breakdown is zero. The supplier's profit if the negotiation succeeds is $F_{l,i}^{HL}$, while its status-quo profit in case of a breakdown is zero.

The equilibrium outcome is derived from the bilateral Nash product (where the superscripts relate to the subgame equilibrium assortment on which we focus):

$$\max_{F_{l,i}^{HL}} (\Pi^{HL} - F_{l,i}^{HL})^{\alpha} (F_{l,i}^{HL})^{1-\alpha}$$
$$\Leftrightarrow (1-\alpha)(\Pi^{HL} - F_{l,i}^{HL}) = \alpha F_{l,i}^{HL}$$

Hence we have the following equilibrium values:

$$F_{l,i}^{HL} = (1-\alpha)\Pi^{HL}$$
$$\pi_{r_i,i}^{HL} = \Pi^{HL} - F_{l,1}^{HL} = \alpha \Pi^{HL}$$
$$\pi_{l,i}^{HL} = F_{l,i}^{HL} = (1-\alpha)\Pi^{HL}$$
$$\pi_{s_i,i}^{HL} = 0$$

A.2 Assortment XM

Consider now the subgames where retailer r_i sells product M, that is, assortment is XM, with $X \in \{H, L\}$. Retailer r_i engages in a simultaneous bilateral negotiation with each of the two suppliers listed.

The retailer now has a positive status-quo profit in the bargaining because it negotiates with two different suppliers. Retailer r_i engages in a bilateral negotiation with each listed supplier.

Consider the negotiation between r_i and l. The retailer's profit when it succeeds in both negotiations is $\Pi^{XM} - F^{XM}_{l,i} - F^{XM}_{s_i,i}$, while its status-quo profit in case of a breakdown is $\Pi^M - F^{XM}_{s_i,i}$. The supplier's profit if the negotiation succeeds is $F^{XM}_{l,i}$, while its status quo profit in case of a breakdown is zero.

Consider now the negotiation between r_i and s_i. The retailer's profit when it succeeds in both negotiations is $\Pi^{XM} - F^{XM}_{l,i} - F^{XM}_{s_i,i}$, while its status-quo profit in case of a breakdown is $\Pi^M - F^{XM}_{l,i}$. The supplier's profit if the negotiation succeeds is $F^{XM}_{s_i,i}$, while its status-quo profit in case of a breakdown is zero.

We solve the following Nash bargaining :

$$
\begin{aligned}
&\max_{F^{XM}_{l,i}} (\Pi^{XM} - F^{XM}_{s_i,i} - F^{XM}_{l,i} - (\Pi^M - F^{XM}_{s_i,i}))^{\alpha} (F^{XM}_{l,i})^{1-\alpha} \\
&\quad \Leftrightarrow (1-\alpha)(\Pi^{XM} - F^{XM}_{l,i} - F^{XM}_{s_i,i} - (\Pi^M - F^{XM}_{s_i,i})) = \alpha F^{XM}_{l,i} \\
&\max_{F^{XM}_{s_i,i}} (\Pi^{XM} - F^{XM}_{s_i,i} - F^{XM}_{l,i} - (\Pi^X - F^{XM}_{l,i}))^{\alpha} (F^{XM}_{s_i,i})^{1-\alpha} \\
&\quad \Leftrightarrow (1-\alpha)(\Pi^{XM} - F^{XM}_{l,i} - F^{XM}_{s_i,i} - (\Pi^M - F^{XM}_{l,i})) = \alpha F^{XM}_{s_i,i}
\end{aligned}
$$

Hence we have the following equilibrium values:

$$
\begin{aligned}
F^{XM}_{l,i} &= (1-\alpha)(\Pi^{XM} - \Pi^M) \\
\pi^{XM}_{r_i,i} &= \Pi^{XM} - F^{XM}_{l,i} - F^{XM}_{s_i,i} = (1-\alpha)(\Pi^X + \Pi^M) + (-1+2\alpha)\Pi^{XM} \\
\pi^{XM}_{l,i} &= F^{XM}_{l,i} = (1-\alpha)(\Pi^{XM} - \Pi^M) \\
\pi^{XM}_{s_i,i} &= F^{XM}_{s_i,i} = (1-\alpha)(\Pi^{XM} - \Pi^X)
\end{aligned}
$$

If instead s_j supplies M we assume that the fixed export cost is sunk and therefore the above stage-2 equilibrium gross profit are unchanged.

A.3 Assortment X

Consider now the subgames where retailer r_i sells product X with $X \in \{H, M, L\}$. Retailer r_i engages in a bilateral negotiation with its unique supplier.

The retailer's profit when it succeeds in this negotiation is $\Pi^X - F^X_{k,i}$, while its status-quo profit in case of a breakdown is zero. The supplier's profit if the negotiation succeeds is $F^X_{k,i}$ while its status-quo profit in case of a breakdown is zero. The resolution of the Nash bargaining is as follows:

$$\max_{F^X_{k,i}} (\Pi^X - F^X_{k,i})^\alpha (F^X_{k,i})^{1-\alpha}$$
$$\Leftrightarrow (1-\alpha)(\Pi^X - F^X_{k,i}) = \alpha F^X_{k,i}$$

Hence we have the following equilibrium values:

$$F^X_{k,i} = (1-\alpha)\Pi^X$$
$$\pi^X_{r_i,i} = \Pi^X - F^X_{k,i} = \alpha \Pi^X$$
$$\pi^X_{k,i} = F^{XM}_{l,i} = (1-\alpha)\Pi^X$$

A.4 Proof lemma 1

Lemma 1 states that under Assumptions 1-3 firms' profits gross of slotting fees can be ranked as follows:

$$\pi^{HM}_{r_i,i} \geq \max\{\pi^{HL}_{r_i,i}, \pi^{ML}_{r_i,i}\}, \text{ and } \min\{\pi^{HL}_{r_i,i}, \pi^{ML}_{r_i,i}\} \geq \pi^H_{r_i,i} \geq \pi^M_{r_i,i} \geq \pi^L_{r_i,i} \geq 0$$
$$\pi^{HL}_{l,i} \geq \pi^H_{l,i} \geq \max\{\pi^{HM}_{l,i}, \pi^L_{l,i}\}, \text{ and } \min\{\pi^{HM}_{l,i}, \pi^L_{l,i}\} \geq \pi^{ML}_{l,i} \geq 0$$
$$\pi^M_{s_i,i} \geq \pi^{ML}_{s_i,i} > \pi^{HM}_{s_i,i} \geq 0;$$

Under Assumption 3, on each market, supplier l sells product H and L and supplier s_i sells product M. We compare continuation profits obtained in stage 2 for each assortment.

- $\pi^{HM}_{r_i,i} \geq \max\{\pi^{HL}_{r_i,i}, \pi^{ML}_{r_i,i}\}$ & $\min\{\pi^{HL}_{r_i,i}, \pi^{ML}_{r_i,i}\} \geq \pi^H_{r_i,i} \geq \pi^M_{r_i,i} \geq \pi^L_{r,i} \geq 0$

- $\pi^{HM}_{r_i,i} - \pi^{HL}_{r_i,i} = \alpha(\Pi^{HM} - \Pi^{HL}) + (1-\alpha)(\Pi^{H} + \Pi^{M} - \Pi^{HM}) \geq 0$ because $\Pi^{HM} - \Pi^{HL} > 0$ under Assumption 1 and $\Pi^{H} + \Pi^{M} - \Pi^{HM} > 0$ under Assumption 2.
- $\pi^{HM}_{r_i,i} - \pi^{ML}_{r_i,i} = \alpha(\Pi^{HM} - \Pi^{ML}) + (1-\alpha)(\Pi^{ML} - \Pi^{L} - (\Pi^{HM} - \Pi^{H})) \geq 0$ because $\Pi^{HM} - \Pi^{ML} > 0$ under Assumption 1 and $(\Pi^{ML} - \Pi^{L} - (\Pi^{HM} - \Pi^{H}))$ under Assumption 4.
- Under assumption 1 it is straightforward that $\pi^{HL}_{r_i,i} \geq \pi^{H}_{r_i,i} \geq \pi^{M}_{r_i,i} \geq \pi^{L}_{r,i} \geq 0$. Moreover $\pi^{ML}_{r_i,i} - \pi^{H}_{r_i,i} = \alpha(\Pi_{ML} - \Pi_{H}) + (1-\alpha)(\Pi^{M} + \Pi^{L} - \Pi^{ML}) \geq 0$ because $\Pi^{ML} - \Pi^{H} > 0$ under Assumption 1 and $\Pi^{M} + \Pi^{L} - \Pi^{ML} > 0$ under Assumption 2.

- Second, $\pi^{HL}_{l,i} \geq \pi^{H}_{l,i} \geq \max\{\pi^{HM}_{l,i}, \pi^{L}_{l,i}\} \geq \pi^{ML}_{l,i} \geq 0$
  - $\pi^{HL}_{l,i} - \pi^{H}_{l,i} = (1-\alpha)(\Pi^{HL} - \Pi^{H}) \geq 0$ under Assumption 1.
  - $\pi^{H}_{l,i} - \pi^{HM}_{l,i} = (1-\alpha)(\Pi^{H} - (\Pi^{HM} - \Pi^{H})) \geq 0$. Under Assumption 2, $\Pi^{HM} - \Pi^{H} < \Pi^{M}$, and under Assumption 1, $\Pi^{H} > \Pi^{M}$. $\pi^{H}_{l,i} - \pi^{L}_{l,i} = (1-\alpha)(\Pi^{H} - \Pi^{L}) \geq 0$ under Assumption 1.
  - $\pi^{HM}_{l,i} - \pi^{ML}_{l,i} = (1-\alpha)(\Pi^{HM} - \Pi^{ML} > 0)$ under Assumption 1. $\pi^{L}_{l,i} - \pi^{ML}_{l,i} = (1-\alpha)(\Pi^{L} - (\Pi^{ML} - \Pi^{M}) > 0)$ under Assumption 2.

- Third, $\pi^{M}_{s_i,i} \geq \pi^{ML}_{s_i,i} \geq \pi^{HM}_{s_i,i} \geq 0$.
  - $\pi^{M}_{s_i,i} - \pi^{ML}_{s_i,i} = (1-\alpha)(\Pi^{M} - (\Pi^{ML} - \Pi^{L}) \geq 0$ under Assumption 2.
  - $\pi^{ML}_{s_i,i} - \pi^{HM}_{s_i,i} = (1-\alpha)((\Pi^{ML} - \Pi^{L}) - (\Pi^{HM} - \Pi^{H}))) \geq 0$ under Assumption 4.

B Proof of lemma 2

(i) Under Assumptions 1 - 4, retailers always prefer to list two products. Indeed, lemma 1 shows that listing any combination of two products (weakly) increases retailers' profit gross of slotting fees as compared to listing only one product. Moreover, for any menu of slotting fees, listing two products (weakly) increases slotting-fees paid by suppliers as slotting fees are not conditional on the other suppliers' product listed.

(ii) Under Assumptions 1 - 4, for any alliance strategy, supplier l is never willing to pay a positive slotting fee to sell only one product.

- **Absent buying group** Assume that r_i decides to list M. From lemma 2 *(i)* it then chooses between listing HM or ML, hence supplier l knows that one of its products is listed for sure. From lemma 1, in the continuation equilibrium supplier l obtains a higher gross profit with the assortment HM than with ML and is thus not wiling to pay a positive fee for L to be listed. Besides, under Assumptions 2 and 3, in the continuation equilibrium r_i also obtains a higher gross profit with the assortment HM. Hence, l does not need to pay a positive slotting fee to convince the retailer to list product H because their incentives are aligned.

- **With a partial/full buying group** Whenever the buying group decides to list M, it must choose to list the assortment HM on one market and ML on the other. Under Assumption 1, l makes a higher gross profit by selling the two products H and L in both markets rather than by selling only one product on each market. Hence, it is never profitable for l to pay a positive slotting fee for selling only one product. Furthermore, it is not willing to pay a positive fee to convince the buying group to choose one product rather than the other, because it obtains the same profit regardless of the product that is selected (A or C).

C Equilibrium absent buying group

Under Assumptions 1-4, absent buying group, in equilibrium the efficient assortment HM is sold on each market (*i.e.* AB in market 1 and BC in market 2), the retailer accepts the corresponding slotting fees.[1]

[1]Note that in stage 1, there is a continuum of profiles of slotting fees that sustain an equilibrium where both suppliers offer higher fees and the retailer selects the assortment HM. This profile is selected by trembling-hand perfection. All equilibria display the same assortment HM.

Equilibrium slotting fee offers are: $\overline{S}_{s_i,i} = \max\{\pi^{HL}_{r_i,i} - \pi^{HM}_{r_i,i} + \overline{V}_{l,i}, \overline{V}_{s_j,i}, 0\}$, $\overline{S}_{s_j,i} = \max\{\overline{V}_{s_j,i}, 0\}$ and $\overline{S}_{l,i} \equiv \big(0, 0, \overline{V}_{l,i}\big)$

$$\overline{S}_{s_i,i} \equiv \begin{cases} (\Pi^{HL} - \Pi^{H}) - \alpha(\Pi^{HM} - \Pi^{H}) & \text{if } \alpha \leq \overline{\alpha}_1 \textit{ and } E \geq \Pi^{HM} - \Pi^{HL} \\ (1-\alpha)(\Pi^{HM} - \Pi^{H}) - E & \text{if } \alpha \leq \overline{\alpha}_2 \textit{ and } E \leq \Pi^{HM} - \Pi^{HL} \\ 0 & \text{otherwise} \end{cases}$$

$$\overline{S}_{s_j,i} \equiv \begin{cases} (1-\alpha)(\Pi^{HM} - \Pi^{H}) - E & \text{if } \alpha \leq \overline{\alpha}_2 \textit{ and } E \leq \Pi^{HM} - \Pi^{HL} \\ 0 & \text{otherwise} \end{cases}$$

$$\overline{S}_{l,i} \equiv \big(0, 0, (1-\alpha)(\Pi^{HL} - \Pi^{HM} + \Pi^{M})\big)$$

with $\overline{\alpha}_1 \equiv \frac{\Pi^{HL} - \Pi^{H}}{\Pi^{HM} - \Pi^{H}}, \overline{\alpha}_2 \equiv \frac{\Pi^{HM} - \Pi^{H} - E}{\Pi^{HM} - \Pi^{H}}$.

Equilibrium profits are: $\overline{\Pi}_{r_i,i} = \max\{\pi^{HL}_{r_i,i} + \overline{V}_{l,i}, \pi^{HM}_{r_i,i} + \overline{V}_{s_j,i}, \pi^{HM}_{r_i,i}\}$, $\overline{\Pi}_{s_i,i} = \min\{\pi^{HM}_{s_i,i} - (\pi^{HL}_{r_i,i} - \pi^{HM}_{r_i,i} + \overline{V}_{l,i}), \pi^{HM}_{s_i,i} - \overline{V}_{s_j,i}, \pi^{HM}_{s_i,i}\}$ and $\overline{\Pi}_{l,i} = \pi^{HM}_{l,i}$.

$$\overline{\Pi}_{r_i,i} \equiv \begin{cases} \overline{\Pi}^1_{r_i} = \Pi^{HL} - (1-\alpha)(\Pi^{HM} - \Pi^{M}) & \text{if } \alpha \leq \overline{\alpha}_1 \textit{ and } E \geq \Pi^{HM} - \Pi^{HL} \\ \overline{\Pi}^2_{r_i} = \Pi^{HM} - (1-\alpha)(\Pi^{HM} - \Pi^{M}) - E & \text{if } \alpha \leq \overline{\alpha}_2 \textit{ and } E \leq \Pi^{HM} - \Pi^{HL} \\ \overline{\Pi}^3_{r_i} = \Pi^{HM} - (1-\alpha)\big[(\Pi^{HM} - \Pi^{H}) + (\Pi^{HM} - \Pi^{M})\big] & \text{otherwise} \end{cases}$$

$$\overline{\Pi}_{s_i,i} \equiv \begin{cases} \Pi^{HM} - \Pi^{HL} & \text{if } \alpha \leq \overline{\alpha}_1 \textit{ and } E \geq \Pi^{HM} - \Pi^{HL} \\ E & \text{if } \alpha \leq \overline{\alpha}_2 \textit{ and } E \leq \Pi^{HM} - \Pi^{HL} \\ (1-\alpha)(\Pi^{HM} - \Pi^{H}) & \text{otherwise} \end{cases}$$

$$\overline{\Pi}_{s_j,i} \equiv 0$$

$$\overline{\Pi}_{l,i} \equiv (1-\alpha)(\Pi^{HM} - \Pi^{M})$$

D Equilibrium with a partial buying group

D.1 Characterization of the equilibrium

Under Assumptions 1-4, with a partial buying group complete efficiency never arises in equilibrium. Two types of equilibria may arise:

Equilibrium with exclusion when $2\Pi^{HL} > \Pi^{HM} + \Pi^{ML}$, the retailers choose to list the two products of the large supplier (the assortment is AC) and thus exclude small suppliers in both markets. Small suppliers offer $\widehat{S}^e_{s_i,i} = \pi^{HM}_{s_i,i}$ and $\widehat{S}^e_{s_j,j} = \pi^{ML}_{s_j,j}$ and the large supplier offers $\widehat{S}^e_l \equiv \max\{\pi^{HM}_{r_i,i} + \pi^{ML}_{r_i,i} - 2\pi^{HL}_{r_i,i} + \widehat{S}^e_{s_i,i} + \widehat{S}^e_{s_j,j}, 0\}$.

Equilibrium slotting fees:

- The large supplier may offer a positive slotting fee only to have its two products listed:

$$\widehat{S}^e_l \equiv \begin{cases} \alpha(\Pi^{HM} + \Pi^{ML} - 2\Pi^{HL}) + 2(1-\alpha)\Pi^M \; if \; \alpha \leq \widehat{\alpha}^e \\ 0 \; if \; \alpha > \widehat{\alpha}^e \end{cases}$$

- The two small suppliers offer:[2]

$$\widehat{S}^e_{s_i,i} \equiv (1-\alpha)(\Pi^{HM} - \Pi^H), \text{ and } \widehat{S}^e_{s_j,i} \equiv \max\{(1-\alpha)(\Pi^{HM} - \Pi^H) - E, 0\} \text{ in market } i$$
$$\widehat{S}^e_{s_i,j} \equiv \max\{(1-\alpha)(\Pi^{ML} - \Pi^L) - E, 0\} \text{ and } \widehat{S}^e_{s_j,j} \equiv (1-\alpha)(\Pi^{ML} - \Pi^L) \text{ in market } j$$

The resulting total profits in both markets are such that $\widehat{\Pi}^e_r = \max\{\pi^{HM}_{r_i,i} + \pi^{ML}_{r_i,i} + \widehat{S}^e_{s_i,i} + \widehat{S}^e_{s_j,j}, 2\pi^{HL}_{r_i,i}\}$, $\widehat{\Pi}^e_{s_i} = 0$ and $\widehat{\Pi}^e_l = \min\{\Pi^{HL} - \pi^{HM}_{r_i,i} - \pi^{ML}_{r_i,i} - \widehat{S}^e_{s_i,i} - \widehat{S}^e_{s_j,j}, 2\pi^{HL}_{l,i}\}$

[2]Again, we select this equilibrium among a continuum by the trembling-hand criterion.

$$
\begin{aligned}
\widehat{\Pi}_r^e &\equiv \begin{cases} \widehat{\Pi}_r^1 = \alpha(\Pi^{HM} + \Pi^{ML}) + 2(1-\alpha)\Pi^M & \text{if } \alpha \leq \widehat{\alpha}^e \\ \widehat{\Pi}_r^2 = 2\alpha\Pi^{HL} & \text{if } \alpha > \widehat{\alpha}^e \end{cases} \\
\widehat{\Pi}_s^e &= \widehat{\Pi}_{s_1,1}^e \equiv \widehat{\Pi}_{s_2,2}^e = 0 \qquad (1) \\
\widehat{\Pi}_l^e &\equiv \begin{cases} \alpha 2\Pi^{HL} - \alpha(\Pi^{HM} + \Pi^{ML}) - 2(1-\alpha)\Pi^M & \text{if } \alpha \leq \widehat{\alpha}^e \\ 2(1-\alpha)\Pi^{HL} & \text{if } \alpha > \widehat{\alpha}^e \end{cases}
\end{aligned}
$$

With $\widehat{\alpha}^e \equiv \frac{2\Pi^M}{2\Pi^{HL} - \Pi^{HM} - \Pi^{ML} + 2\Pi^M}$.

Equilibrium without exclusion of the local small suppliers: when $\Pi^{HM} + \Pi^{ML} \geq 2\Pi^{HL}$, there are two mirror equilibria where the retailers list the product of the local small supplier with one product of the large supplier (the assortment is either AB or BC in both markets). Let's consider that the product listed of the large supplier is H in market i and L in market j.

Equilibrium slotting fees:

- The large supplier offers its maximum willingness to pay to impose its two products in the two markets:[3]
  $\widehat{S}_l^{ne} \equiv \widehat{V}_{l,1} + \widehat{V}_{l,2} \equiv (1-\alpha)(2\Pi^{HL} - \Pi^{HM} - \Pi^{ML} + 2\Pi^M)$.

- Small suppliers offers are such that:
  $\widehat{S}_{s_j,i} \equiv \widehat{V}_{s_j,i} \leq \widehat{S}_{s_i,i}^{ne} \leq \widehat{V}_{s_i,i}$ and $\widehat{S}_{s_i,j} \equiv \widehat{V}_{s_i,j} \leq \widehat{S}_{s_i,j}^{ne} \leq \widehat{V}_{s_j,j}$ and,

$$
\widehat{S}_{s_1,1}^{ne} + \widehat{S}_{s_2,2}^{ne} \equiv \begin{cases} 2\Pi^{HL} - (1-\alpha)(\Pi^H + \Pi^L) - \alpha(\Pi^{HM} + \Pi^{ML}) & \text{if } E \geq \max\{\widehat{E}_1, \widehat{E}_2\} \text{ and } \alpha \leq \widehat{\alpha}_1 \\ (1-\alpha)(\Pi^{ML} - \Pi^L) - E & \text{if } \widehat{E}_3 \leq E \leq \widehat{E}_2 \text{ and } \alpha \leq \widehat{\alpha}_2 \\ (1-\alpha)(\Pi^{HM} - \Pi^H + \Pi^{ML} - \Pi^L) - 2E & \text{if } E \leq \min\{\widehat{E}_1, \widehat{E}_3\} \text{ and } \alpha \leq \widehat{\alpha}_3 \\ 0 & \text{otherwise} \end{cases}
$$

[3] The large supplier offer to have only one product listed (A or C) is zero.

$$\widehat{\Pi}_r^{ne} \equiv \begin{cases} \widehat{\Pi}_r^3 = 2\Pi^{HL} - (1-\alpha)(\Pi^{HM} + \Pi^{ML} - 2\Pi^M) & \text{if } E \geq \max\{\widehat{E}_1, \widehat{E}_2\} \text{ and } \alpha \leq \widehat{\alpha}_1 \\ \widehat{\Pi}_r^4 = \alpha(\Pi^{HM} + \Pi^{ML}) + 2(1-\alpha)\Pi^M - (1-\alpha)(\Pi^{HM} - \Pi^H) - E & \text{if } \widehat{E}_3 \leq E \leq \widehat{E}_2 \text{ and } \alpha \leq \widehat{\alpha}_2 \\ \widehat{\Pi}_r^5 = -2E + \alpha(\Pi^{HM} + \Pi^{ML}) + 2(1-\alpha)\Pi^M & \text{if } E \leq \min\{\widehat{E}_1, \widehat{E}_3\} \text{ and } \alpha \leq \widehat{\alpha}_3 \\ \widehat{\Pi}_r^6 = (1-\alpha)(\Pi^H + \Pi^L + 2\Pi^M) - (2\alpha - 1)(\Pi^{HM} + \Pi^{ML}) & \text{otherwise} \end{cases}$$

$$\widehat{\Pi}_s^{ne} \equiv \begin{cases} \Pi^{HM} + \Pi^{ML} - 2\Pi^{HL} & \text{if } E \geq \max\{\widehat{E}_1, \widehat{E}_2\} \text{ and } \alpha \leq \widehat{\alpha}_1 \\ (1-\alpha)(\Pi^{HM} - \Pi^H) + E & \text{if } \widehat{E}_3 \leq E \leq \widehat{E}_2 \text{ and } \alpha \leq \widehat{\alpha}_2 \\ 2E & \text{if } E \leq \min\{\widehat{E}_1, \widehat{E}_3\} \text{ and } \alpha \leq \widehat{\alpha}_3 \\ (1-\alpha)((\Pi^{HM} - \Pi^H) + (\Pi^{ML} - \Pi^L)) & \text{otherwise} \end{cases}$$

$$\widehat{\Pi}_l^{ne} \equiv (1-\alpha)(\Pi^{HM} + \Pi^{ML} - 2\Pi^M)$$

Resulting profits are:

with $\widehat{E}_1 \equiv \frac{\Pi^{HM}+\Pi^{ML}-2\Pi^{HL}}{2}$, $\widehat{E}_2 \equiv (1-\alpha)\Pi^H + \alpha\Pi^{HM} + \Pi^{ML} - 2\Pi^{HL}$, $\widehat{E}_3 \equiv (1-\alpha)(\Pi^{HM} - \Pi^H)$, $\widehat{\alpha}_1 \equiv \frac{2\Pi^{HL}-\Pi^H-\Pi^L}{\Pi^{HM}-\Pi^H+\Pi^{ML}-\Pi^L}$, $\widehat{\alpha}_2 \equiv 1 - \frac{E}{\Pi^{ML}-\Pi^L}$ $\widehat{\alpha}_3 \equiv 1 - \frac{2E}{\Pi^{HM}-\Pi^H+\Pi^{ML}-\Pi^L}$.

D.2 Profitability of a partial buying group (Proof of Proposition 3)

First, note that because a partial buying group leads to listing inefficiency it can be profitable only if the threat of replacement is active (*i.e.* equilibrium slotting fees are positive).

- When $\Pi^{HM} + \Pi^{ML} \leq 2\Pi^{HL}$, the listing decision is (HM, HM) without buying group and (HL, HL) with a partial buying group. A partial buying group can be profitable only if the equilibrium slotting fee is positive, that is: $\alpha \leq \widehat{\alpha}^e$.
  - if $E \geq \Pi^{HM} - \Pi^{ML}$ the threat of replacement absent buying group comes from l.
    - When $\alpha < \overline{\alpha}_1$, this threat of replacement is binding. The partial buying group is profitable when: $\widehat{\Pi}_r^1 > 2\overline{\Pi}_{r_i}^1 \Leftrightarrow \alpha < \frac{2(\Pi^{HM}-\Pi^{HL})}{\Pi^{HM}-\Pi^{ML}}$.
    - When $\alpha \geq \overline{\alpha}_1$ there is no slotting fee paid absent buying group. The partial buying group is profitable when: $\widehat{\Pi}_r^1 > 2\overline{\Pi}_{r_i}^3 \Leftrightarrow \alpha < \frac{2(\Pi^{HM}-\Pi^H)}{3\Pi^{HM}-2\Pi^H-\Pi^{ML}}$.

It is straightforward that $\frac{2(\Pi^{HM}-\Pi^{HL})}{\Pi^{HM}-\Pi^{ML}} < \frac{2(\Pi^{HM}-\Pi^{H})}{3\Pi^{HM}-2\Pi^{H}-\Pi^{ML}} \Leftrightarrow \alpha < \overline{\alpha}_1$.

To sum-up if $\alpha \leq \min\{\frac{2(\Pi^{HM}-\Pi^{HL})}{\Pi^{HM}-\Pi^{ML}}, \frac{2(\Pi^{HM}-\Pi^{H})}{3\Pi^{HM}-2\Pi^{H}-\Pi^{ML}}\}$ the partial buying group is profitable and leads to exclusion of small suppliers. Otherwise, partial buying group is not profitable.

- if $E < \Pi^{HM} - \Pi^{ML}$, the threat of replacement absent buying group comes from the small foreign supplier.
  - When $\alpha < \overline{\alpha}_2$ this threat is binding. The partial buying group is profitable when $\widehat{\Pi}^1_r > 2\overline{\Pi}^2_{r_i} \Leftrightarrow \alpha < \frac{2E}{\Pi^{HM}-\Pi^{ML}}$.
  - There is no slotting fee when $\alpha \geq \overline{\alpha}_2$. In that case, the partial buying group is profitable when $\widehat{\Pi}^1_r > 2\overline{\Pi}^3_{r_i} \Leftrightarrow \alpha < \frac{2(\Pi^{HM}-\Pi^{H})}{3\Pi^{HM}-2\Pi^{H}-\Pi^{ML}}$.

  It is straightforward that $\frac{2E}{\Pi^{HM}-\Pi^{ML}} < \frac{2(\Pi^{HM}-\Pi^{H})}{3\Pi^{HM}-2\Pi^{H}-\Pi^{ML}} \Leftrightarrow \alpha < \overline{\alpha}_2$. To sum-up if $\alpha \leq \min\{\frac{2E}{\Pi^{HM}-\Pi^{ML}}, \frac{2(\Pi^{HM}-\Pi^{H})}{3\Pi^{HM}-2\Pi^{H}-\Pi^{ML}}\}$ the partial buying group is profitable and leads to exclusion of small suppliers. Otherwise, no buying group is created.

To sum-up when $\Pi^{HM} + \Pi^{ML} \leq 2\Pi^{HL}$, the partial buying is profitable for

$$\alpha \leq \min\{\frac{2E}{\Pi^{HM}-\Pi^{ML}}, \frac{2(\Pi^{HM}-\Pi^{H})}{3\Pi^{HM}-2\Pi^{H}-\Pi^{ML}}, \frac{2(\Pi^{HM}-\Pi^{HL})}{\Pi^{HM}-\Pi^{ML}}\},$$

and it is not profitable otherwise.

- When $\Pi^{HM}+\Pi^{ML} \geq 2\Pi^{HL}$, a necessary condition for the buying group to be profitable is that slotting fees must be positive.
  - If $E > \Pi^{HM} - \Pi^{ML}$, it is straightforward that $E > \max\{\widehat{E}_1, \widehat{E}_2\}$. Absent buying group and with partial buying group, the threat of replacement comes from the large supplier.
    - When $\alpha < \overline{\alpha}_1$ this threat of replacement is binding in the absence of buying groups. The partial buying group is always profitable because $\widehat{\Pi}^3_r > 2\overline{\Pi}^1_{r_i}$ is always satisfied.

* When $\alpha \geq \overline{\alpha}_1$, there is no slotting fee in the absence of buying group. The partial buying group is profitable when $\widehat{\Pi}_r^3 > 2\overline{\Pi}_{r_i}^3 \Leftrightarrow \alpha < \frac{\Pi^{HM}+2\Pi^{HL}-2\Pi^{H}-\Pi^{ML}}{3\Pi^{HM}-2\Pi^{H}-\Pi^{ML}}$.

- If $\Pi^{HM} - \Pi^{ML} > E > \max\{\widehat{E}_1, \widehat{E}_2\}$, with a partial buying group the threat of replacement comes from the large supplier. Absent buying group the threat of replacement comes from the foreign small suppliers.

  * When $\alpha < \overline{\alpha}_2$, the threat of replacement is active without buying group. In that case the partial buying group is profitable when $\widehat{\Pi}_r^4 > 2\overline{\Pi}_{r_i}^2 \Leftrightarrow \alpha < \frac{2E+2\Pi^{HL}-\Pi^{HM}-\Pi^{ML}}{\Pi^{HM}-\Pi^{ML}}$.
  * When $\alpha \geq \overline{\alpha}_2$, there is no slotting fee without buying group. The partial buying group is profitable when $\widehat{\Pi}_r^4 > 2\overline{\Pi}_{r_i}^2 \Leftrightarrow \alpha < \frac{2\Pi^{H}-2\Pi^{HL}-\Pi^{HM}+\Pi^{ML}}{2\Pi^{H}-3\Pi^{HM}+\Pi^{ML}}$.

  It is straightforward that $\frac{2E+2\Pi^{HL}-\Pi^{HM}-\Pi^{ML}}{\Pi^{HM}-\Pi^{ML}} < \frac{2\Pi^{H}-2\Pi^{HL}-\Pi^{HM}+\Pi^{ML}}{2\Pi^{H}-3\Pi^{HM}+\Pi^{ML}} \Leftrightarrow \alpha < \overline{\alpha}_2$. To sum-up if $\alpha \leq \min\{\frac{2E+2\Pi^{HL}-\Pi^{HM}-\Pi^{ML}}{\Pi^{HM}-\Pi^{ML}}, \frac{\Pi^{HM}-2\Pi^{H}+2\Pi^{HL}-\Pi^{ML}}{3\Pi^{HM}-2\Pi^{H}-\Pi^{ML}}\}$ the partial buying group is profitable and leads to exclusion of small suppliers. Otherwise, no buying group is created.

- If $\widehat{E}_3 < E \leq \widehat{E}_2$ then $\alpha > \overline{\alpha}_2$ and there is no slotting fees absent buying group. With a partial buying group, the threat of replacement comes only from the foreign small supplier with assortment ML. A partial buying group could be profitable for $\widehat{\Pi}_r^5 > 2\overline{\Pi}_{r_i}^2 \Leftrightarrow \alpha < \frac{\Pi^{HM}-\Pi^{H}-E}{2\Pi^{HM}-\Pi^{H}-\Pi^{ML}}$. However, it is straightforward to show that $\frac{\Pi^{HM}-\Pi^{H}-E}{2\Pi^{HM}-\Pi^{H}-\Pi^{ML}} < \overline{\alpha}_2$ and therefore a partial buying group is never profitable.

- If $E \leq \min\{\widehat{E}_1, \widehat{E}_3\}$ then $\alpha < \overline{\alpha}_2$ and there is no slotting fees absent buying group. With a partial buying group the threat of replacement comes from the small suppliers trying to exports their products. However it is straightforward to show that a buying group is never profitable in that case.

To sum-up when $\Pi^{HM}+\Pi^{ML} > 2\Pi^{HL}$ a buying group is profitable when $E > \max\{\widehat{E}_1, \widehat{E}_2\}$ and when $\alpha \leq \min\{\frac{2E+2\Pi^{HL}-\Pi^{HM}-\Pi^{ML}}{\Pi^{HM}-\Pi^{ML}}, \frac{\Pi^{HM}-2\Pi^{H}+2\Pi^{HL}-\Pi^{ML}}{3\Pi^{HM}-2\Pi^{H}-\Pi^{ML}}\}$.

D.3 Effect of a partial buying group on suppliers profit (Proof of Proposition 4).

To asses the effect of a profitable buying group on suppliers profit we have to consider the two possible assortments (HL, HL) and (HM, ML).

Recall that, without buying group, the equilibrium assortment is (HM, HM), the local small suppliers are listed and may have to pay a positive slotting fee. Retailers' joint profit can be written as the difference between the industry profit and suppliers' profit:

$$\overline{\Pi}_r = \Pi^{HM} + \Pi^{HM} - (\pi_l^{HM} + \pi_l^{HM}) - \overline{\Pi}_s$$
$$\Leftrightarrow \overline{\Pi}_r = 2(\alpha\Pi^{HM} - (1-\alpha)\Pi^M) - \overline{\Pi}_s$$

Consider first a profitable partial buying group with assortment (HM, ML). In this case slotting fee(s) are paid by the small suppliers, retailers' joint profit can be written as:

$$\widehat{\Pi}_r^{ne} = \Pi^{HM} + \Pi^{ML} - (\pi_l^{HM} + \pi_l^{ML}) - \widehat{\Pi}_s$$
$$\Leftrightarrow \widehat{\Pi}_r^{ne} = \alpha(\Pi^{HM} + \Pi^{ML}) - 2(1-\alpha)\Pi^M - \widehat{\Pi}_s$$

We have $\widehat{\Pi}_r^{ne} > \overline{\Pi}_r \Leftrightarrow \alpha(\Pi^{ML} - \Pi^{HM}) + (\widehat{\Pi}_s - \overline{\Pi}_s) > 0$. From Assumption 4 $\Pi^{ML} - \Pi^{HM} < 0$, hence small suppliers' joint profit must be negatively affected if the partial buying group is profitable. Moreover, it is straightforward that the large supplier is negatively affected because it sells an inefficient product on one of the two markets.

Consider now the case of a partial buying group with assortment (HL, HL). Small suppliers are excluded, hence it is straightforward their profit is reduced. Large supplier have their two products listed but obtain a lower profit than absent buying group. Indeed, without buying group, the minimum fee they have to pay to impose their two products is lower than with a partial buying group and they prefer to sell only one product.

E Equilibrium with a full buying group

E.1 Maximum willingness to pay of suppliers in Stage 1

- In market 1, the suppliers' willingness to pay are the same than with a partial buying group or without buying group, because the listing decisions are either HM or HL. Again, the large supplier is willing to impose the listing of product L too; the maximum amount it is ready to pay for this leaves him indifferent between the assortments HL and HM: $\widetilde{V}_{l,1} \equiv \pi_{l,1}^{HL} - \pi_{l,1}^{HM} = \widehat{V}_{l,1} = \overline{V}_{l,1}$. To ensure the listing of their product, the small suppliers are willing to pay up to $\widetilde{V}_{s_1,1} \equiv \pi_{s_1,1}^{HM} = \widehat{V}_{s_1,1} = \overline{V}_{s_1,1}$ and $\widetilde{V}_{s_2,1} \equiv \pi_{s_2,1}^{HM} - E = \widehat{V}_{s_2,1} = \overline{V}_{s_2,1}$.

- In market 2, the two competing listing decisions are unchanged compared to the situation with partial buying group (*i.e.* either ML or HL). The large supplier is willing to pay up to $\widetilde{V}_{l,2} \equiv \pi_{l,2}^{HL} - \pi_{l,2}^{ML} = \widehat{V}_{l,2} \geq \overline{V}_{l,2}$ to secure the assortment HL, while the local supplier s_2 is willing to pay up to $\widetilde{V}_{s_2,2} \equiv \pi_{s_2,2}^{ML} = \widehat{V}_{s_2,2} \geq \overline{V}_{s_2,2}$, and the foreign supplier s_1 up to $\widetilde{V}_{s_1,2} \equiv \pi_{s_1,2}^{ML} - E = \widehat{V}_{s_2,2} \geq \overline{V}_{s_2,2}$, to secure the product M in assortment ML.

E.2 Characterization of the equilibrium

Under Assumptions 1-4, with a full buying group complete efficiency never arises in equilibrium. Two types of equilibria may arise:

Equilibrium with exclusion: If $2\Pi^{HL} > \Pi^{HM} + \Pi^{ML} - E$, the retailers choose to list the two products of the large supplier (the assortment is (HL, HL)) and thus exclude the small suppliers in both markets. Each small supplier bids its willingness to pay to have its product listed in both markets: $\widetilde{S}_{s_i}^{e} = \widetilde{V}_{s_i,j} + \widetilde{V}_{s_i,i} \equiv \max\{\pi_{s_i,i}^{HM} + \pi_{s_i,j}^{ML} - E, 0\}$. To ensure that its two products are listed, the large supplier offers a fee that leaves the buying group with the outside option profit (listing a small supplier), that is $\widetilde{S}_{l}^{e} \equiv \max\{\pi_{r_i,i}^{HM} + \pi_{r_j,j}^{ML} - 2\pi_{r_i,i}^{HL} + \widetilde{S}_{s_i}^{e}, 0\}$. Consider now the equilibrium slotting fees:

- The large supplier may offer a positive slotting fee only to have its two products listed:

$$\widetilde{S}_l^e \equiv \begin{cases} \alpha(\Pi^{HM} + \Pi^{ML} - 2\Pi^{HL}) + 2(1-\alpha)\Pi^M - E \text{ if } \alpha \leq \widetilde{\alpha}^e \\ 0 \text{ if } \alpha > \widetilde{\alpha}^e \end{cases}$$

- Each small supplier offers:[4]

$$\widetilde{S}_{s_i}^e = \max\{(1-\alpha)(\Pi^{HM} + \Pi^{ML} - \Pi^M - \Pi^L) - E, 0\}$$

The resulting profits are such that $\widetilde{\Pi}_r^e = \max\{\pi_{r_i,i}^{HM} + \pi_{r_j,j}^{Ml} + \widetilde{S}_{s_i}^e, 2\pi_{r_i,i}^{HL}\}$, $\widetilde{\Pi}_{s_i}^e = 0$ and $\widetilde{\Pi}_l^e = \min\{2\Pi^{HL} - \pi_{r_i,i}^{HM} - \pi_{r_j,j}^{ML} - \widetilde{S}_s^e, 2\pi_{l,i}^{HL}\}$.

$$\widetilde{\Pi}_r^e \equiv \begin{cases} \widetilde{\Pi}_r^1 = 2(1-\alpha)\Pi^M + \alpha(\Pi^{ML} + \Pi^{HM}) - E \text{ if } \alpha \leq \widetilde{\alpha}^e \\ \widetilde{\Pi}_r^2 = 2\alpha\Pi^{HL} \text{ if } \alpha > \widetilde{\alpha}^e \end{cases}$$
$$\widetilde{\Pi}_s^e = \widetilde{\Pi}_{s_1}^e = \widetilde{\Pi}_{s_2}^e \equiv 0$$
$$\widetilde{\Pi}_l^e \equiv \begin{cases} 2\Pi^{HL} - 2(1-\alpha)\Pi^M - \alpha(\Pi^{HM} + \Pi^{ML}) + E \text{ if } \alpha \leq \widetilde{\alpha}^e \\ 2(1-\alpha)\Pi^{HL} \text{ if } \alpha > \widetilde{\alpha}^e \end{cases}$$

With, $\widetilde{\alpha}^e \equiv \frac{2\Pi^M - E}{2\Pi^{HL} - \Pi^{HM} - \Pi^{ML} + 2\Pi^M}$.

Equilibrium with a partial exclusion a local small supplier: When $\Pi^{HM} + \Pi^{ML} - E \geq 2\Pi^{HL}$, there are two mirror equilibria where the retailers list the product of a unique small supplier with one product of the large supplier (the assortment is either AB or BC in both markets). Let's consider that the product listed of the large supplier is H in market i and L in market j. Equilibrium slotting fees:

- The large supplier offers its maximum willingness to pay to impose its two products in

[4] we select the equilibrium among a continuum by the trembling-hand criterion.

the two markets:[5]

$$\widetilde{S}_l^{pe} \equiv (0,0,\widetilde{V}_{l,1}+\widetilde{V}_{l,2}) = (0,0,(1-\alpha)(2\Pi^{HL}-\Pi^{HM}-\Pi^{ML}+2\Pi^{M}))$$

- Each small supplier s_i's offer is such that the buying group is indifferent as when buying the two products from l:

$$\widetilde{S}_{s_i}^{pe} \equiv \widetilde{V}_{s_i,i}+\widetilde{V}_{s_i,j} = \begin{cases} (1-\alpha)((\Pi^{HM}-\Pi^{H})+(\Pi^{ML}-\Pi^{L}))-E \text{ if } \alpha \leq \widetilde{\alpha}^{pe} \\ 0 \text{ if } \alpha > \widetilde{\alpha}^{pe} \end{cases}$$

Resulting profits are such that $\widetilde{\Pi}_r^{pe} = \max\{\pi_{r_i,i}^{HM}+\pi_{r_i,i}^{ML}+\widetilde{S}_{s_i}^{pe}, \pi_{r_i,i}^{HM}+\pi_{r_i}^{ML}\}$, $\widetilde{\Pi}_{s_i}^{pe} = 0$ and $\widetilde{\Pi}_l^{pe} = \pi_{l,i}^{HM}+\pi_{l,j}^{ML}$.

$$\widetilde{\Pi}_r^{pe} \equiv \begin{cases} \widetilde{\Pi}_r^3 = 2(1-\alpha)\Pi^M + \alpha(\Pi^{HM}+\Pi^{ML}) - E \text{ if } \alpha \leq \widetilde{\alpha}^{pe} \\ \widetilde{\Pi}_r^4 = (1-\alpha)(2\Pi^M+\Pi^L+\Pi^H) + (2\alpha-1)(\Pi^{HM}+\Pi^{ML}) \text{ if } \alpha > \widetilde{\alpha}^{pe} \end{cases}$$

$$\widetilde{\Pi}_s^{pe} = \widetilde{\Pi}_{s_1}^{pe} = \widetilde{\Pi}_{s_2}^{pe} \equiv 0$$

$$\widetilde{\Pi}_l^{pe} \equiv (1-\alpha)((\Pi^{HM}-\Pi^{M})+(\Pi^{ML}-\Pi^{M}))$$

With $\widetilde{\alpha}^{pe} \equiv 1 - \frac{E}{\Pi^{HM}-\Pi^{H}+\Pi^{ML}-\Pi^{L}}$.

E.3 Profitability of a full buying group (Proof of Proposition 6)

Similarly to the proof of Proposition D.2, a full buying group leads to listing inefficiency and thus can be profitable only if the threat of replacement is active (*i.e.* it leads to positive slotting fees). Note also that although there are two types of equilibrium listing decisions with a full buying group, the joint profit of the retailers is uniquely defined when suppliers pay a positive slotting fee (*i.e.* $\widetilde{\Pi}_r^1 = \widetilde{\Pi}_r^3$) because there is perfect competition among small suppliers.

[5] Again, the large supplier' slotting fees to have only product A or C listed is zero.

- If $E \geq \Pi^{HM} - \Pi^{ML}$ the threat of replacement absent buying group comes from the large supplier.
  - When $\alpha < \overline{\alpha}_1$, this threat is binding. A full buying group is profitable when $\widetilde{\Pi}_r^1 > 2\overline{\Pi}_{r_i}^1 \Leftrightarrow \alpha < \frac{2(\Pi^{HM}-\Pi^{HL})-E}{\Pi^{HM}-\Pi^{ML}}$.
  - When $\alpha \geq \overline{\alpha}_1$ there is no slotting fee without buying group. A full buying group is profitable when $\widetilde{\Pi}_r^1 > 2\overline{\Pi}_{r_i}^3 \Leftrightarrow \alpha < \frac{2(\Pi^{HM}-\Pi^{H})-E}{3\Pi^{HM}-2\Pi^{H}-\Pi^{ML}}$

  It is straightforward that $\frac{2(\Pi^{HM}-\Pi^{HL})-E}{\Pi^{HM}-\Pi^{ML}} < \frac{2(\Pi^{HM}-\Pi^{H})-E}{3\Pi^{HM}-2\Pi^{H}-\Pi^{ML}} \Leftrightarrow \alpha < \overline{\alpha}_1$.

  To sum-up if $\alpha \leq \min\{\frac{2(\Pi^{HM}-\Pi^{HL})-E}{\Pi^{HM}-\Pi^{ML}}, \frac{2(\Pi^{HM}-\Pi^{H})-E}{3\Pi^{HM}-2\Pi^{H}-\Pi^{ML}}\}$ the full buying group is profitable and leads to exclusion of small suppliers. Otherwise, full buying group is not profitable.

- if $E < \Pi^{HM} - \Pi^{ML}$, the threat of replacement absent buying group comes from the foreign small suppliers.
  - When $\alpha < \overline{\alpha}_2$, this threat is binding. A full buying group is profitable when $\widetilde{\Pi}_r^1 > 2\overline{\Pi}_{r_i}^2 \Leftrightarrow \alpha < \frac{E}{\Pi^{HM}-\Pi^{ML}}$
  - When $\alpha \geq \overline{\alpha}_2$, there is no slotting fee without buying group. In that case, the full buying group is profitable when $\widetilde{\Pi}_r^1 > 2\overline{\Pi}_{r_i}^3 \Leftrightarrow \alpha < \frac{2(\Pi^{HM}-\Pi^{H})-E}{3\Pi^{HM}-2\Pi^{H}-\Pi^{ML}}$

  It is straightforward that $\frac{E}{\Pi^{HM}-\Pi^{ML}} < \frac{2(\Pi^{HM}-\Pi^{H})}{3\Pi^{HM}-2\Pi^{H}-\Pi^{ML}} \Leftrightarrow \alpha < \overline{\alpha}_2$. Hence, if $\alpha \leq \min\{\frac{E}{\Pi^{HM}-\Pi^{ML}}, \frac{2(\Pi^{HM}-\Pi^{H})}{3\Pi^{HM}-2\Pi^{H}-\Pi^{ML}}\}$ the full buying group is profitable and leads to exclusion of small suppliers. Otherwise, no buying group is created.

To sum-up the full buying group is profitable for

$$\alpha \leq \min\{\frac{E}{\Pi^{HM}-\Pi^{ML}}, \frac{2(\Pi^{HM}-\Pi^{H})-E}{3\Pi^{HM}-2\Pi^{H}-\Pi^{ML}}, \frac{2(\Pi^{HM}-\Pi^{HL})-E}{\Pi^{HM}-\Pi^{ML}}\}$$

and is not profitable otherwise.

F Retailers' best strategy (Proof of Proposition 8)

We now compare the retailers' joint profit for each of the three buying strategies (no buying group, partial buying group and full buying group). Again a buying group can be profitable only if the threat of replacement is binding (*i.e.* equilibrium slotting fees are positive).

- When $0 < \Pi^{HM} + \Pi^{ML} \leq 2\Pi^{HL}$ and $\forall E$, the listing decision is (HM, HM) without buying group and (HL, HL) with a buying group. A simple comparison of equilibrium profit gives that: $\widetilde{\Pi}_r^1 < \widehat{\Pi}_r^1$. Hence, a partial buying group is always preferred to a full buying group. From proof D.2, we thus have that a partial buying group is created when

$$\alpha \leq \min\{\tfrac{2E}{\Pi^{HM}-\Pi^{ML}}, \tfrac{2(\Pi^{HM}-\Pi^{H})}{3\Pi^{HM}-2\Pi^{H}-\Pi^{ML}}, \tfrac{2(\Pi^{HM}-\Pi^{HL})}{\Pi^{HM}-\Pi^{ML}}\}$$

  and no buying group is created otherwise.

- When $0 < \Pi^{HM} + \Pi^{ML} - 2\Pi^{HL} \leq E$, the listing decision is (HM, HM) without buying group, (HM, ML) with a partial buying group and (HL, HL) with a full buying group. In this case, $E \geq \max\{\widehat{E}_1, \widehat{E}_2\}$. A simple comparison of equilibrium profit gives that: $\widetilde{\Pi}_r^1 < \widehat{\Pi}_r^3 \Leftrightarrow \Pi^{HM} + \Pi^{ML} - 2\Pi^{HL} \leq E$. Hence, a partial buying group is always preferred to a full buying group. From proof D.2, a partial buying group is created when

$$\alpha \leq \min\{\tfrac{2E+2\Pi^{HL}-\Pi^{HM}-\Pi^{ML}}{\Pi^{HM}-\Pi^{ML}}, \tfrac{\Pi^{HM}-2\Pi^{H}+2\Pi^{HL}-\Pi^{ML}}{3\Pi^{HM}-2\Pi^{H}-\Pi^{ML}}\}$$

  and otherwise no buying group is created.

- When $0 < E < \Pi^{HM} + \Pi^{ML} - 2\Pi^{HL}$, the listing decision is (HM, HM) without buying group, (HM, ML) with a buying group. A simple comparison of profit gives that $\widetilde{\Pi}_r^1 > \max\{\widehat{\Pi}_r^3, \widehat{\Pi}_r^4, \widehat{\Pi}_r^5\}$ and therefore a full buying group is always preferred to a partial buying group. Because $\Pi^{HM} - \Pi^{ML} > \Pi^{HM} + \Pi^{ML} - 2\Pi^{HL}$, from online Appendix E.3. we know that a full buying group is created when

$$\alpha \leq \min\{\tfrac{E}{\Pi^{HM}-\Pi^{ML}}, \tfrac{2(\Pi^{HM}-\Pi^{H})}{3\Pi^{HM}-2\Pi^{H}-\Pi^{ML}}\}$$

and no buying group is created otherwise.

G Proof of proposition 9

- If $\Pi^{HM} + \Pi^{ML} - 2\Pi^{HL} \leq 0$, then both types of buying groups lead to the same equilibrium assortment (HL in both markets), and joint profit is thus the same with the two types of buying groups. Compared to no buying group, joint profit is lower, because $2\Pi^{HL} \leq 2\Pi^{HM}$.

- If $0 < \Pi^{HM} + \Pi^{ML} - 2\Pi^{HL} < E$, then in equilibrium the assortment is HL in both markets with a full buying group, while with a partial buying groups it is HM on one market and ML on the other. In that case, a partial buying group inflicts less losses to the industry profit than a full buying group: the loss created by the assortment distortion is lower. However, both types of buying groups create distortions in the assortment that reduce industry profit.

- If $E \leq \Pi^{HM} + \Pi^{ML} - 2\Pi^{HL}$, then in equilibrium the assortment is HM on one market and ML on the other with both types of buying groups. Again, both types of buying groups create distortions in the assortment that reduce industry profit, but a partial buying group is less harmful.

Under Assumption 5, these results extend to consumer surplus and welfare.

H Numerical application

We use the demand specification of Singh and Vives (1984). We consider that in each market, there are three differentiated products H, M, L, and as the retailers have limited capacity, only two products are available on each market. When the two products X, Z are available, the representative consumer's utility is defined as follows for $x, z \in \{h, m, l\}$ & $x \neq z$, where

h, m, l represents intrinsic preference for products H, M, L:

$$\nu + U_{x,z} = \nu + xq_x + zq_z - \frac{1}{2}(q_x^2 + q_z^2) - aq_x \times q_z.$$

The parameter ν is a numeraire ($p_\nu = 1$), and a represents the degree of substitutability between products x and z. Maximizing the utility of the representative consumer under the budget constraint leads to the following linear demand functions:

$$q_x = \frac{x - az - p_x + ap_z}{1 - a^2}$$
$$q_z = \frac{z - ax - p_z + ap_x}{1 - a^2}$$

We set $h = 2$, $l = 1$ $m \in [1, 2]$ and $a \in [0; 0.5]$; this calibration satisfies the assumptions 1-4 of the model.