

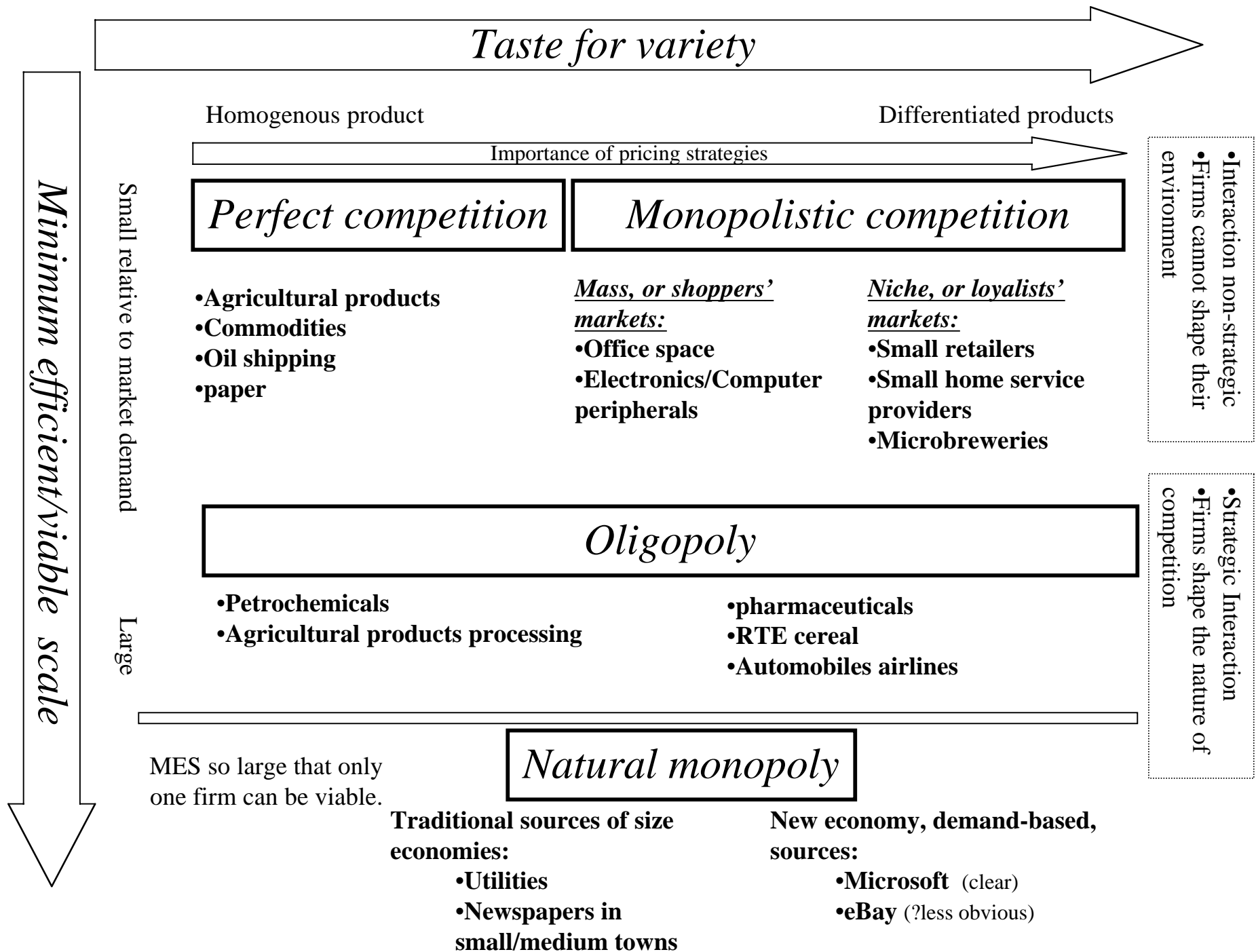
# Microeconomic Analysis

## Review of:

- market structures*
- economic drivers of profitability*
- perfect competition*

Professor Nabil I. Al-Najjar

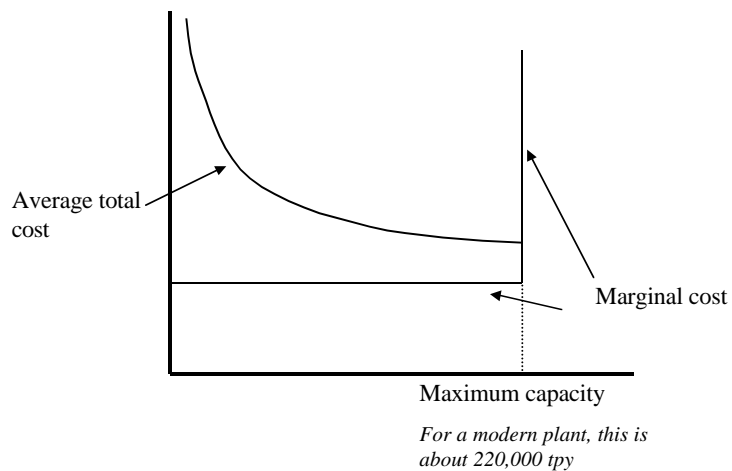
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## Important cost concepts

- ❖ **Average variable cost (AVC):** direct cost that can be avoided by changing output level (including shutting down production in the short-run)
  - ◆ sometimes referred to as *cash cost*, or *direct cost*
- ❖ **Average total cost (ATC):** includes AVC plus the *opportunity cost* of all assets currently committed to the industry
- ❖ **Full-reinvestment ATC (F-R ATC):** includes ATC plus the per unit, annualized value of all investments necessary to acquire these assets by a new firm
  - ◆ This differs from ATC by sunk cost, converted to annual capital charge

## Average variable cost with a 'hard' capacity constraint: *Aluminum smelters*



## Firm vs. industry supply

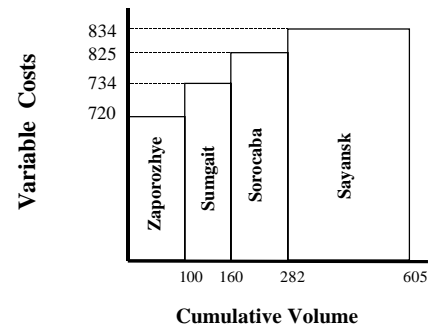
- ❖ The supply of *each firm* is
  - ◆ 0 output when the price is *below* its AVC
  - ◆ Its full capacity when the price *exceeds* its AVC
- ❖ But the industry consists of many firms (157) with different cost structures.
- ❖ *What is the industry supply in this case?*

## Cost analysis

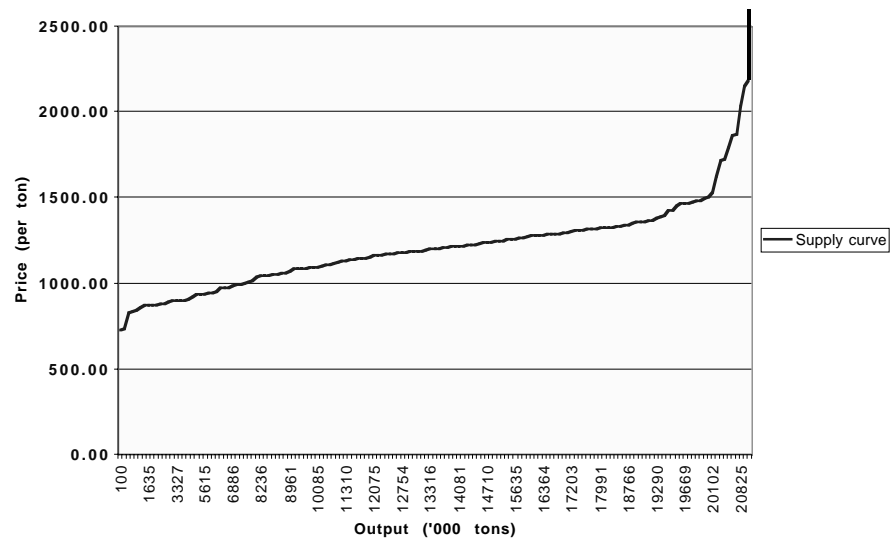
	Alba Bahrain State	Alba 3 Bahrain State	Alcasa Venezuela CVG
	221	230	210
Electricity usage (kWh/t)	16,000	13,949	16,864
Electricity price (\$/kWh)	0.01	0.013	0.012
<i>Total electricity cost:</i>	<i>204.99</i>	<i>178.71</i>	<i>196.37</i>
Alumina usage (t/t Al)	1.93	1.92	1.94
Alumina price (\$/t Alumina)	191.70	191.70	210.06
<i>Total alumina cost:</i>	<i>369.99</i>	<i>368.07</i>	<i>406.67</i>
Other raw materials	113.74	103.37	184.34
Plant power and fuel	2.75	2.75	12.68
Consumables	50.98	50.92	110.74
Maintenance	38.55	37.46	40.72
Labor	107.42	55.07	67.77
Freight	38.00	38.00	27.14
General and administrative	67.17	63.77	42.04

### Example of industry supply with four firms

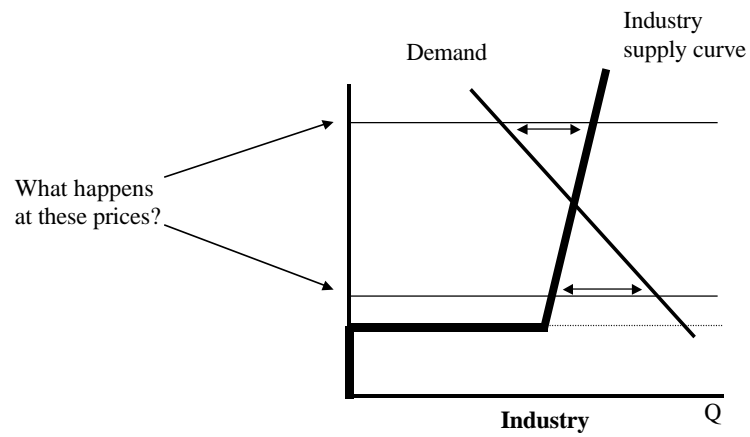
Firm	Capacity	Cumulative capacity	AVC
Zaporozhye	100	100 ↓	720
Sumgait	60 →	160	734
Sorocaba	122	282	825
Sayansk	323	605	834



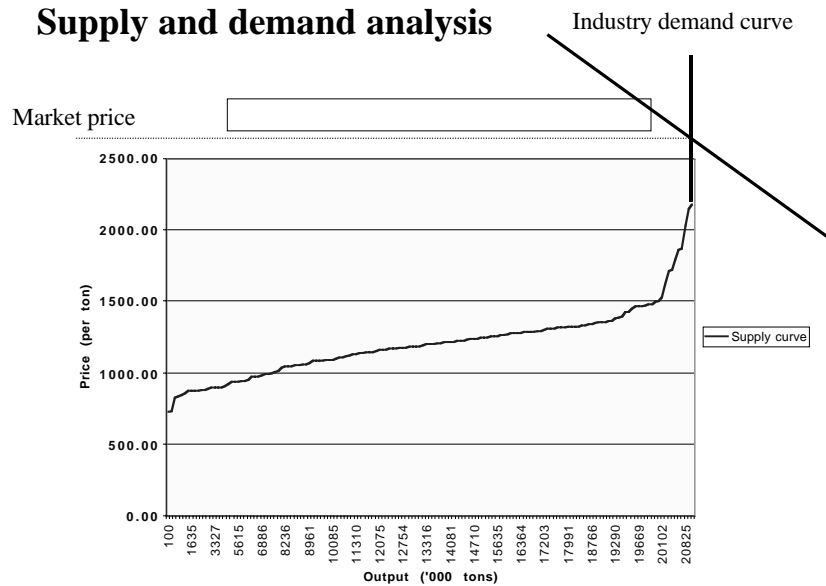
### Short-run Supply Curve for Primary Aluminum



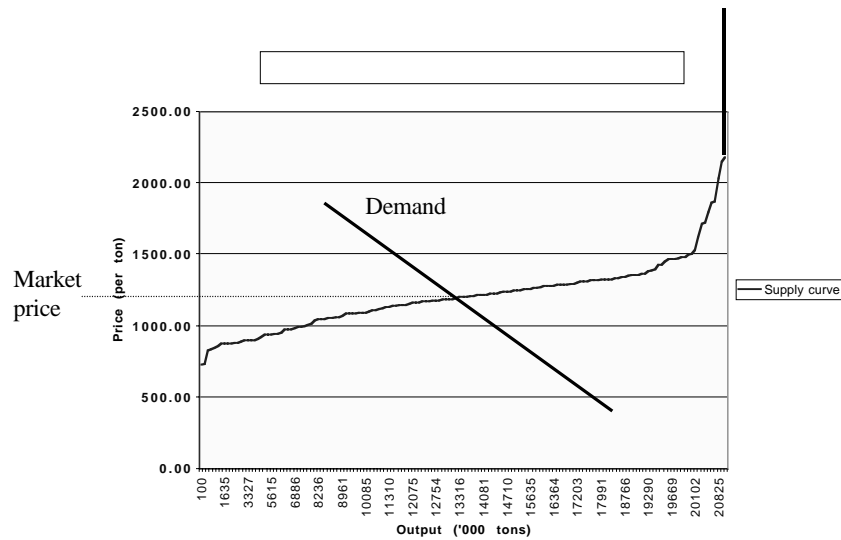
## Supply and demand



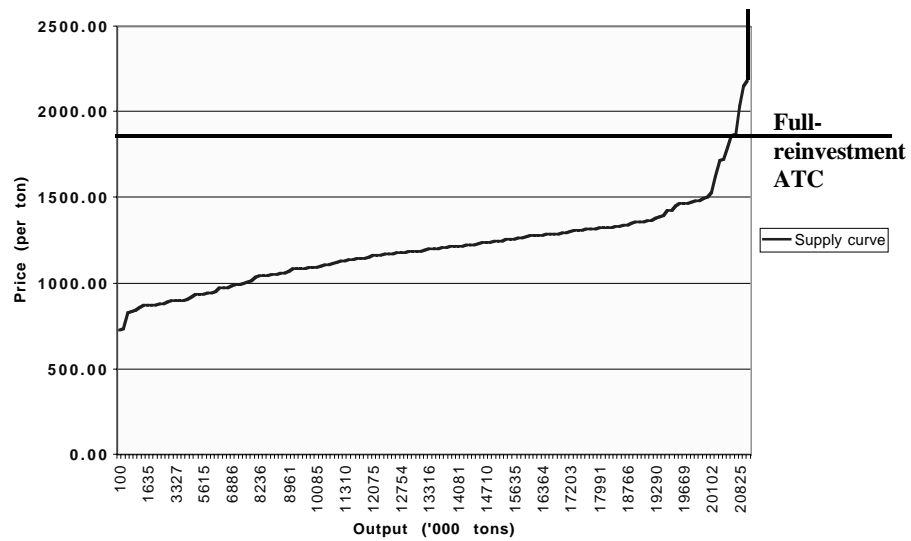
## Supply and demand analysis



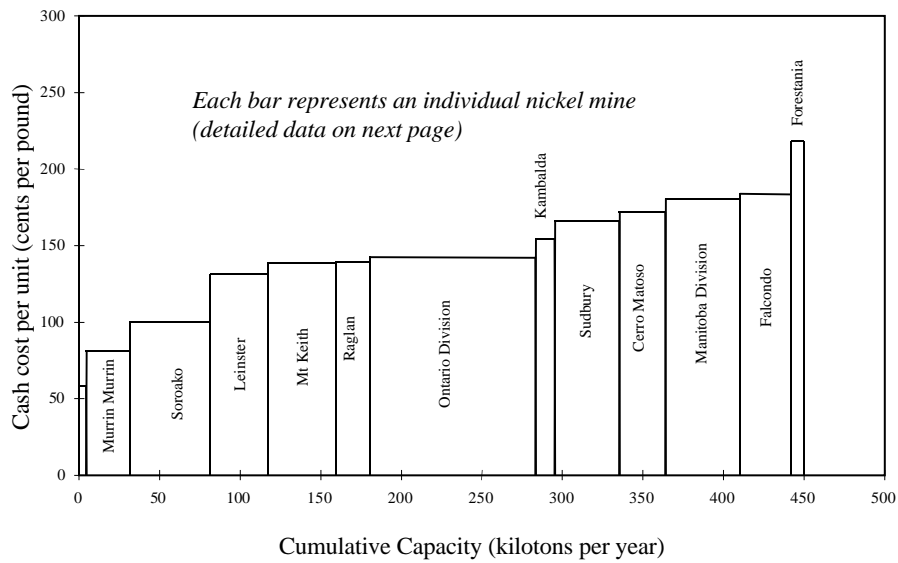
## Supply and demand analysis



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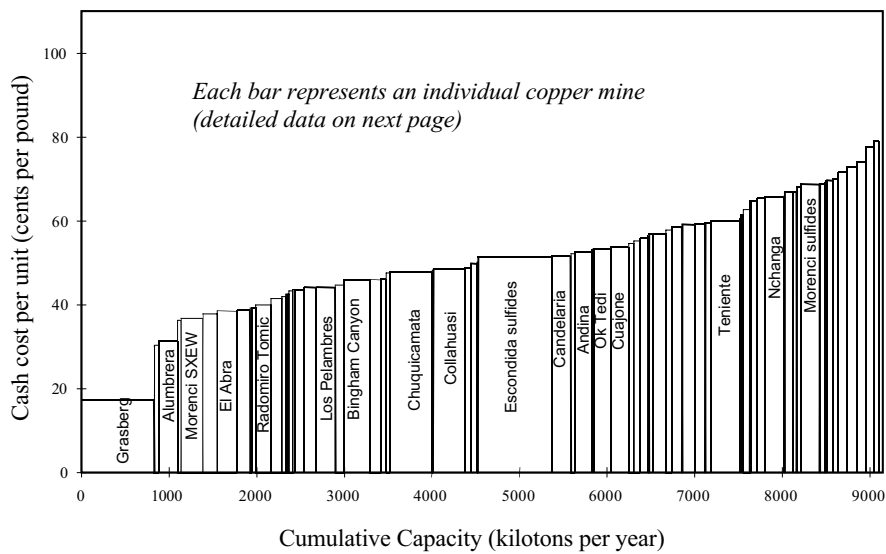


## Cash Costs By Nickel Mine in Global Nickel Industry: 1999



source: Minecost.com  
World Mine Cost Data Exchange

## Cash Costs By Copper Mine in Global Copper Industry: 1999



source: Minecost.com  
World Mine Cost Data Exchange