Entry by Takeover: Auctions vs. Bilateral Negotiations

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- Similarly, firms can find it more convenient to enter a foreign market by taking over a local firm

  - Hennart and Park (1993): 36% of U.S. market entries by Japanese companies in 1981-89 took place by merger

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  - **bilateral bargaining** between the entrant and the target (private negotiations whose terms cannot be observed by outsiders)
- In a sample of 400 major U.S. takeovers in the 1990s:
  - 50% of the targets were auctioned among multiple bidders;
  - 50% negotiated with a single buyer (Boone and Mulherin, 2007)

Positive Results

- The choice of the takeover target depends on:
  - (i) incumbents' market shares
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- With bargaining, price is lower (for given target) because independent of externalities

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- Trade-off between target shareholders' profit (higher with auction) and consumers' surplus (higher with bargaining)

Related Literature

1. Auctions with downstream interaction among buyers
   - Jehiel and Moldovanu (2000), Das Varma (2002), Inderst and Wey (2004), Ding *et al.* (2013)
2. Direct entry vs. acquisition
   - Gilbert and Newbery (1992), McCardle and Viswanathan (1994)
3. Endogenous Mergers
   - Fridolfsson and Stennek (2005), Qiu and Zhou (2007), Nocke and Whinston (2010, 2013)
4. Takeover premia (corporate finance)
   - Roll (1986), Jensen (1986), Shleifer and Vishny (1990, 2003), Rhodes-Kropf and Viswanathan (2004), Malmendier and Tate (2008)

Outline

1. Model
2. Takeover by Bargaining
3. Takeover by Auction
4. Auctions vs. Bargaining

Model

- Cournot competition with homogeneous goods
- Firms 2,...,n have marginal cost $c_2 = ... = c_n$
- Firm 1 has marginal cost $c_1 < c_2$ (no fixed cost)
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- Firm i's profits:

$$\pi_n\left(c_i; \sum_{k \neq i} c_k\right) = \left(\frac{A - nc_i + \sum_{k \neq i} c_k}{n+1}\right)^2 \equiv \frac{\Phi_i^2}{(n+1)^2}$$

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- We assume that incumbents have no incentive to merge ex-ante (A and/or n large)

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- Costs and synergies are common knowledge
- Two different takeover procedures:
  1. **Bargaining** with take-it-or-leave-it offer by entrant
  2. **Ascending auction** between entrant and other incumbents

Timing

Period 1: E selects the takeover target

Period 2: Auction or bargaining for the target

Period 3: Market competition among the remaining firms

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Period 2: Auction or bargaining for the target

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(E can only select one target)

Efficient and Profit-Maximizing Targets

- Firm 2 is the **profit-maximizing target** iff E obtains a higher profit by taking over 2 rather than 1

$$\pi_n(c_2 - s_2; \cdot) > \pi_n(c_1 - s_1; \cdot) \quad \Leftrightarrow \quad s_2 - s_1 > \frac{n+1}{n}(c_2 - c_1)$$

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$$\frac{1}{n+1}\left(nA - \sum_k c_k + s_i\right)$$

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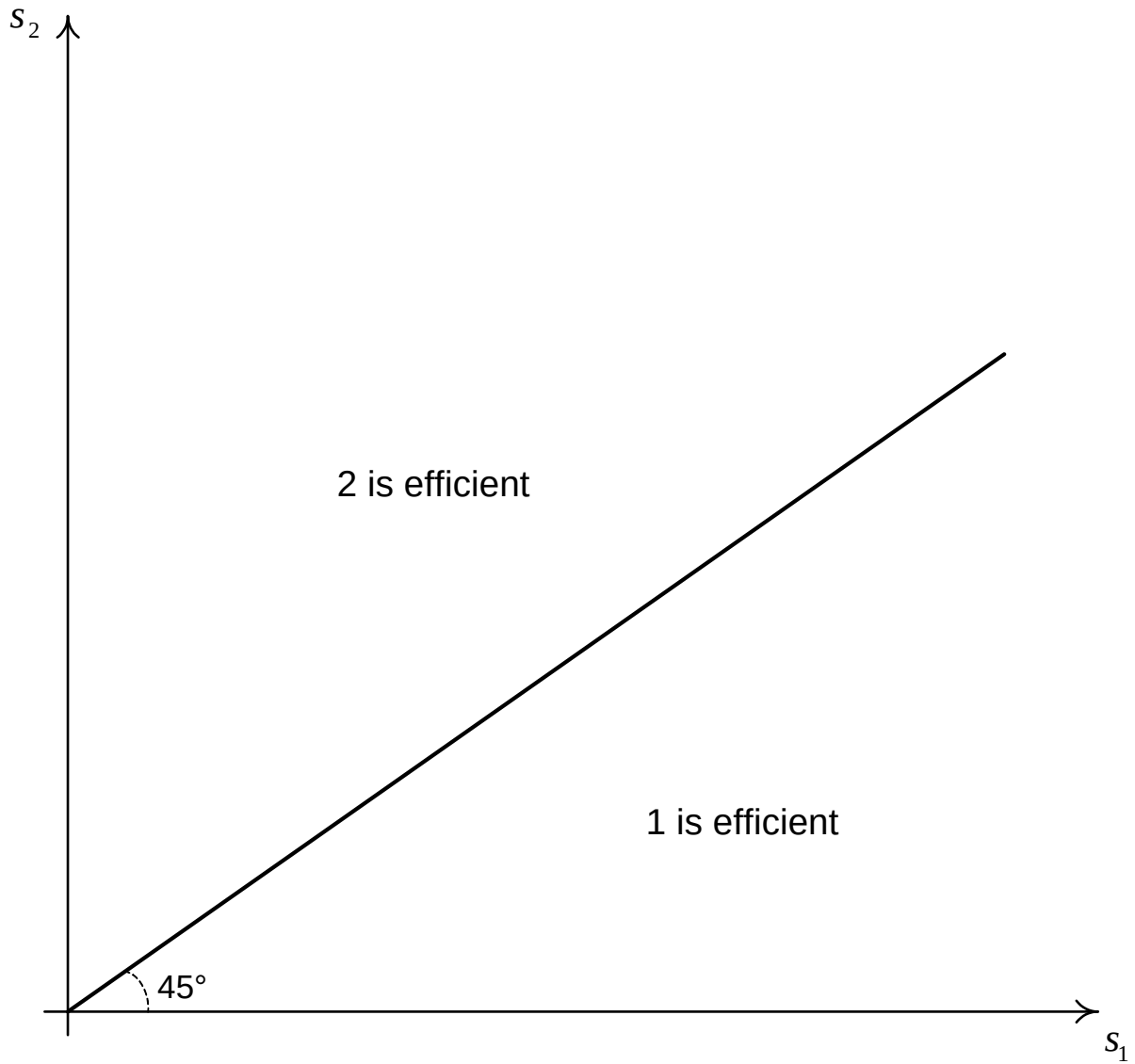
- The **efficient target** is the firm with the strongest synergies (that maximizes consumers' surplus)

Efficient and Profit-Maximizing Targets



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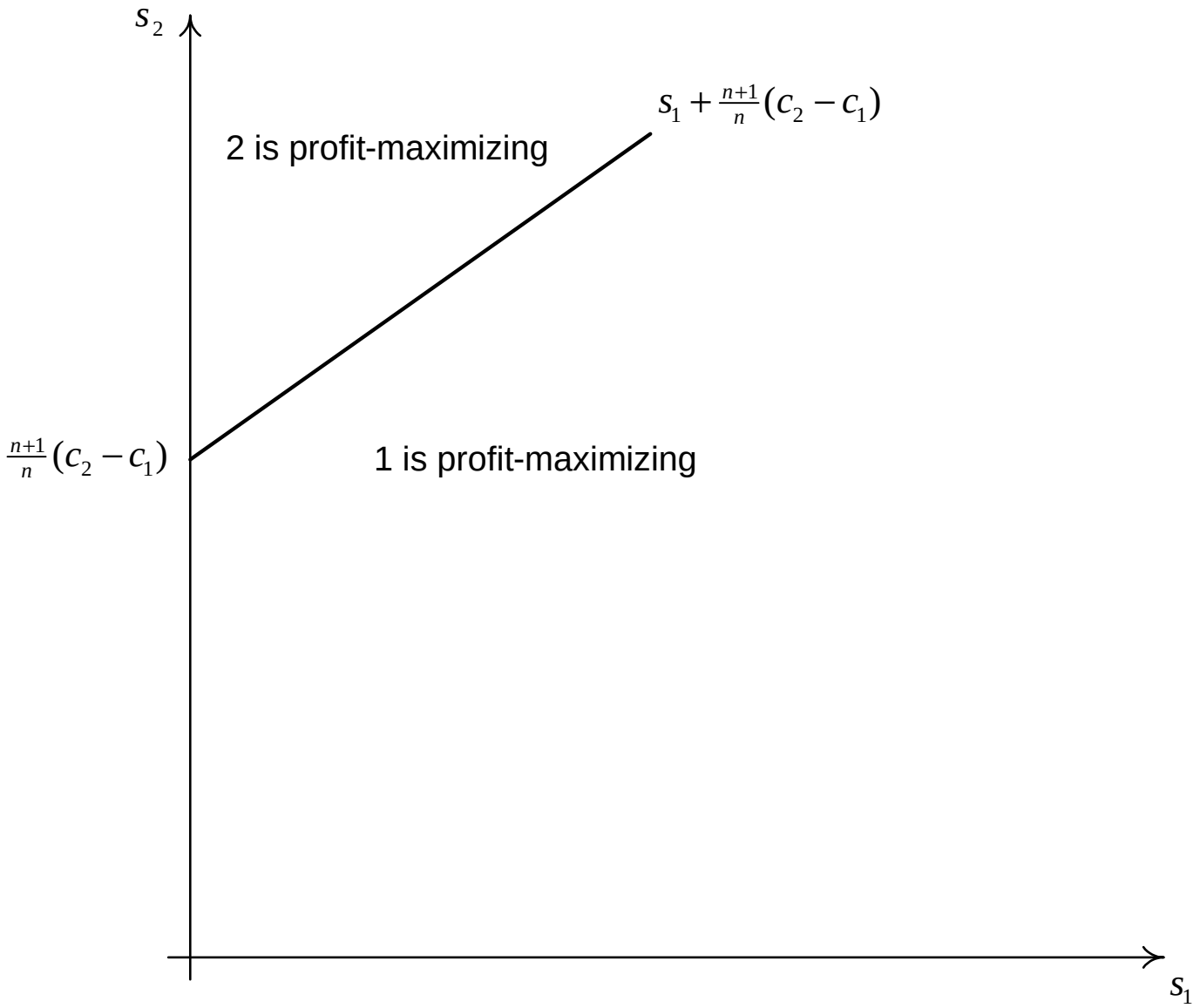

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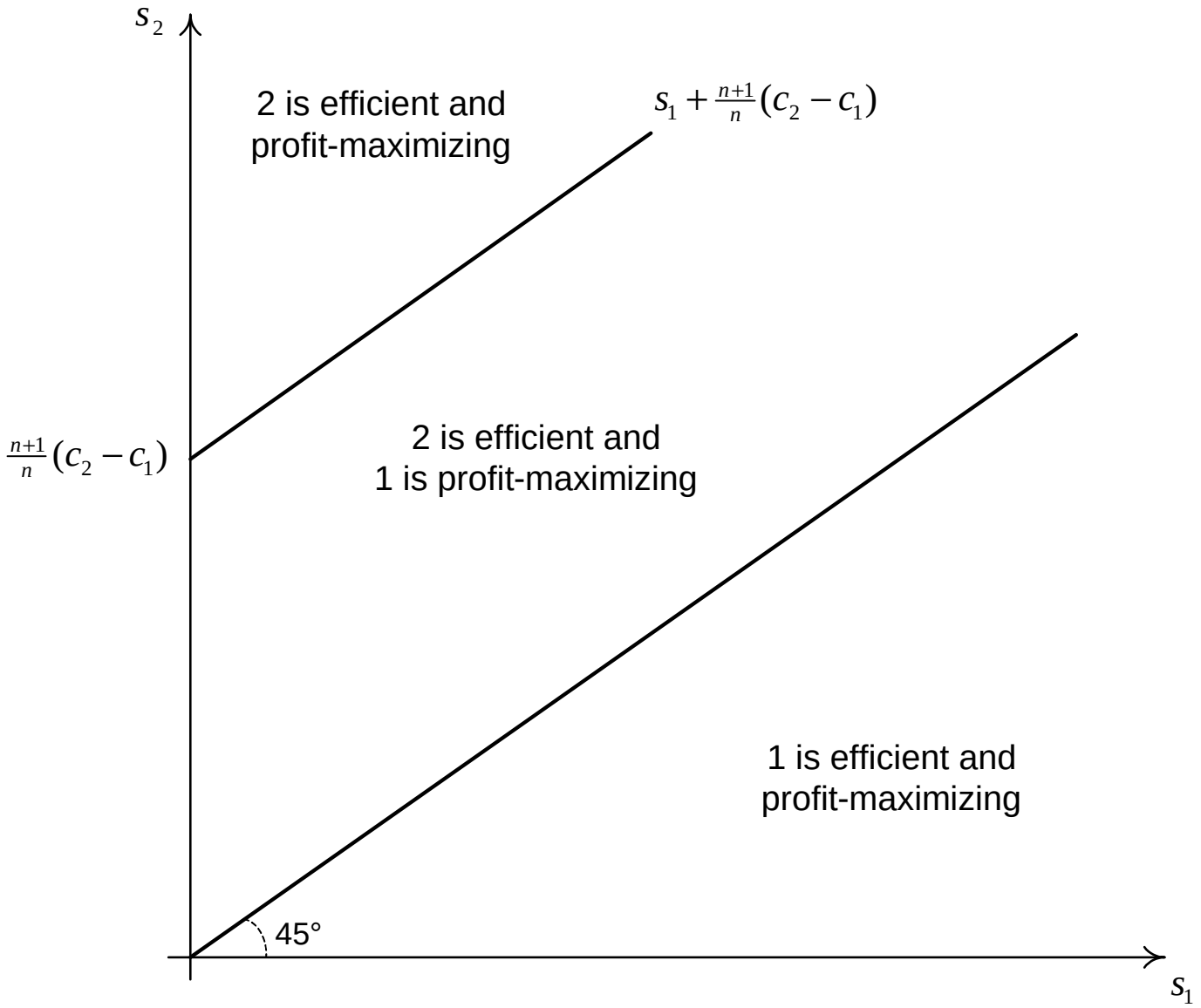

Takeover by Bargaining

- With bargaining, takeover of firm i yields

$$\pi_n\left(c_i - s_i; \sum_{k\neq i} c_k\right) - \underbrace{\pi_n\left(c_i; \sum_{k\neq i} c_k\right)}_{\equiv r^i\text{: reservation value}}$$

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With bargaining, E takes over firm 1 rather than firm 2 if and only if

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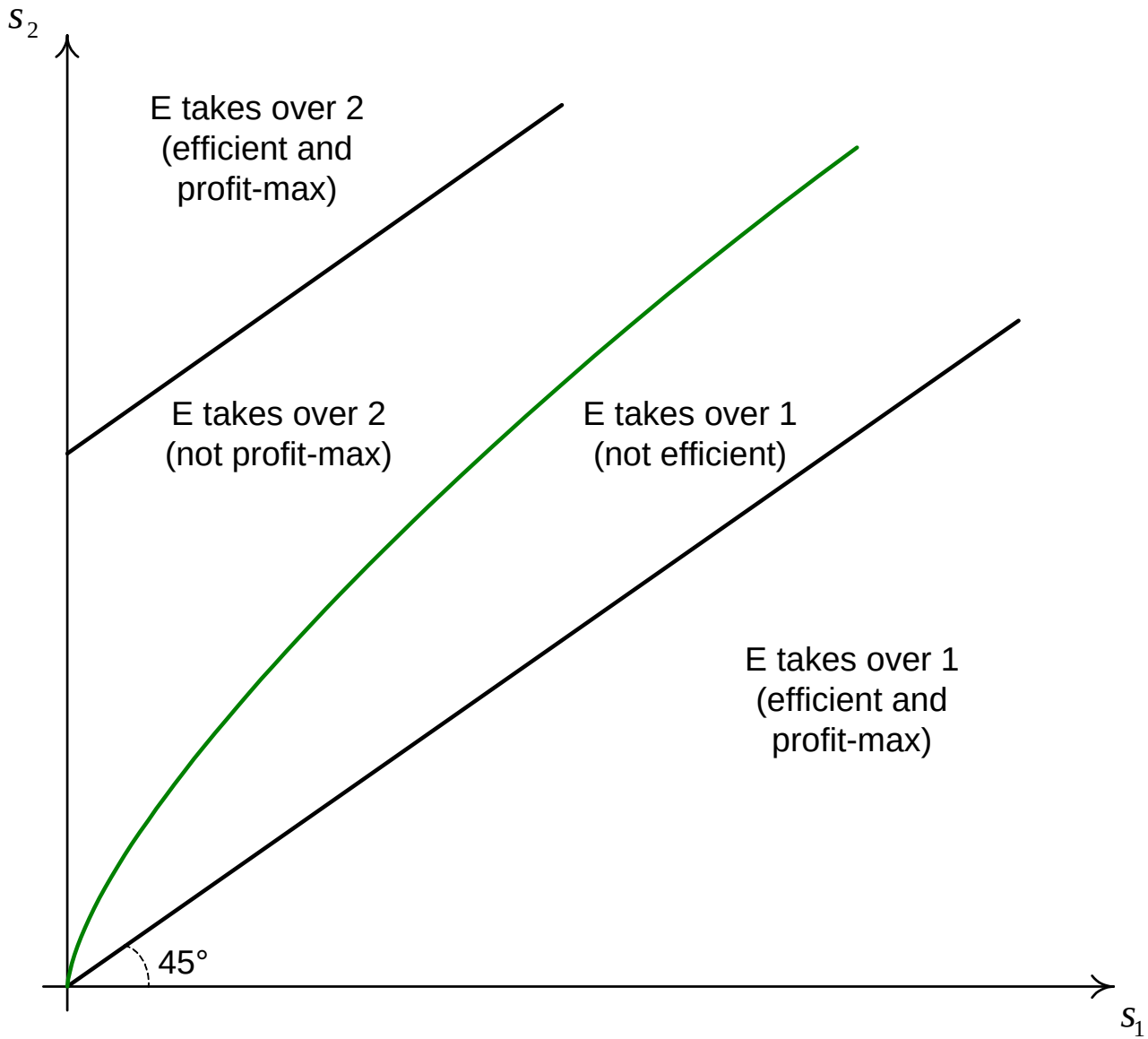

Takeover by Auction

- In an auction for i, firm j's *willingness to pay for blocking* E and merging with i is

$$v_j^i \equiv \underbrace{\pi_{n-1}\left(\min\left\{c_i, c_j\right\}; \sum_{k\neq i,j} c_k\right)}_{j\text{'s profit with merger}} - \underbrace{\pi_n\left(c_j; \sum_{k\neq j} c_k - s_i\right)}_{j\text{'s profit with entry}}$$

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- Two effects:
  1. Profit increase if i and j merge

$$\pi_{n-1}\left(\min\{c_i, c_j\}; \sum_{k\neq i,j} c_k\right) - \pi_n\left(c_j; \sum_{k\neq j} c_k\right)$$

  2. **Externality**: profit reduction if E enters

$$\pi_n\left(c_j; \sum_{k\neq j} c_k\right) - \pi_n\left(c_j; \sum_{k\neq j} c_k - s_i\right)$$

Incumbents' Bids

- Assume arbitrarily small probability that E drops out at a "low" price (to avoid indifference and induce incumbents to bid)
- With externalities, bid may differ from willingness to pay (e.g., each incumbent prefers another incumbent to win)

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- In an auction for firm 1, all incumbents have willingness to pay v_2^1

$\Rightarrow$ In any pure-strategy equilibrium, one incumbent bids up to v_2^1

Auction Price

- In an auction, E pays the highest between other incumbents' bids and the reservation value

Lemma 1

To acquire firm $i \in \{1,2\}$ in an auction, E pays:

– v_j^i *if* $s_i \geq \widehat{s}_i$

– r^i *otherwise*

Furthermore, $\widehat{s}_1 > \widehat{s}_2$

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- High $s_i \Rightarrow$ high externality $\Rightarrow$ high incumbent's bid

Takeover by Auction

Proposition 2

In an auction, E takes over 1 iff:

(*i*)

$$s_1^2 - s_2^2 > \frac{2}{n}\left(s_2\Phi_2 - s_1\Phi_1\right) \quad \textit{when } s_1 \leq \widehat{s}_1 \textit{ and } s_2 \leq \widehat{s}_2;$$

(*ii*)

$$s_1^2 - s_2^2 > \frac{2}{n}\left(s_2\Phi_2 - s_1\Phi_1\right) + \frac{s_2}{n^2}\left(s_2 - 2\Phi_1\right) - \frac{\Phi_2}{n^4}\left[\Phi_2 + n\left(2\Phi_1 - n\Phi_2\right)\right]$$

when $s_1 \leq \widehat{s}_1$ *and* $s_2 > \widehat{s}_2$;

(*iii*)

$$s_1^2 - s_2^2 > 2\left(\frac{ns_2+s_1}{n^2+1}\right)\Phi_2 - 2\left(\frac{ns_1+s_2}{n^2+1}\right)\Phi_1 \quad \textit{when } s_1 > \widehat{s}_1$$

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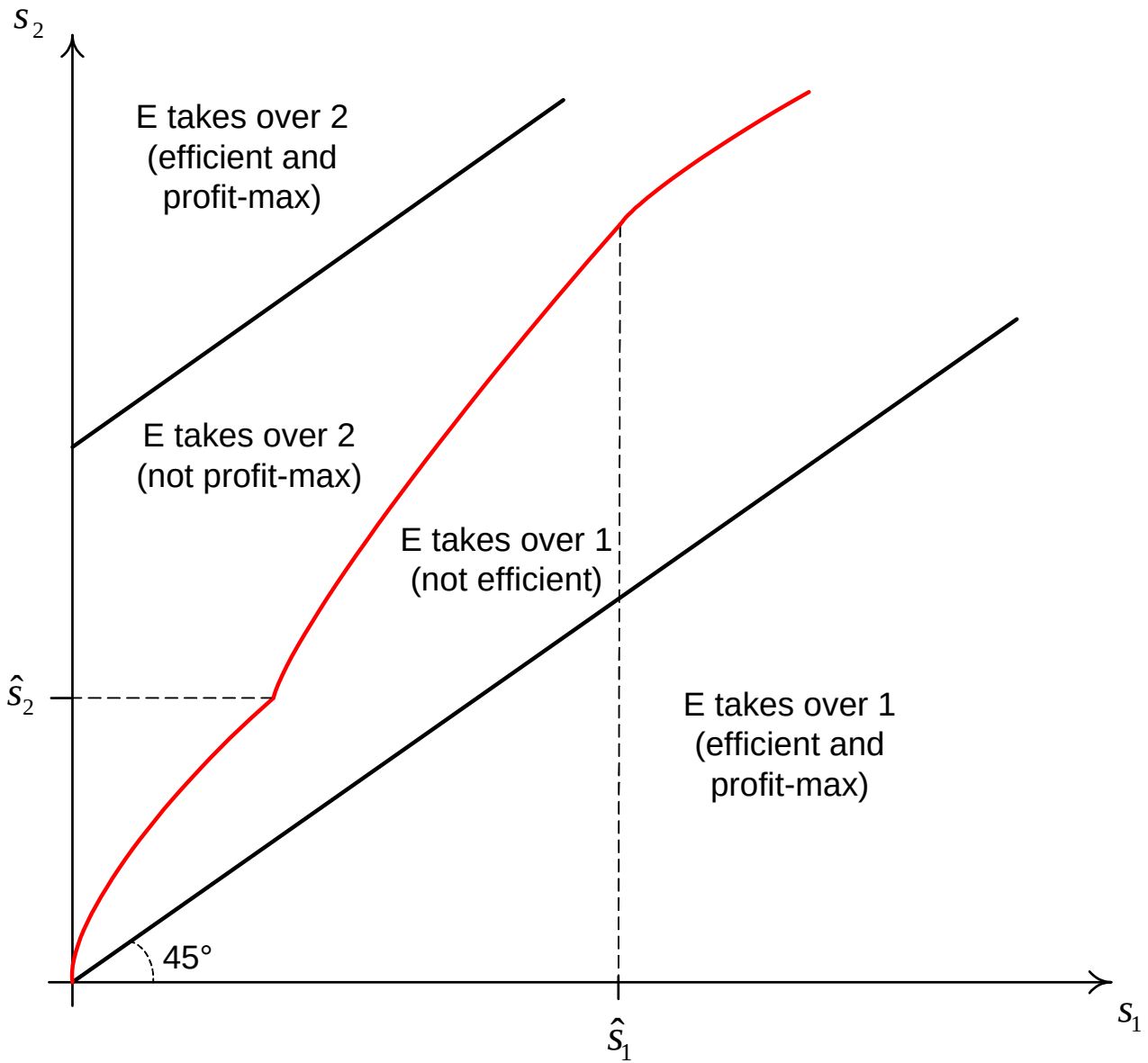
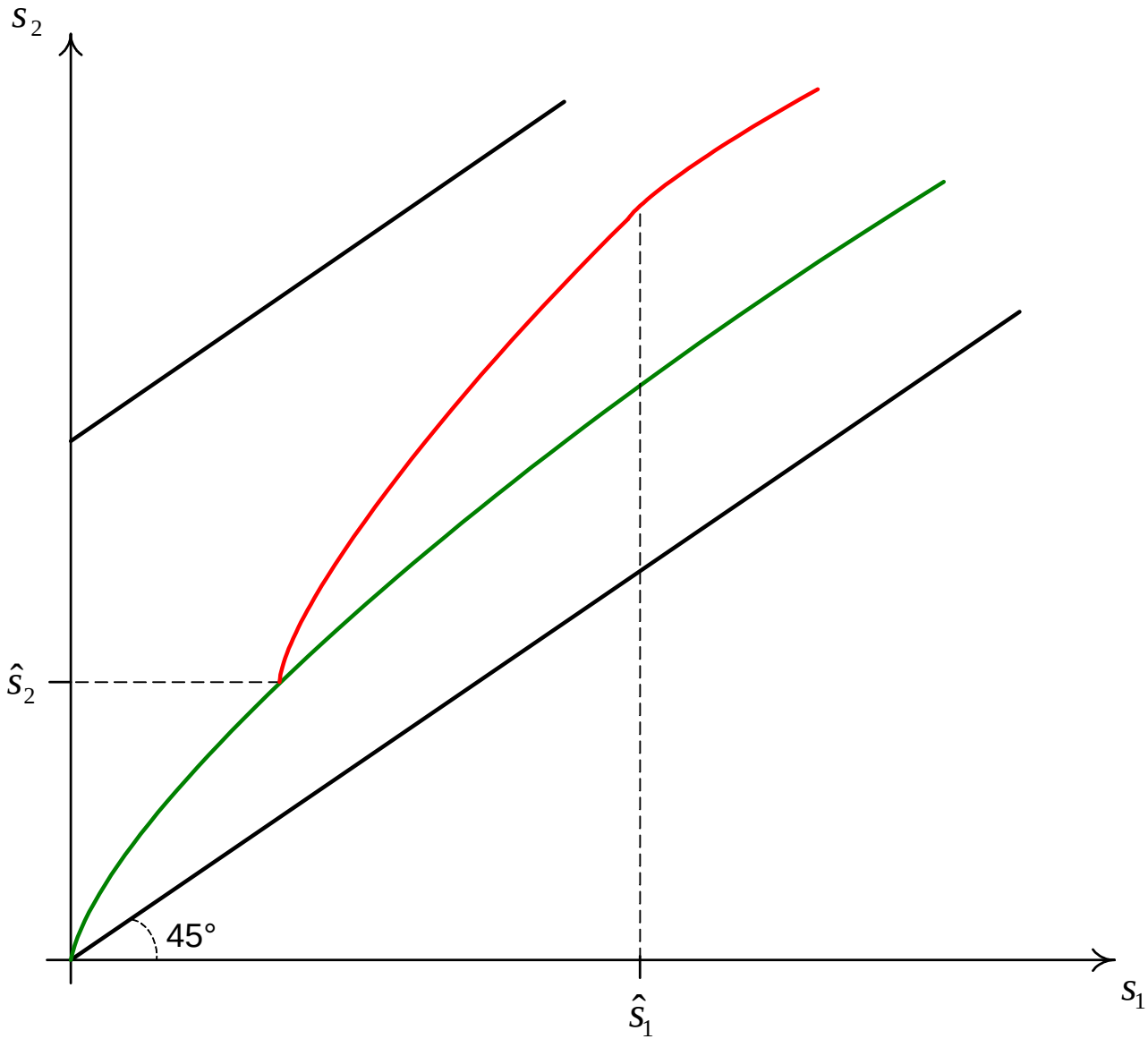


Auctions vs. Bargaining



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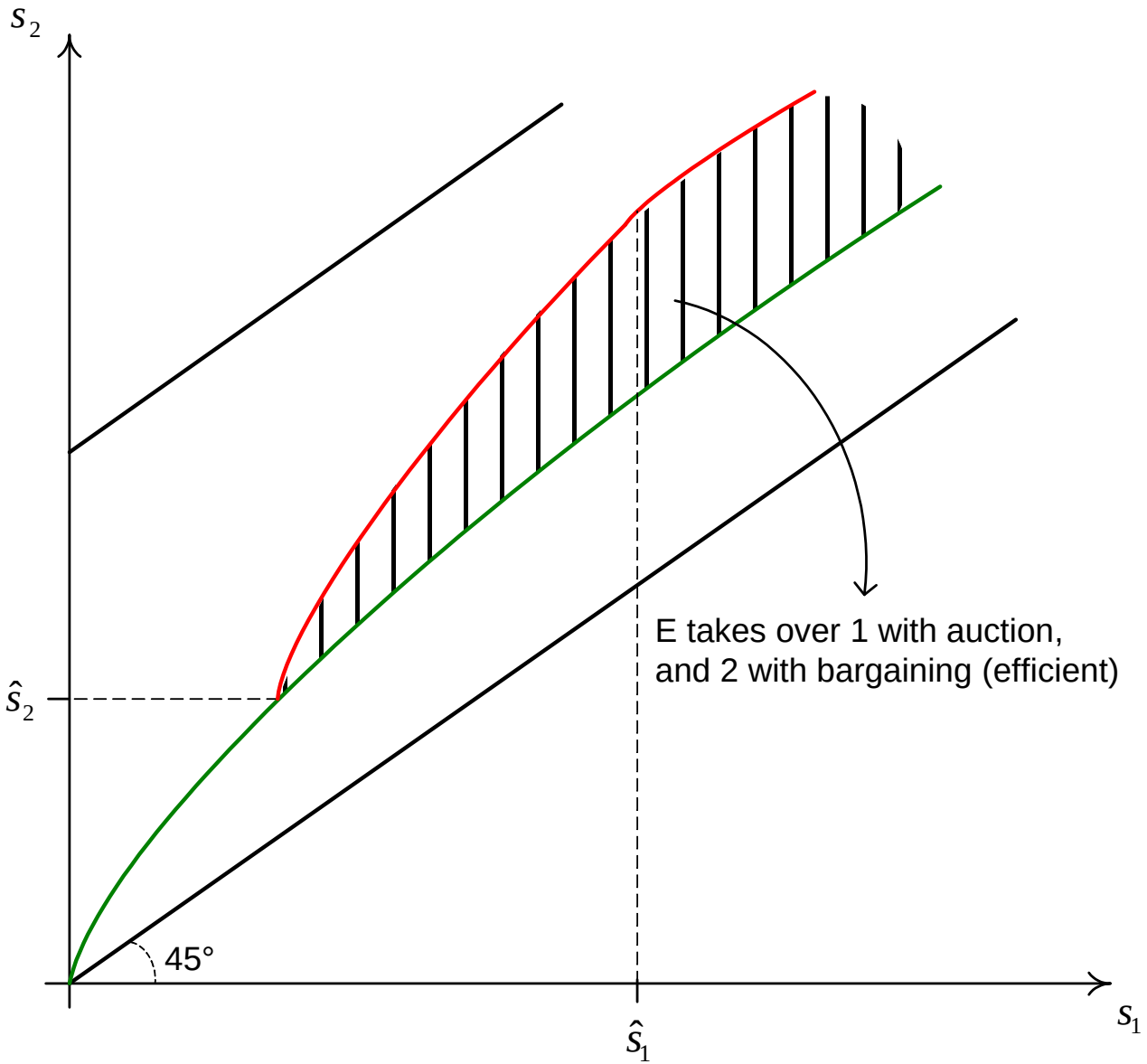

Auctions vs. Bargaining

Proposition 3

- *If a firm is profit-maximizing and efficient, E takes it over both with auction and with bargaining*
- *If 1 is profit-maximizing and 2 is efficient:*
  (i) E takes over 1 with auction and 2 with bargaining when:
    (a) $s_1 > \widehat{s}_1$ *and*

$$\frac{2}{1+n^2}\left(\Phi_1 s_2 - \Phi_2 s_1\right) - \frac{2}{n(1+n^2)}\left(s_1\Phi_1 - s_2\Phi_2\right) > s_2^2 - s_1^2 - \frac{2}{n}\left(s_1\Phi_1 - s_2\Phi_2\right) > 0$$

    (b) $s_1 \leq \widehat{s}_1$ *and*

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  (ii) E never takes over 2 with auction and 1 with bargaining

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$\Rightarrow$ **Takeovers by auction result in a (weakly) lower consumer surplus than takeovers by bargaining**

Takeover Policy

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Extensions

1. Generalized Nash bargaining details
2. Collusion among incumbents to block entry details
3. Small markets

Small Markets

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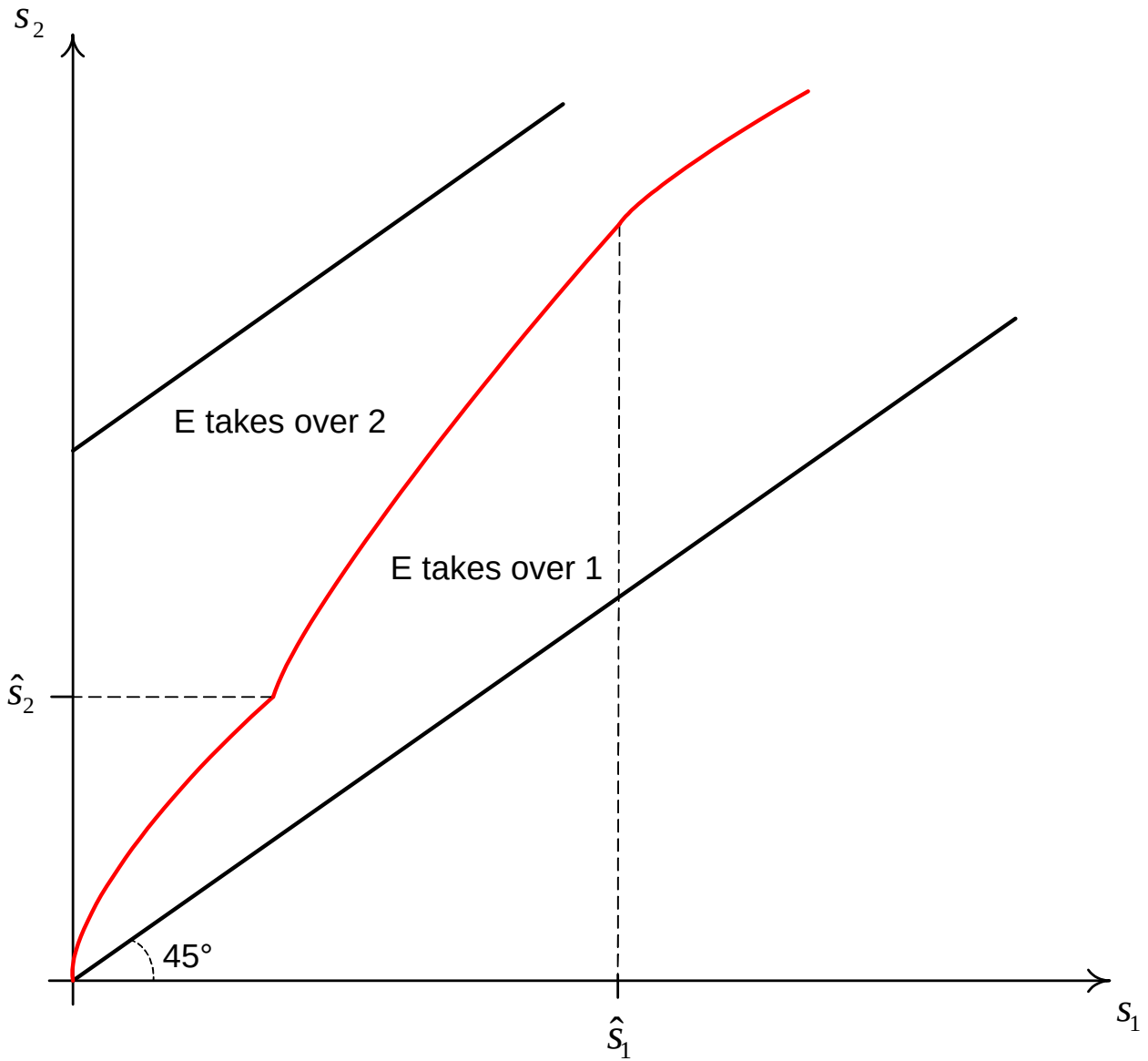
  - target's reservation value never binds

  $\Rightarrow$ E is more likely to take over firm 1
  – i.e., even if it has lower synergy

Takeover by Auction



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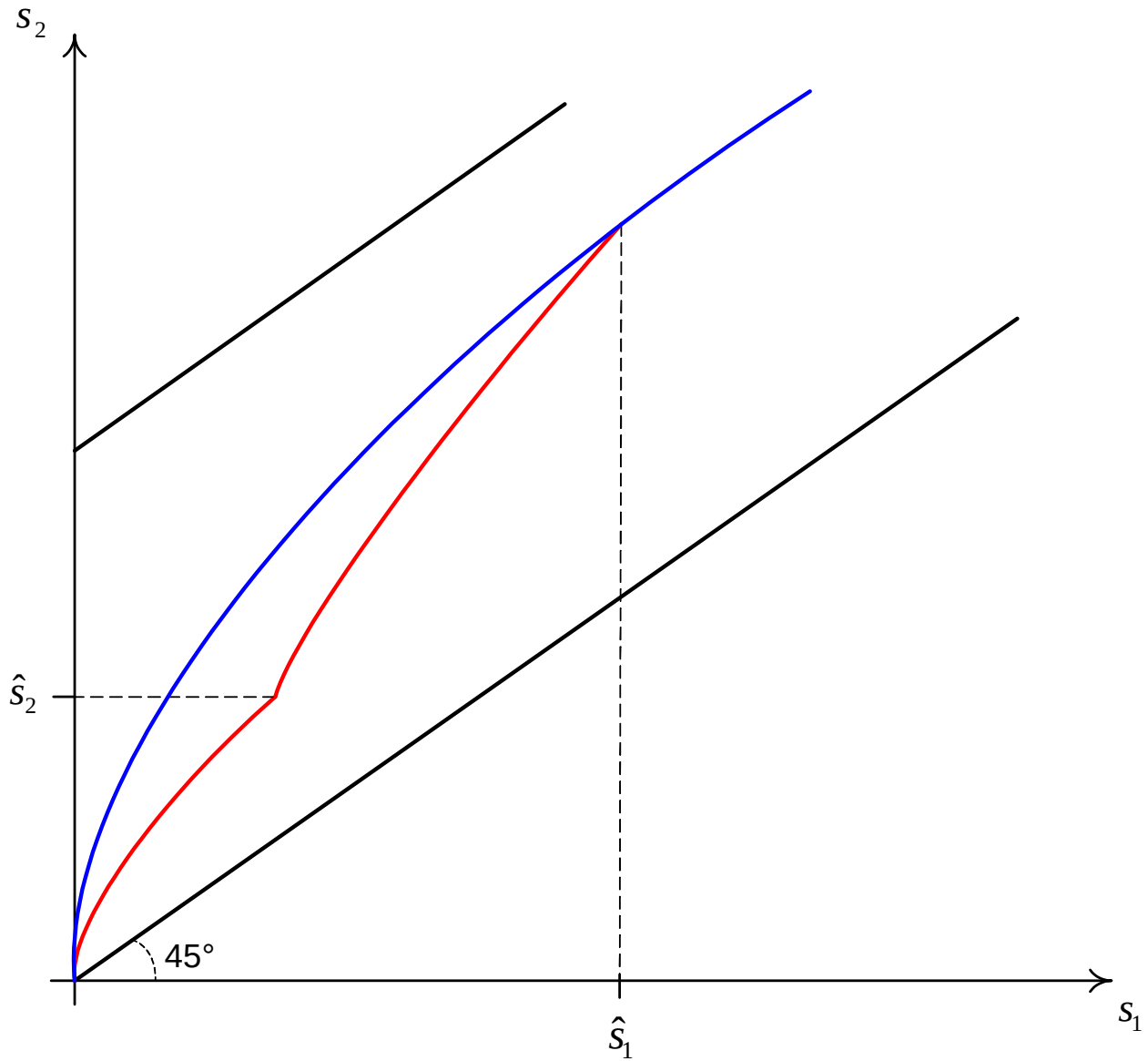

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$\Rightarrow$ Auctions are more likely to reduce consumer surplus

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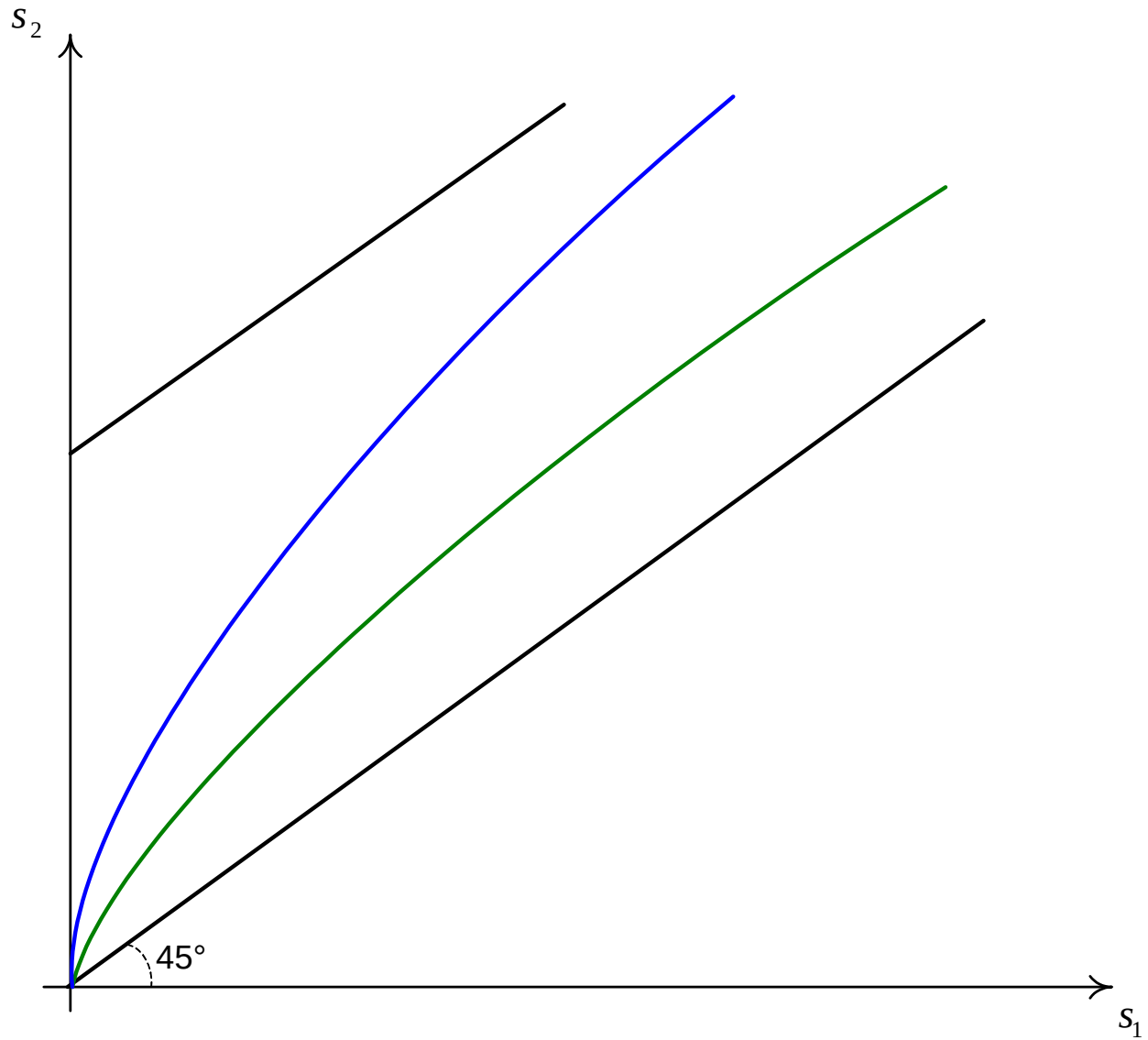

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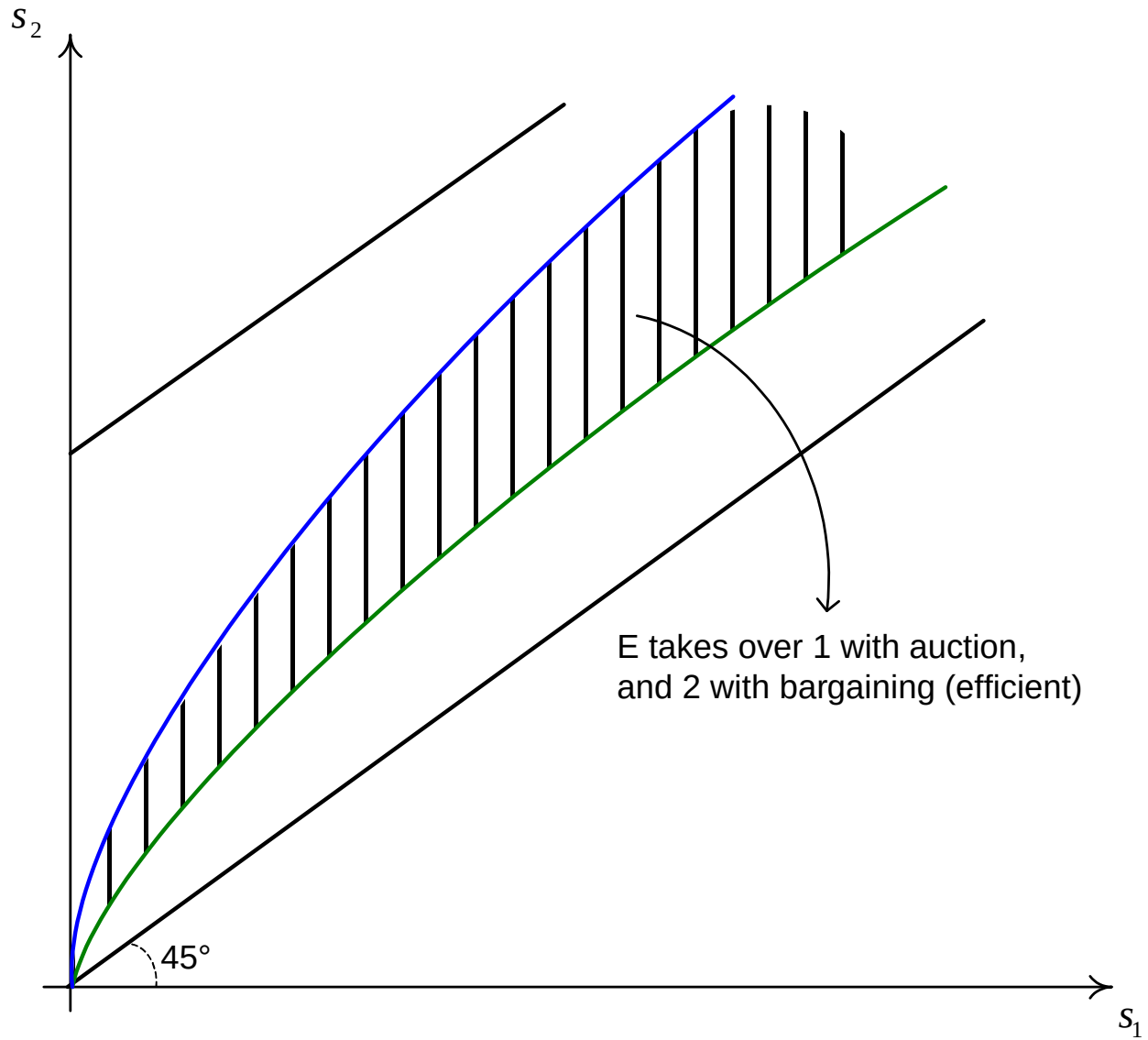

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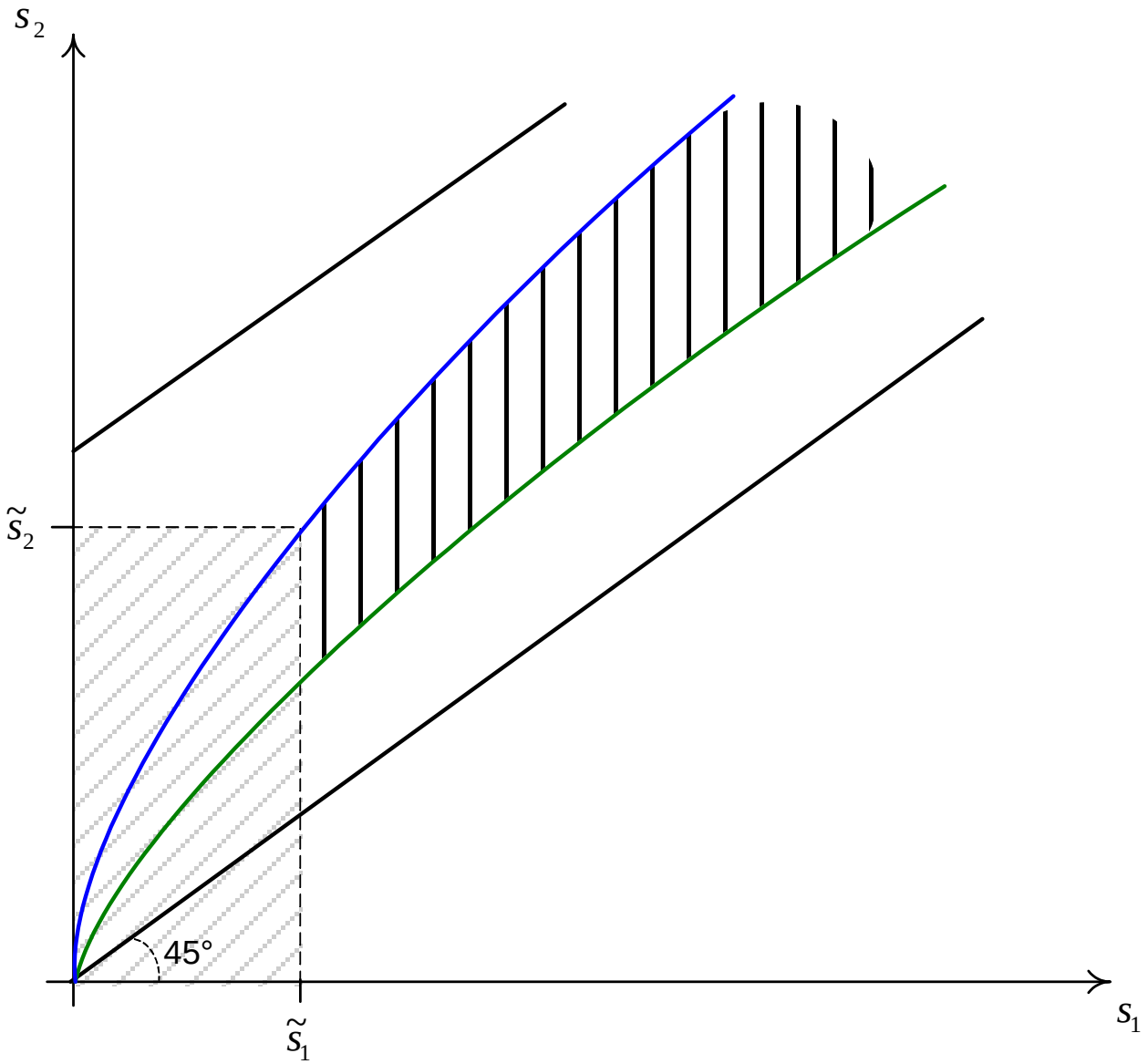

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- The negative externality imposed on incumbents by entry:
  - affects the takeover price with **auctions** (takeover premia)
  - but not with **bilateral negotiations**

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Conclusions

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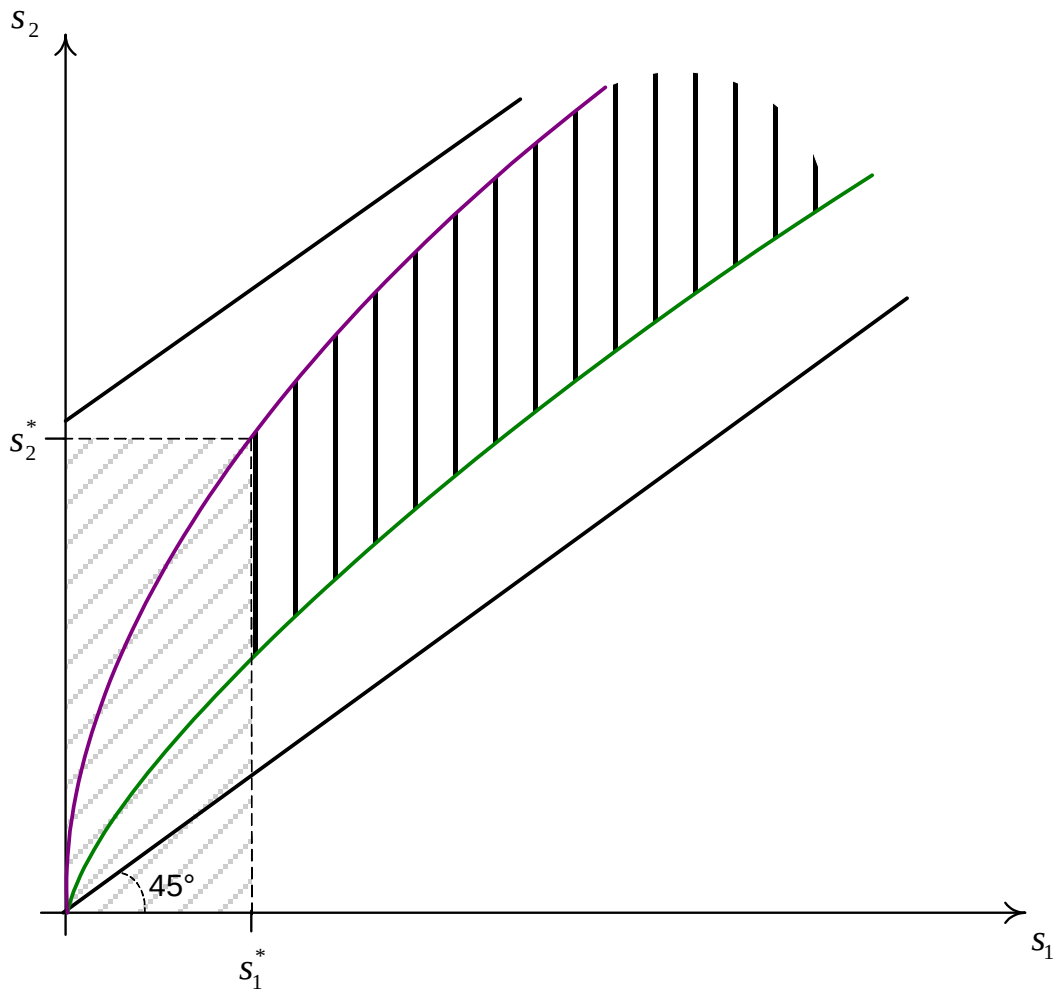
- Target choice as in our main model extensions

Collusion among Incumbents



extensions