Globalization and Firms: The Challenge for Theory

J. Peter Neary

University of Oxford and CEPR

Chaire Théorie Économique et Organisation Sociale
College de France, Paris
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Outline of the Talk

Motivation

Growing empirical evidence: large firms matter for trade

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- 1st wave of micro data (1995-): Exporting firms are exceptional:
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- 1st wave of micro data (1995-): Exporting firms are exceptional:
  - Larger, more productive
- 2nd wave: Even within exporters, large firms dominate:
  - Distribution of exporters is bimodal
  - The firms that matter (for most questions) are different: larger, multi-product, multi-destination

[Bernard et al. (*JEP* 2007), Mayer and Ottaviano (2007)]

U.S. Evidence

Table 4

Distribution of Exporters and Export Value by Number of Products and Export Destinations, 2000

A: Share of Exporting Firms

Number of products	Number of countries: 1	2	3	4	5+	All
1	40.4	1.2	0.3	0.1	0.2	42.2
2	10.4	4.7	0.8	0.3	0.4	16.4
3	4.7	2.3	1.3	0.4	0.5	9.3
4	2.5	1.3	1.0	0.6	0.7	6.2
5+	6.0	3.0	2.7	2.3	11.9	25.9
All	64.0	12.6	6.1	3.6	13.7	100

B: Share of Export Value

Number of products	Number of countries: 1	2	3	4	5+	All
1	0.20	0.06	0.02	0.02	0.07	0.4
2	0.19	0.12	0.04	0.03	0.15	0.5
3	0.19	0.07	0.05	0.03	0.19	0.5
4	0.12	0.08	0.08	0.04	0.27	0.6
5+	2.63	1.23	1.02	0.89	92.2	98.0
All	3.3	1.5	1.2	1.0	92.9	100

C: Share of Employment

Number of products	Number of countries: 1	2	3	4	5+	All
1	7.0	0.0	0.0	0.0	0.0	7.1
2	1.9	2.6	0.1	0.0	0.0	4.6
3	1.3	1.0	0.8	0.0	0.2	3.3
4	0.5	0.4	0.3	0.2	0.2	1.6
5+	3.5	2.6	4.3	4.1	68.8	83.3
All	14.2	6.7	5.5	4.3	69.2	100

Source: Data are from the 2000 Linked-Longitudinal Firm Trade Transaction Database (LFTTD).
Notes: Table displays the joint distribution of U.S. manufacturing firms that export (top panel), their export value (middle panel), and their employment (bottom panel), according to the number of products firms export (rows) and their number of export destinations (columns). Products are defined as ten-digit Harmonized System categories.

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1 product,
1 destination only:

40.4% of firms

0.20% of export value

7.0% of employment

5+ products:

& 5+ dests.:

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92.2% of export value

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Similarly in France

TABLE 1
Distribution of Manufacturing Exports by Number of Products and Markets

Number of		*US 2000*		*France 2003*	
Products	*Markets*	*% Share of Exporting Firms*	*% Share of Value of Exports*	*% Share of Exporting Firms*	*% Share of Value of Exports*
1	1	40.4	0.2	29.6	0.7
5+	5+	11.9	92.2	23.3	87.3
5+	1+	25.9	98.0	34.3	90.8

Notes:
Data are extracted from Bernard et al. (2007, Table 4), and Mayer and Ottaviano (2007, Table A1). Products are defined as 10-digit Harmonised System categories.

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- They do more R&D

So much for facts, what about theory?!

Mainstream model of firms in international trade:

[Krugman (1980)-Melitz (2003)]

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Mainstream model of firms in international trade:

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- So: No “superstar” firms

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- In principle: No restrictions [Chamberlin (1933)]
  - Key feature: Firms take not price but demand function as given
  - But: Hard to get results or extend to general equilibrium
- Breakthrough came with a specific tractable form: CES [Dixit-Stiglitz (1977)]

$$U = \left[\int_{i \in \Omega} u\{x(i)\} di \right]^{1/\theta}, \qquad u\{x(i)\} = x(i)^{\theta}, \qquad 0 < \theta < 1 \quad (1)$$

$$\Leftrightarrow \quad x(i) = \alpha [\lambda p(i)]^{-\frac{1}{1-\theta}} \quad (2)$$

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- BUT: Very special ...

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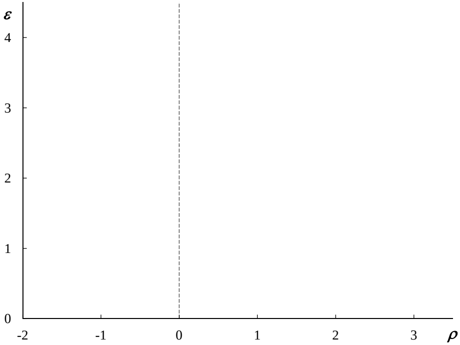

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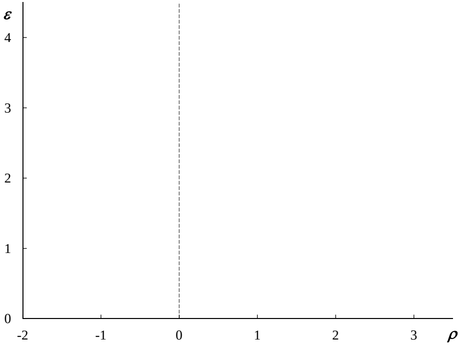

- Alternative measures of slope and curvature . . .

Skip

The Admissible Region

- For a monopoly firm:
  - First-order condition:
    $p + xp' = c \geq 0 \quad \Rightarrow \quad \varepsilon \geq 1$
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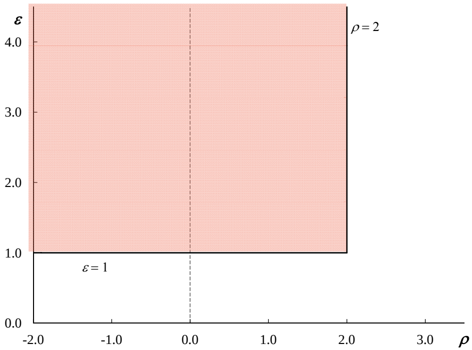

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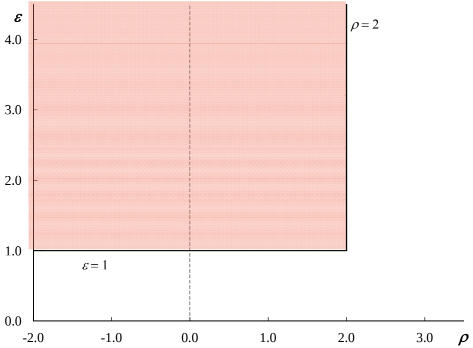

- Both less stringent in oligopoly

Details

CES Demands

- In general, both ε and ρ vary with sales
- Exception: CES/iso-elastic case:
  - $p = \beta x^{-1/\sigma}$
  - $\Rightarrow \quad \varepsilon = \sigma, \quad \rho = \frac{\sigma+1}{\sigma} > 1$
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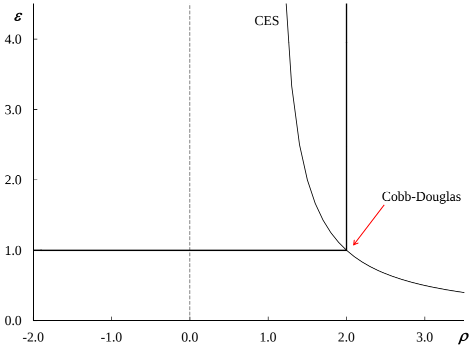

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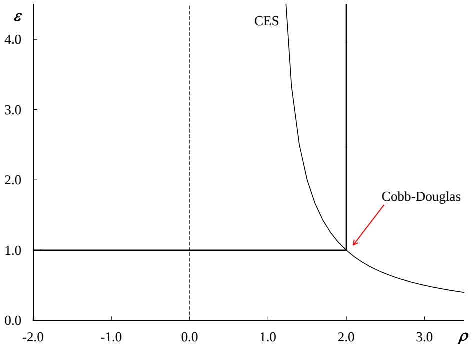

Cobb-Douglas: $\varepsilon = 1, \rho = 2$; just on boundary of both FOC and SOC

Super-Convexity

[Mrázová-Neary (2011)]

- Definition :

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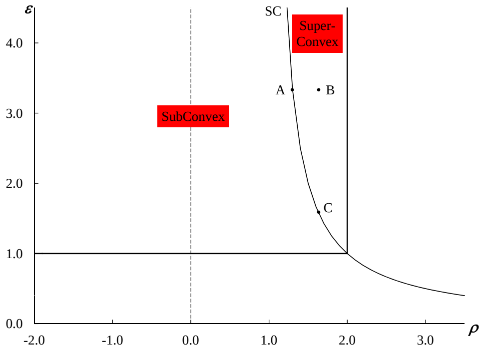

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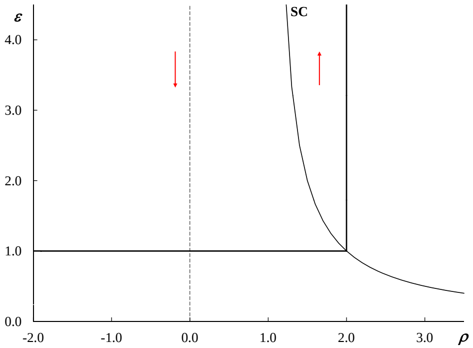

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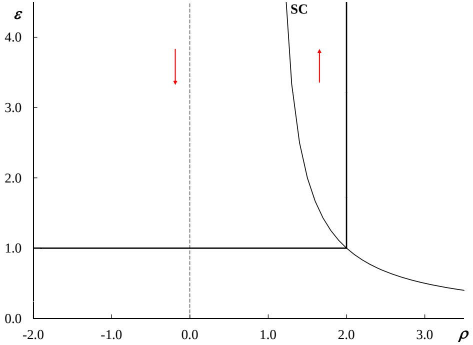

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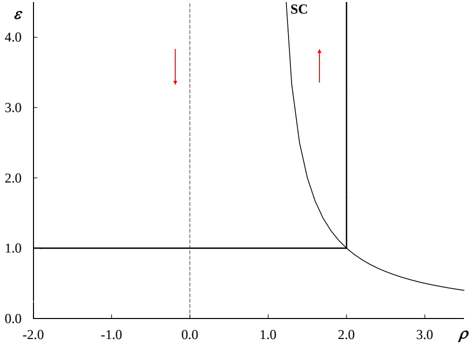

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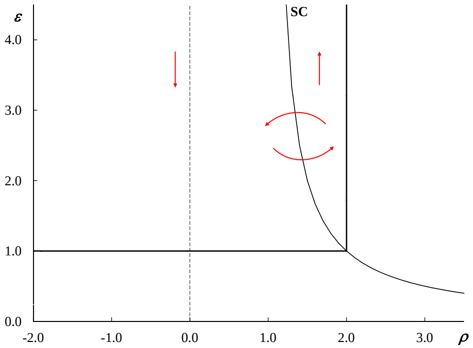

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- The comparative-statics analogue of a phase diagram:
  - Arrows indicate direction as sales rise

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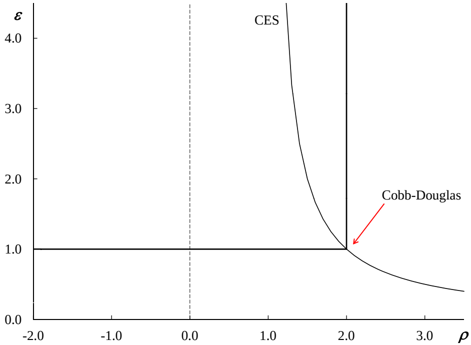

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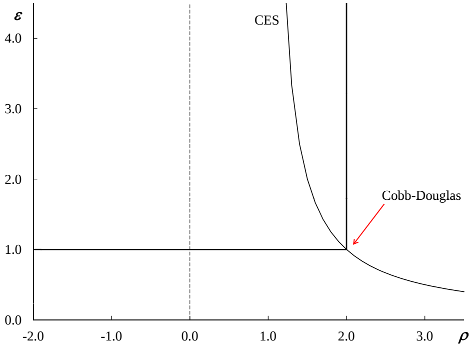

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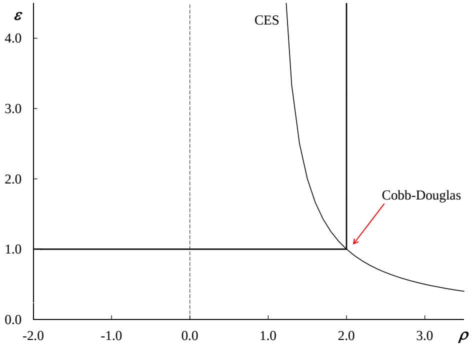

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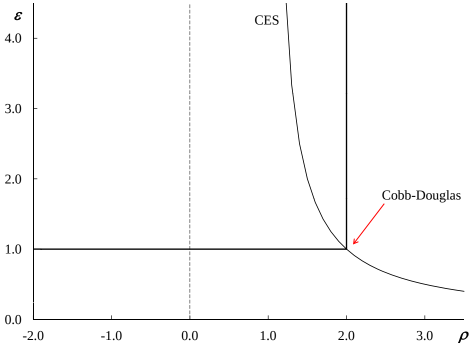

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  - E is independent of ϕ in CES and linear cases. Does this generalize?

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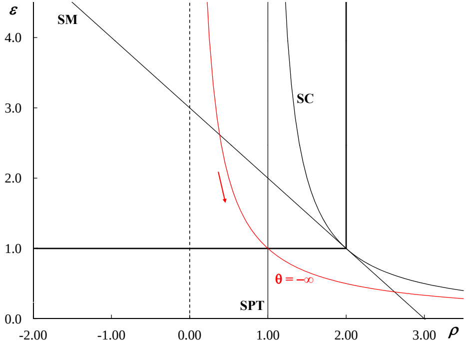

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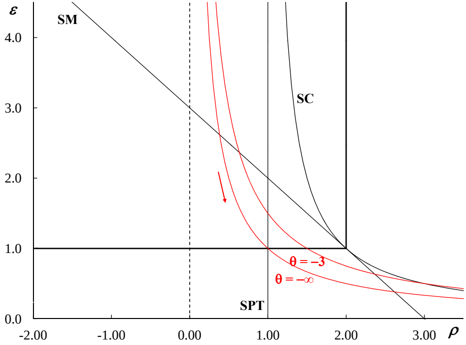

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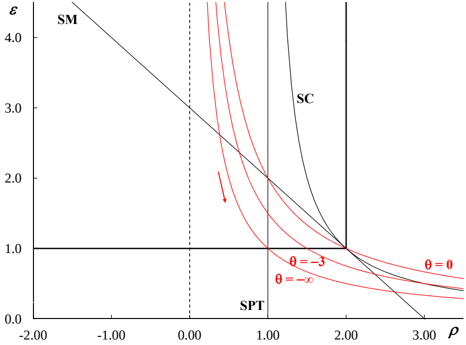

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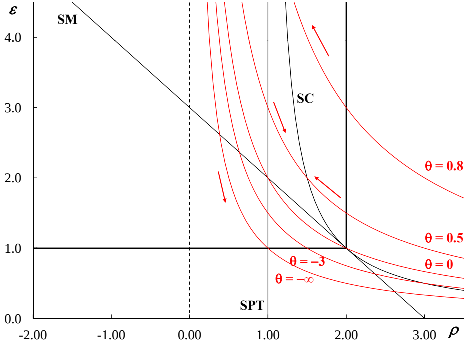

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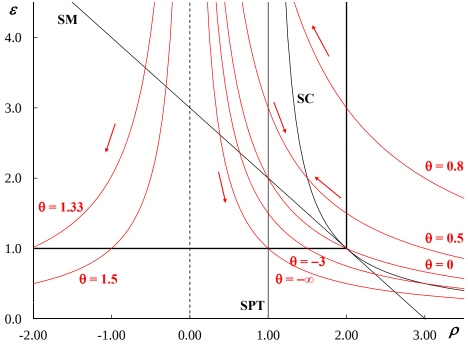

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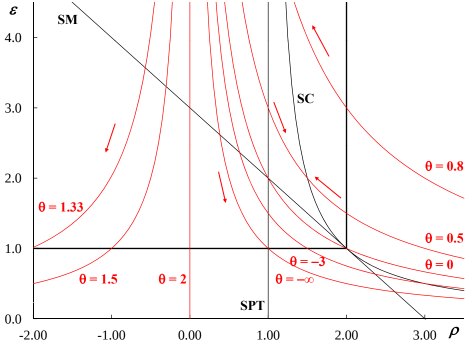

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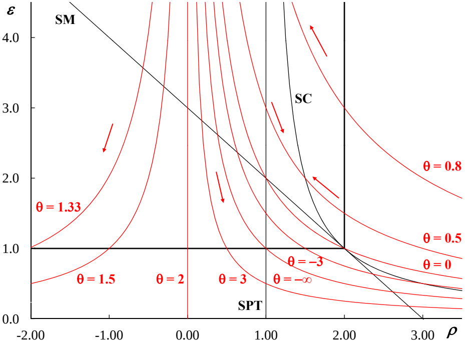

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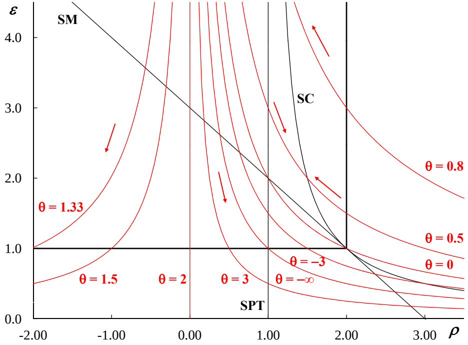

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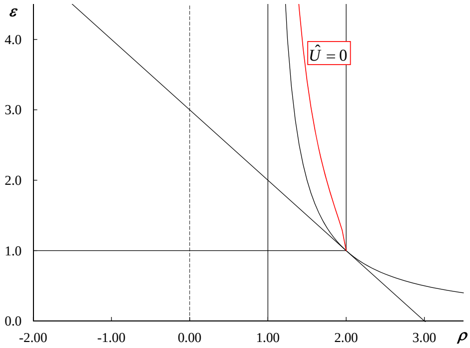

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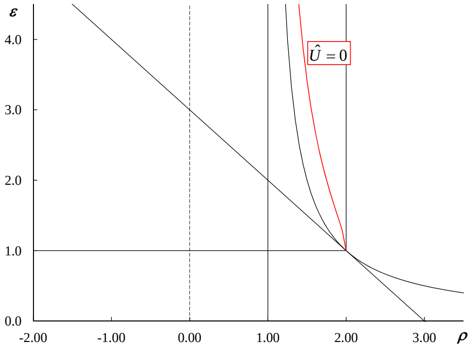

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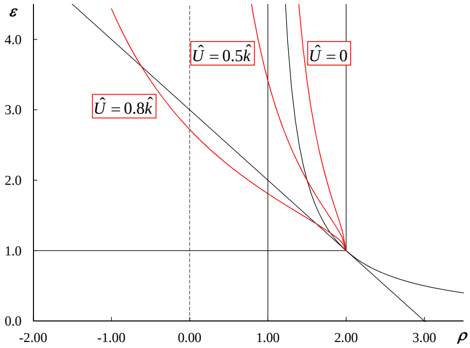

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- . . . but not much!
  - Firms are infinitesimal
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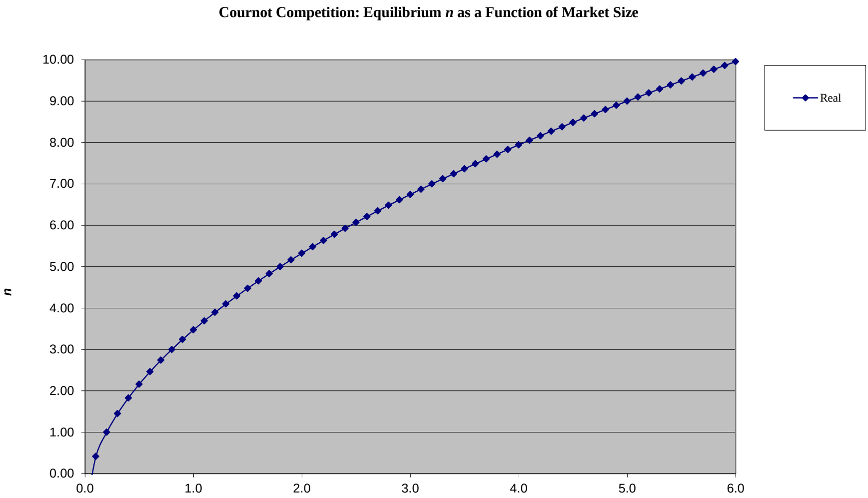
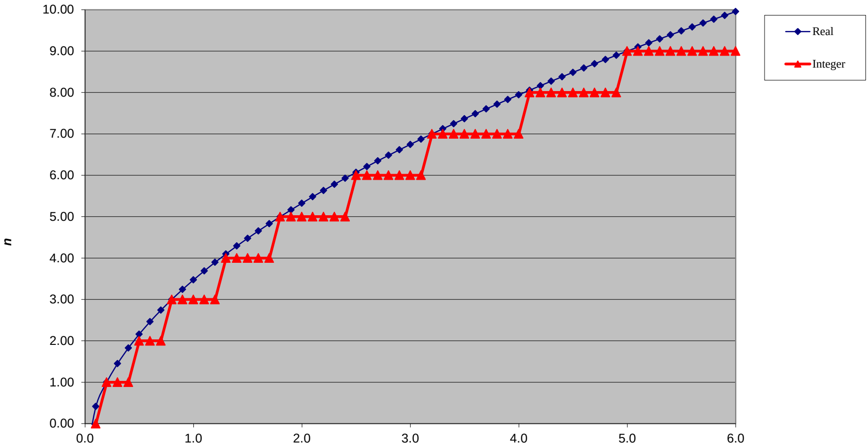
- Entry and exit are much less important for value of exports than for the number of firms
- Even with free entry, "natural oligopoly" may prevail if fixed costs can be chosen endogenously
  [Dasgupta-Stiglitz (*EJ* 1980), Gabszewicz-Thisse (*JET* 1980), Shaked-Sutton (*Em* 1983)]

Free-Entry Cournot: Market Size and Firm Numbers

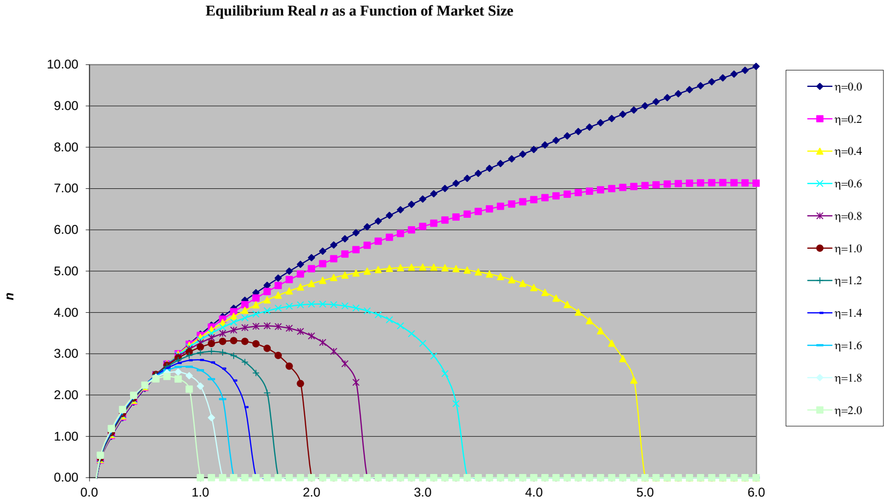


Free-Entry Cournot with Integer Firms

Cournot Competition: Equilibrium *n* as a Function of Market Size



Natural Oligopoly: Market Size and Firm Numbers



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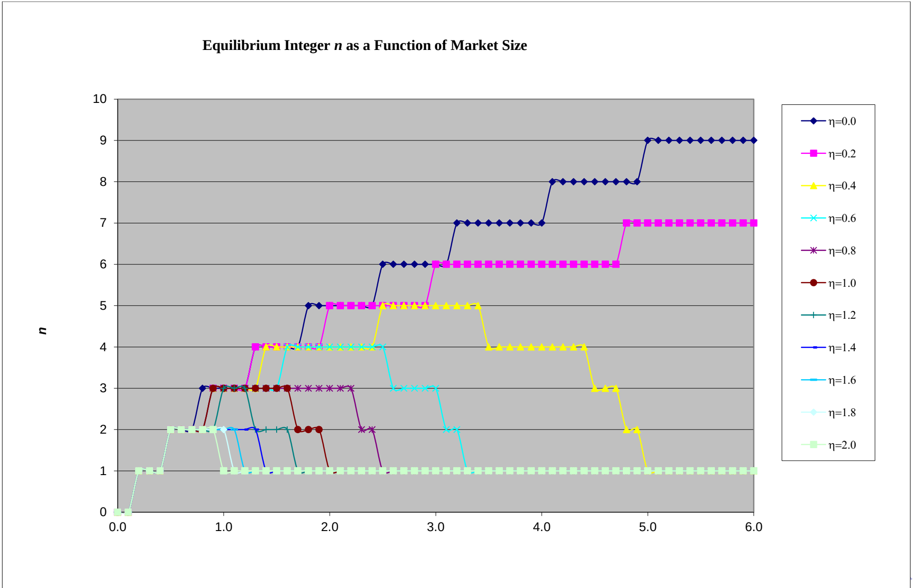

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$$U = \int_{i \in \Omega} u\{x(i)\} di \quad \Leftrightarrow \quad x(i) = x[\lambda p(i)] \tag{3}$$

- Application: Cross-border mergers [Neary (*REStud* 2007)]
  - Mergers may be for strategic or synergistic reasons
  - In partial equilibrium, strategic mergers must lower consumer surplus
  - In GE, they can raise welfare if resources are reallocated to more efficient firms

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  - Oligopoly of multi-product firm . . .
  - . . . plus a monopolistically competitive fringe
    - Technically: Each large firm produces a finite measure of goods
    - All products are differentiated and of measure zero
    - Fits with recent work on multi-product firms in trade
      [Eckel and Neary (*REStud* 2010), Bernard et al. (*QJE* 2011)]
- Some progress to date:
  - "David and Goliath": Neary (*WE* 2009), Shimomura and Thisse (*RJE* 2012), Parenti (2012)

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- Some desirable features:
    - Not too reliant on special functional forms
    - Recognise strategic behaviour by large firms
    - Allow for general equilibrium
    - . . . and for free entry, at least by small firms
    - Allow for superstar firms

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