



## Barick Chung

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2012-2014 Lecturer, School of Economics and Finance, University of Hong Kong.  
2006-2012 Instructor, Department of Economics, CUHK – Hong Kong.

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2003-2007 Ph.D. (Business) Indiana University – Bloomington.  
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Research paper:  
Chung, Barick, "Two Level Price Discrimination and Vertical Relationship" (March 05, 2012). Available at SSRN: <http://ssrn.com/abstract=1997070>.

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## ECO 2011 (Sections L07-10) Basic Microeconomics

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Mankiw, Gregory, 2012, *Essentials of Economics*, p. 66:

**Market:** a group of buyers and sellers of a particular good or service.

**Competitive market:** a market in which there are many buyers and many sellers so that each has a negligible impact on the market price.

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Mankiw, Gregory, *Essentials of Economics*, 2012, p. 256:

- 1) There are **many buyers and many sellers** in the market
- 2) The goods offered by the various sellers are **largely the same**
- 3) Firms can freely enter or exit the market

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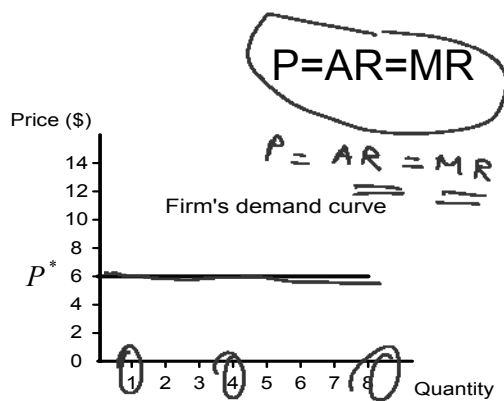
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Total, average and marginal revenues  
Same Same

Handwritten note:  $TR = P \times Q$

Quantity	Price	Total revenue	Average revenue	Marginal revenue
0 unit	\$6	\$0	-	-
1	6	6	\$6	\$6
2	6	12	6	6
3	6	18	6	6
4	6	24	6	6
5	6	30	6	6
6	6	36	6	6
7	6	42	6	6
8	6	48	6	6

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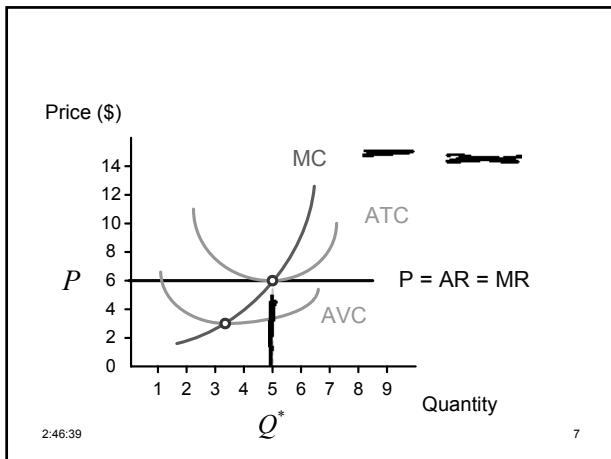
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Mankiw, Gregory, *Essentials of Economics*, 2012, p. 259: Profit maximization for a competitive firm

Quantity	Price	Total revenue	Total cost	Profit	Marginal revenue	Marginal cost	Marginal profit
0 unit	\$6	\$0	\$3	-\$3	—	—	—
1	6	6	5	1	\$6	\$2	\$4
2	6	12	8	4	6	3	3
3	6	18	12	6	6	4	2
4	6	24	17	7	6	5	1
5	6	30	23	7	6	6	0
6	6	36	30	6	6	7	-1
7	6	42	38	4	6	8	-2
8	6	48	47	1	6	9	-3

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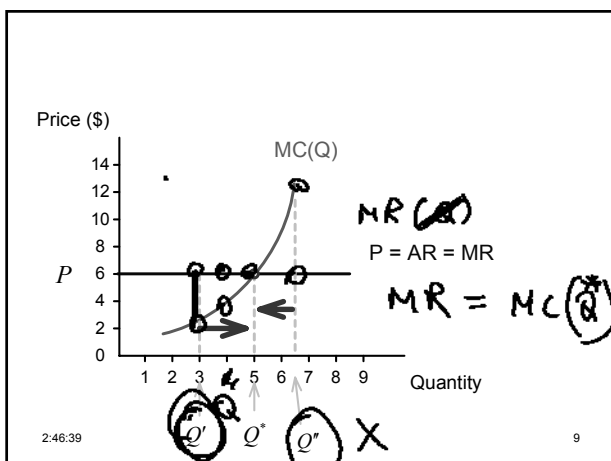
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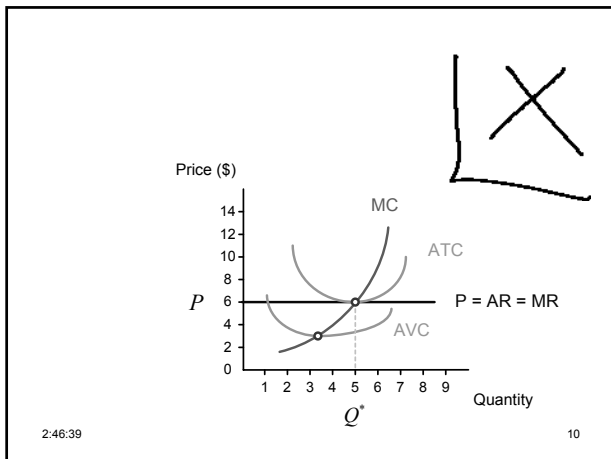
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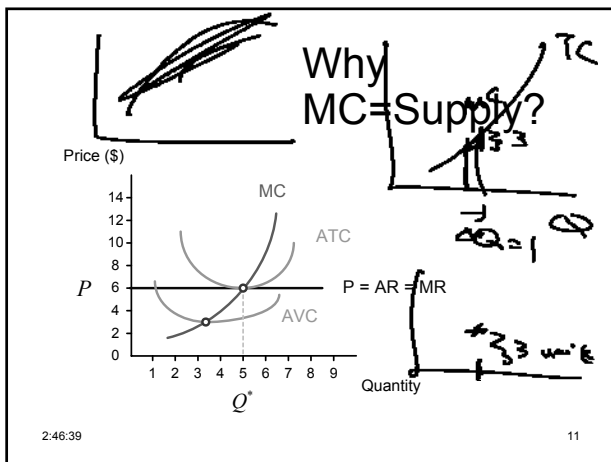
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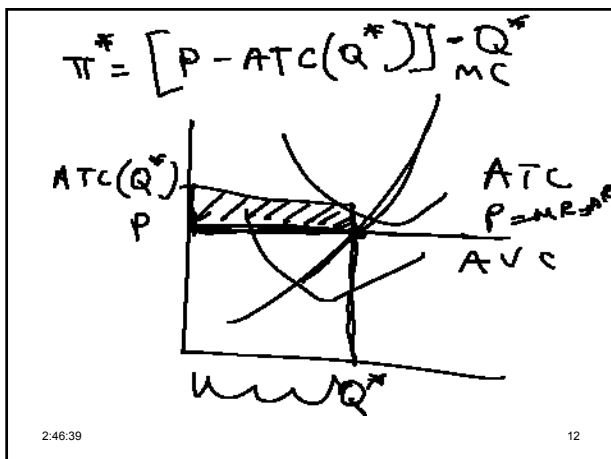
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$$\begin{aligned}\pi^* &= TR - TC \\ &= \pi(Q^*) = AR \times Q^* - ATC \times Q^* \\ &= P \times Q^* - ATC \times Q^*\end{aligned}$$

## Profit/ Loss

$$\text{Profit / Loss} = [P - ATC(Q)] \times Q$$

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A firm shuts down (in the short run) if the price of the good is less than the average variable cost.

than the average variable cost.

$TR < TVC < TC$

"Shut down" iff  $TR < TVC$  ( $< Q$ )

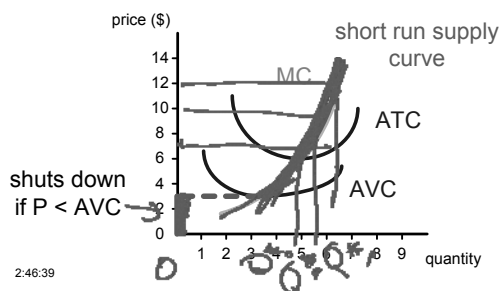
$\Leftrightarrow$  "Shut down" iff  $\frac{TR}{Q} < \frac{TVC}{Q}$  ( $< \frac{TC}{Q}$ )

$\Leftrightarrow$  "Shut down" iff  $P < AVC$  ( $< ATC$ )

$P < AVC$

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A firm exits (in the long run) if the price of the good is less than the average total cost.

$$TVC < TR < TC$$

$$\text{"Exit" iff } TVC < TR < TC$$

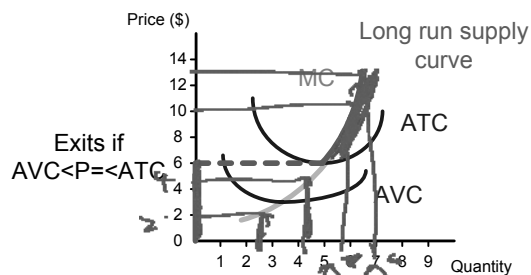
$$\Leftrightarrow \text{"Exit" iff } \frac{TVC}{Q} < \frac{TR}{Q} < \frac{TC}{Q}$$

$$\Leftrightarrow \text{"Exit" iff } AVC < P < ATC$$

$AR = P$

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1) A firm **exits** (in the long run) (and stays in the short run) if the price of the good is larger than the average variable cost but less than the average total cost.

2) A firm **shuts down** (in the short run) if the price of the good is less than the average variable cost.

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A competitive firm's **long-run supply curve** is the portion of its marginal cost curve that lies above average total cost.

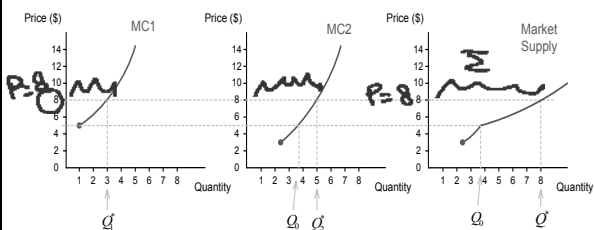
A competitive firm's **short-run supply curve** is the portion of its marginal cost curve that lies above average variable cost.

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Market supply curve:

## Market supply



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24 hr 16 hr 24 hr  
 Pindyck and Rubinfeld, 2013, p.241  
 Production costs for aluminum smelting (\$/ton) (Fixed cost of the smelting plant is over \$1B):

Per-ton costs that are constant for all output levels	Output: 600 tons / day	Output: 600 tons / day
Electricity	\$316	\$316
Alumina	369	369
Other raw materials	125	125
Plant power and fuel	10	10
Subtotal	\$820	\$820
Per-ton costs that increase when output exceeds 600 tons / day		
Labor	\$150	\$225
Maintenance	120	180
Freight	50	75
Subtotal	\$320	\$480
Total per-ton production cost	\$1,140	\$1,300

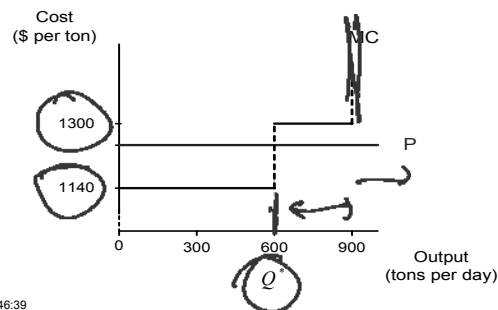
This example is based on Kenneth S. Cort, "The Aluminum Industry in 1994," Harvard Business School Case N9-799-129, April 1999.

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Pindyck and Rubinfeld, 2013, p.241:



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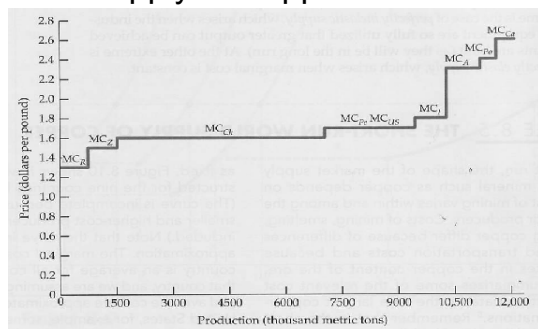
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## The Supply of Copper



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Pindyck and Rubinfeld, 2013, p. 298:

**Producer surplus:** is the sum over all units produced by a firm of differences between the market price of a good and the marginal cost of production.

$$PS = P - c$$

$$PS = P - MC$$

Equivalently, producer surplus measures the area above a producer's supply curve and below the market price.

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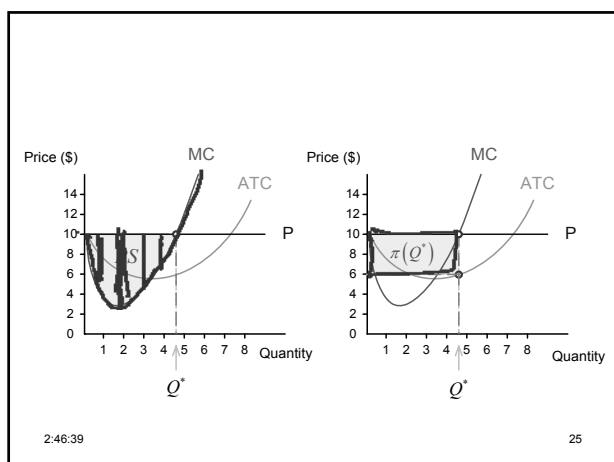
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$$\pi = TR - TC$$

$$= (P - ATC)Q$$

$$\quad \quad \quad \wedge$$

$$\quad \quad \quad AVC + AFC$$

$$\quad \quad \quad PS \quad FC$$

$$\pi = \{P - AVC - AFC\} \times Q$$

$$= [P - AVC]Q - AFCQ$$

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