MICROECONOMICS II

Topic 6 - Industry supply

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Market demand curve

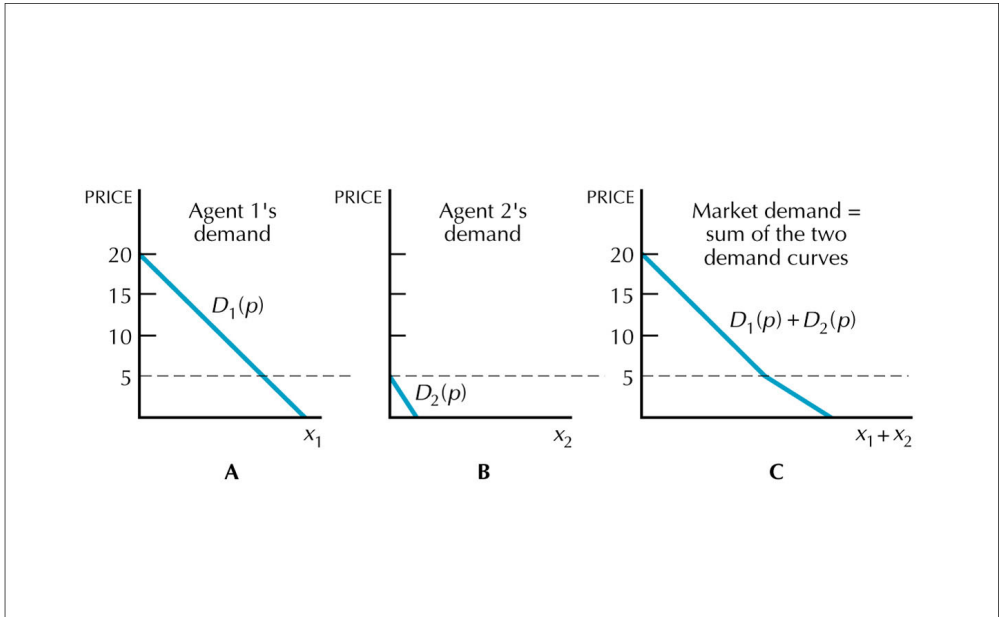
Aggregate demand: sum of all individual demands

- $X^1(p_1, p_2, m_1, ..., m_n) = \Sigma x_i^1(p_1, p_2, m_i)$
- Depends on prices and distribution of incomes.
- For representative consumer: $X^1(p_1, p_2, M)$

Fix p_2 and income: construct market demand curve.

- Higher p_2: shift outward for substitutes, inward for complements.
- Higher income: shift outward for normal good.

Inverse demand function: horizontal sum of individual functions.



Market demand curve

The slope determined by:

- Adjustment on the intensive margin.
  - Negative for ordinary good.
  - May be positive if, at some price levels, the good is Giffen good for large number of consumers.
- Adjustment on the extensive margin (number of consumers).
  - Marginal consumer

Price goes down: people buy more and the number of consumers increases.

Usually, the market demand is downward sloping. We do not distinguish between long- and short-run demand curve.

Short-run market supply curve

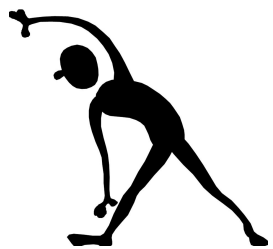
Important distinction between short- and long-run.

- Nature of inputs and decision-making process.
- Entry to and exit from the industry.

Short-run industry supply curve: sum of individual supply curves.

- Fixed number of firms.
- $S(p) = \Sigma S_i(p)$
- Graphically, horizontal sum of inverse supply curves.

SHORT-RUN MARKET SUPPLY CURVE



Exercise

In the short-run, there are 100 firms in the industry with identical cost functions: $STC(y) = y^2 + 30y + 400$

- Derive the industry supply $S(p)$.
- What is the output produced by the industry at $p = 80$?

SHORT-RUN EQUILIBRIUM

Intersection of the market supply and market demand curves.

Some firms make zero profit, some positive, some negative.

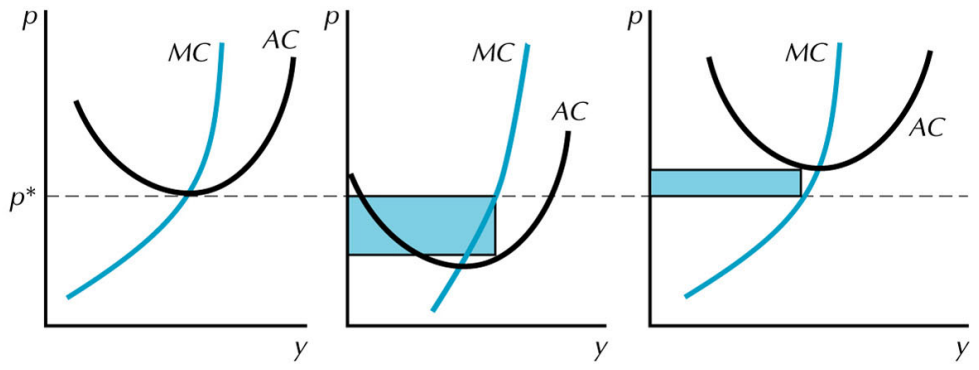


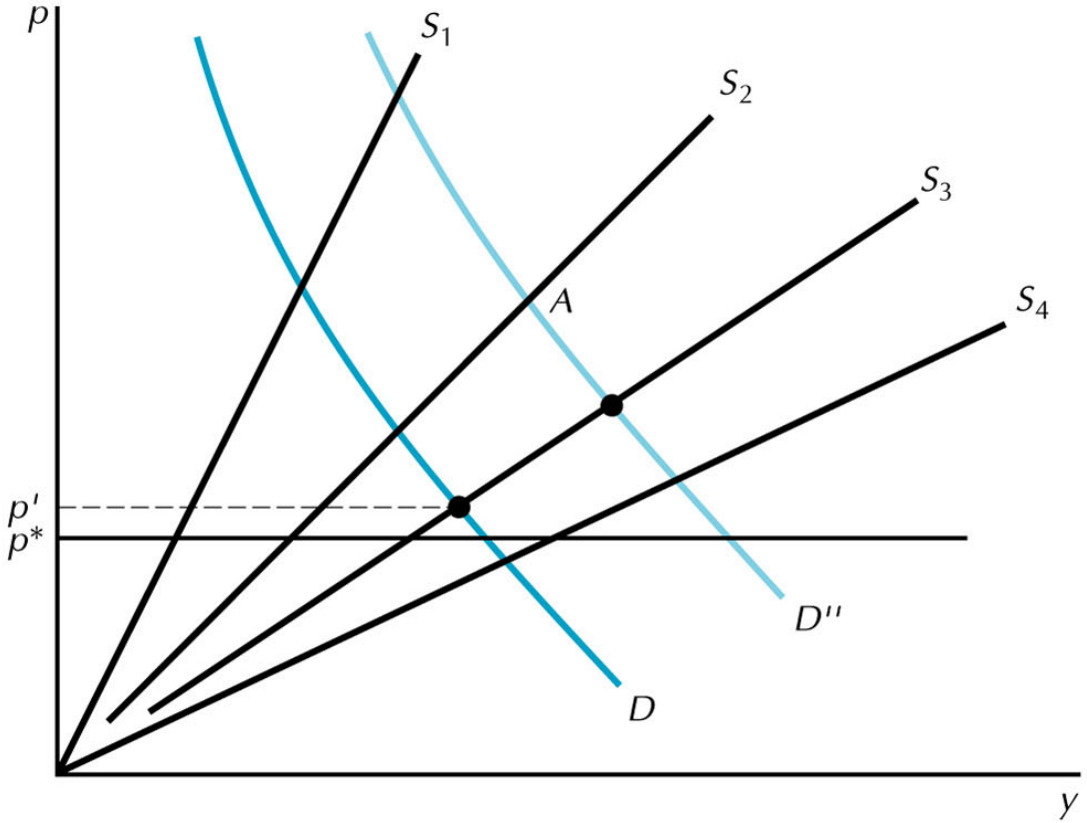
FIGURE 23.2 Short-run equilibrium

Intermediate Microeconomics, 8th Edition

Long-run equilibrium

Entry-free industry

- Firms enter and exit depending on the profit. Total output changes and market price changes as well. Entry or exit may follow.



LONG-RUN MARKET SUPPLY CURVE

Not the sum of individual long-run supply curves because of free entry and exit.

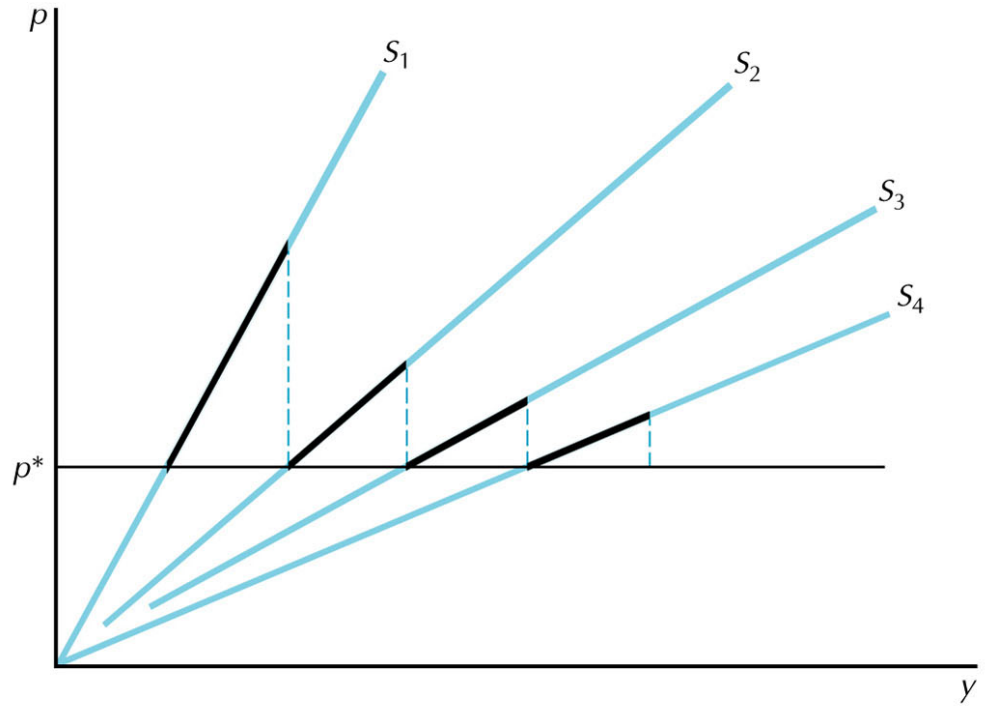


FIGURE 23.4 The long-run supply curve

Long-run market supply curve

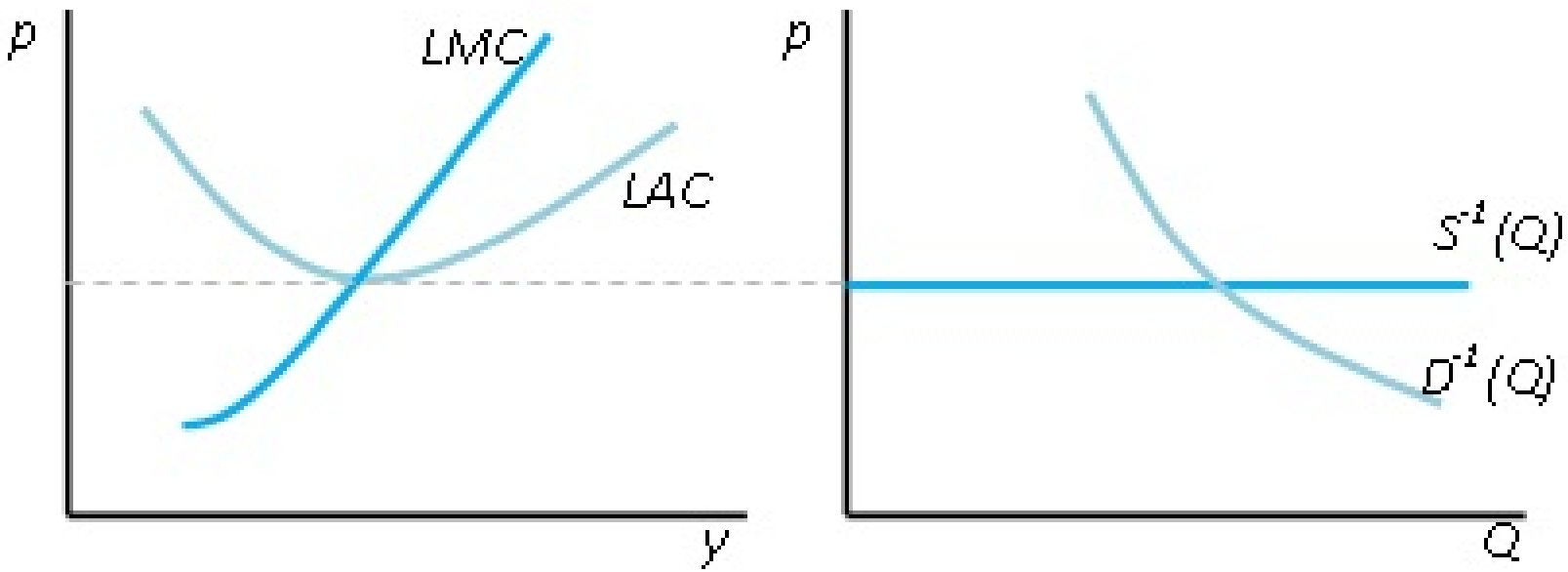
Can be approximated by a horizontal line at price equal to minimum average costs.

- Zero profit. Positive profit would induce entry of other firms.
- In the long-run, output is determined solely by the market demand.
- Demand change: output does not change due to change in individual supplies, but due to change in the optimal number of firms in the industry.

Long-run market supply curve

Concave-convex *LTC* curve, U-shaped *LAC* curve.

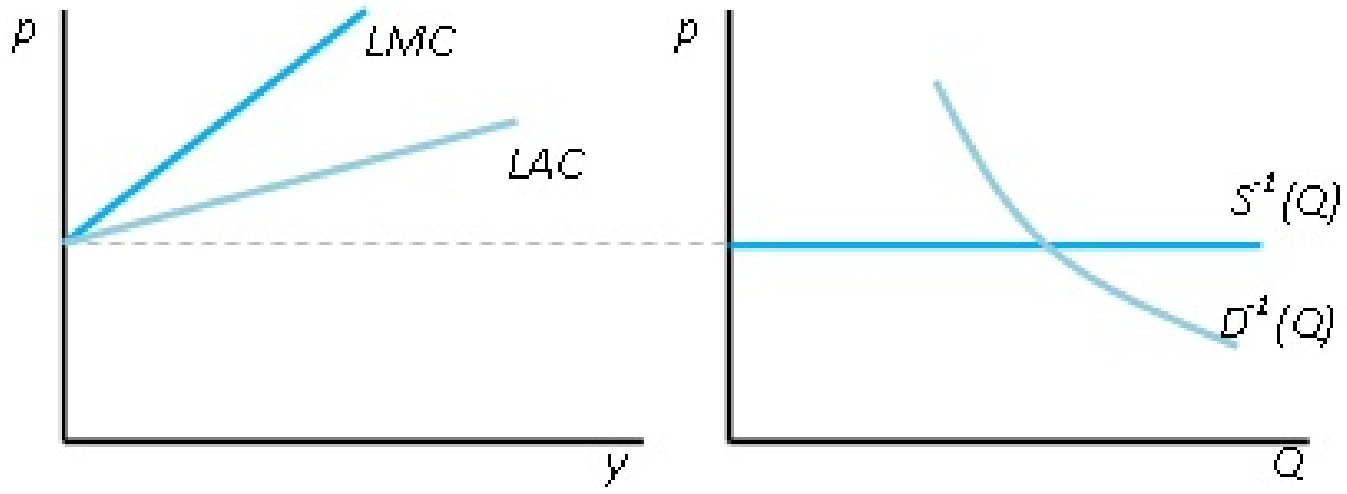
- Firms willing to produce positive output and earn zero profit.



Long-run market supply curve

Convex *LTC* curve.

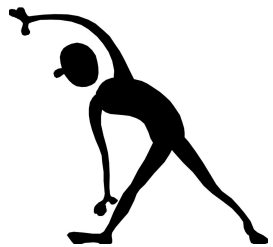
- *LMC* and *LAC* increasing at all output levels.
- Infinite number of firms, each producing infinitely small output.



Concave *LTC* curve.

- *LMC* and *LAC* decreasing at all output levels.
- Monopoly.

Long-run market supply curve



Exercise

Firms with identical cost function: $LTC(y) = 2y^3 - 30y^2 + 150y$.

Market demand $D_q(p) = 1500 - 4p$.

- Determine the inverted long-run supply curve $p = S_Q^{-1}(y^*)$.
- Determine the total output supplied by the industry in the long-run.
- What is the equilibrium number of firms in the industry?

Entry and exit, application

Hsieh and Moretti, 2003. Can Free Entry be Inefficient? Fixed Commissions and Social Waste in the Real Estate Industry, *Journal of Political Economy*.

Residential real estate brokerage in US.

- Commissions the same everywhere. It seems better to be an agent in cities with high house prices.
- However, average salary is the same everywhere.
- Reason: free entry and exit.
  - An agent in a city with high house prices sells fewer houses.
  - In such a city, more people decide to become real estate agents.
  - The study found this pattern across cities, as well as within cities over time.

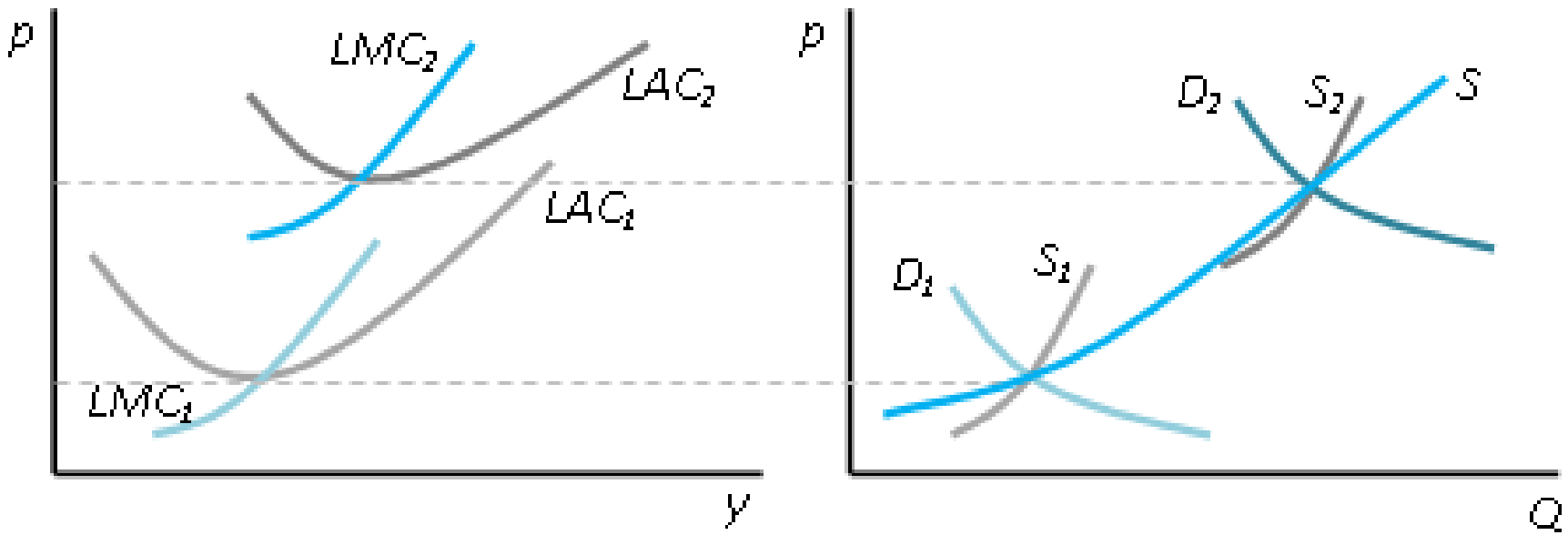
External pecuniary economies of scale

Costs not constant when the output of the industry goes up (due to change in the demand of the industry for inputs).

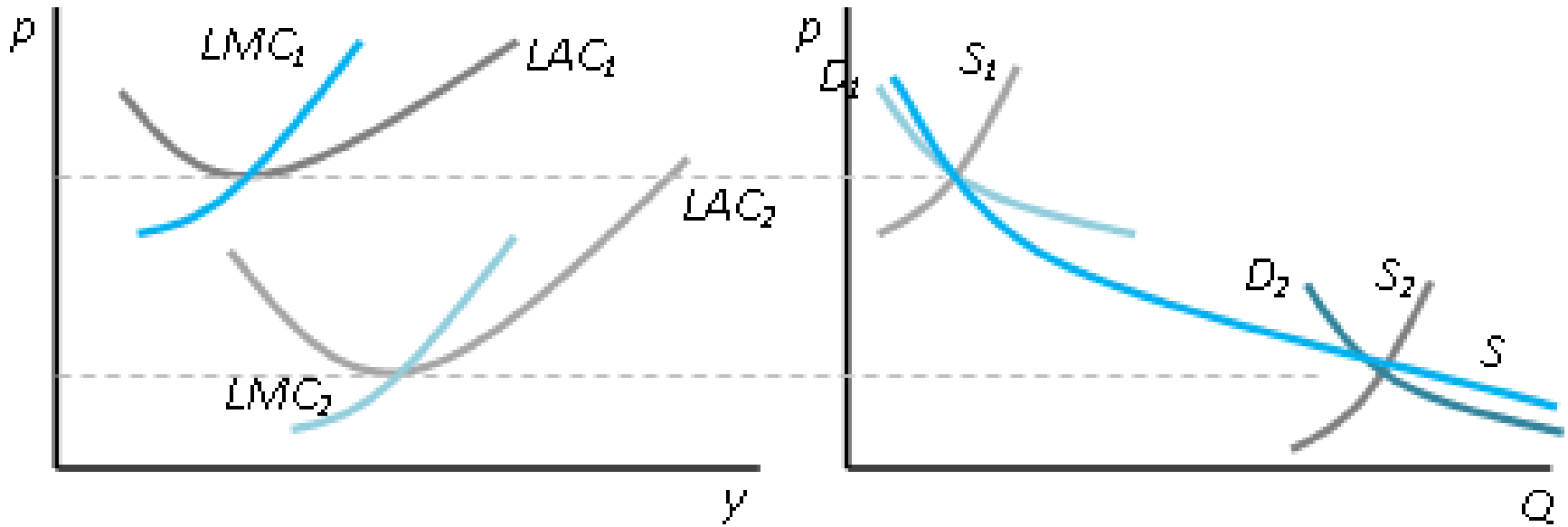
Individual firms cannot affect the input price, whole industry can.

- Negative external pecuniary economies of scale: input becomes more expensive.
  - Example: metal as an input.
- Positive external pecuniary economies of scale: input becomes cheaper.
  - Example: stronger bargaining power of more firms against suppliers who have increasing returns to scale.

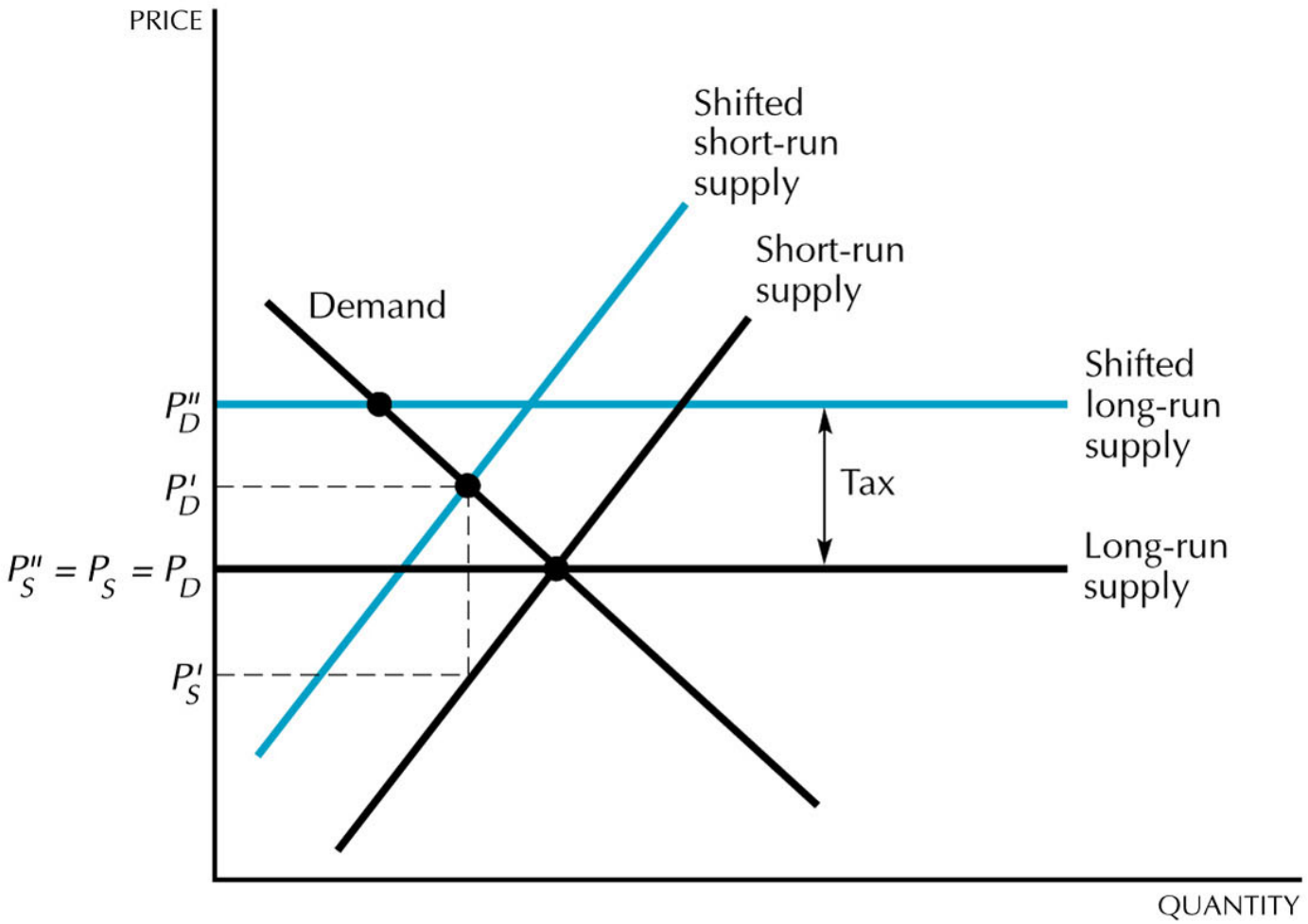
Negative external pecuniary economies of scale



Positive external pecuniary economies of scale



Taxes


PRICE
Shifted short-run supply
Short-run supply
Demand
Shifted long-run supply
P''_D
P'_D
Tax
$P''_S = P_S = P_D$
Long-run supply
P'_S
QUANTITY

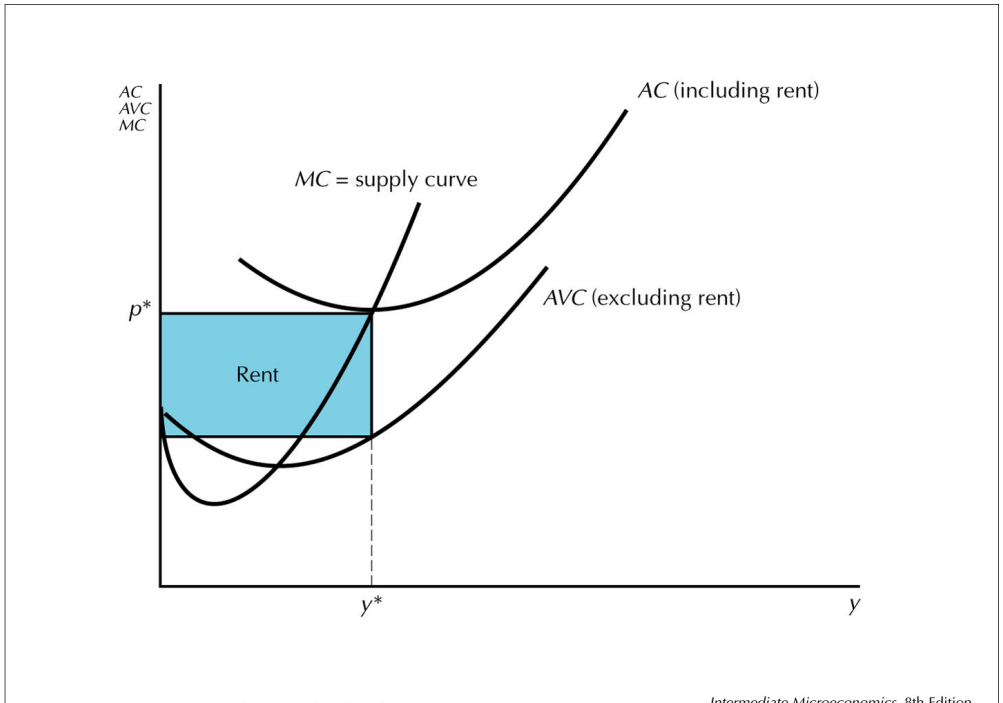
Economic rent

Payment to a factor of production that is in excess of the minimum payment necessary to have the factor supplied.

- $p^*y^* - c_v(y^*) - rent = 0$

Rent-seeking

- Artificial scarcity hard to eliminate.
- Firms attempt to maintain their position.
- Deadweight loss due to expenses on lobbying, lawyers' fees,etc.

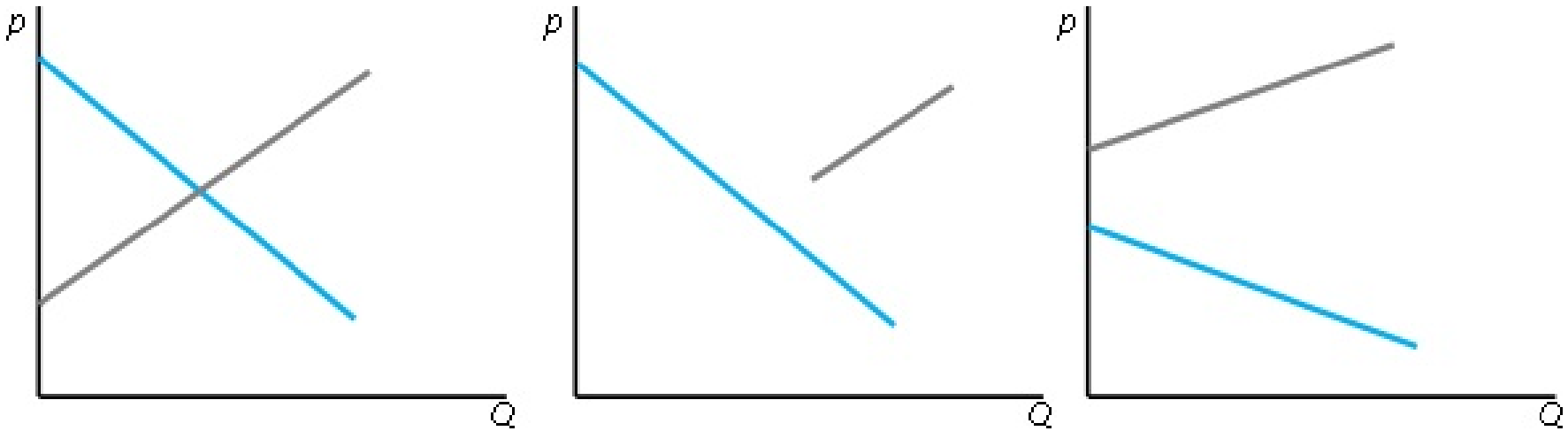


EQUILIBRIUM

Interaction of market demand and supply: equilibrium market price.

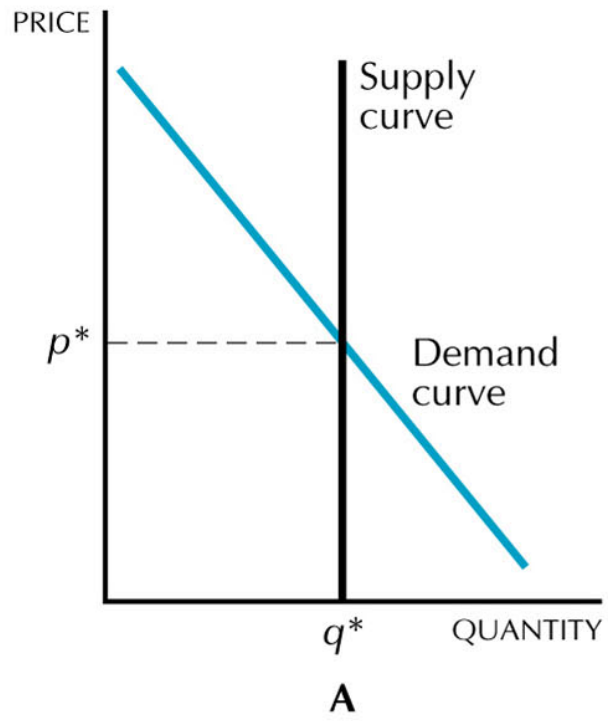
- Graphically: point where the curves cross.
- Algebraically: $D(p^*) = S(p^*)$ or $P_S(q^*) = P_D(q^*)$

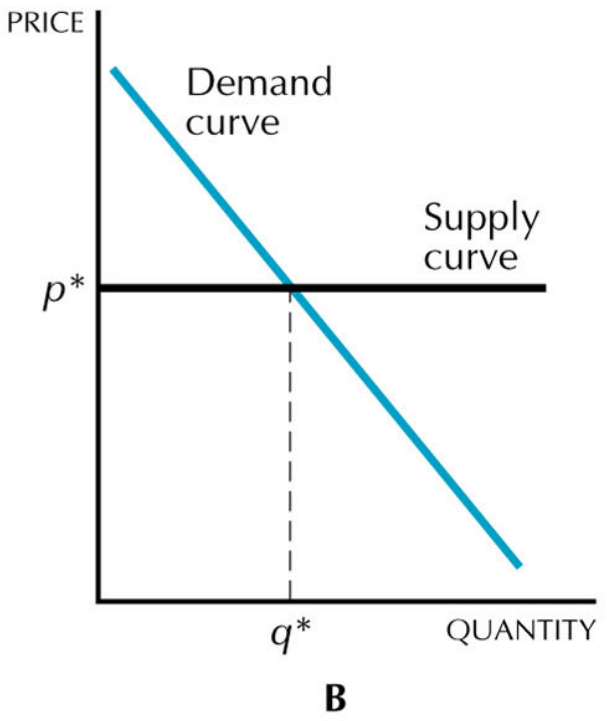
Existence of equilibrium



EQUILIBRIUM

Special cases: vertical and horizontal supply curve



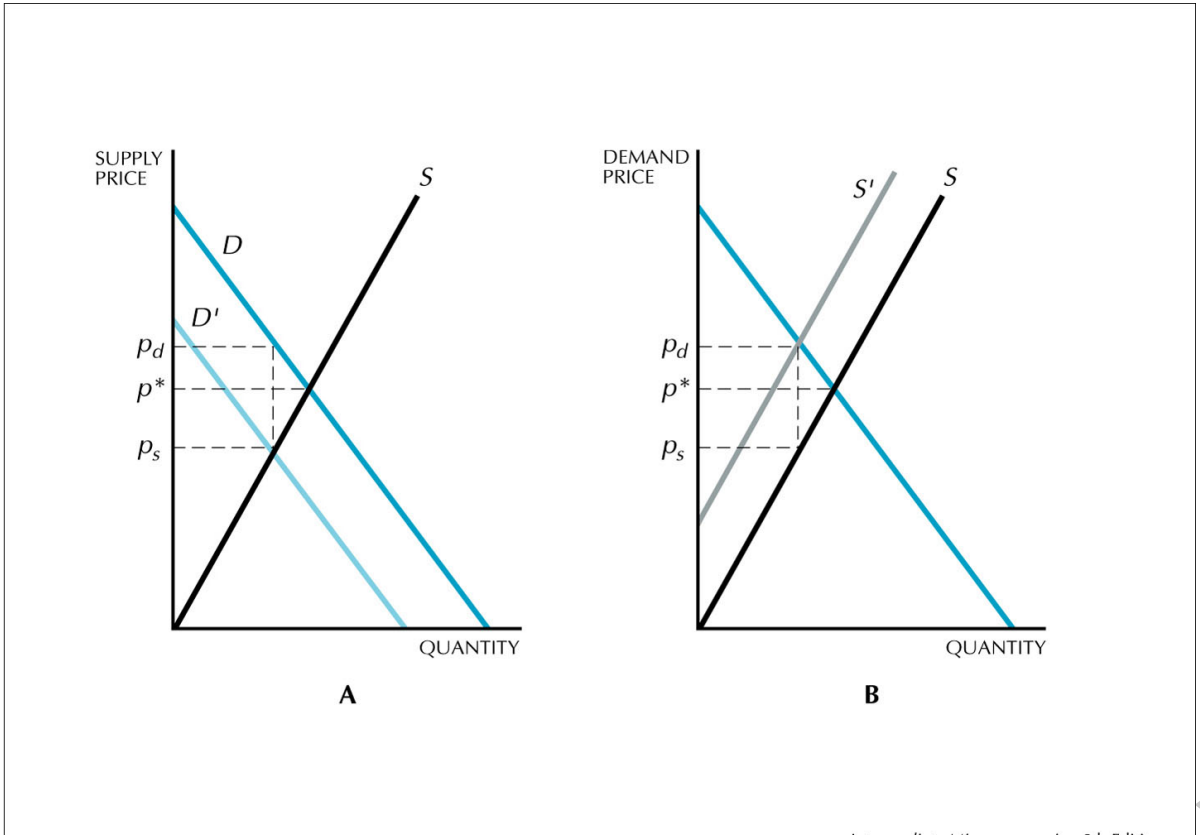


EQUILIBRIUM - COMPARATIVE STATICS

Change in equilibrium due to change in demand and supply.

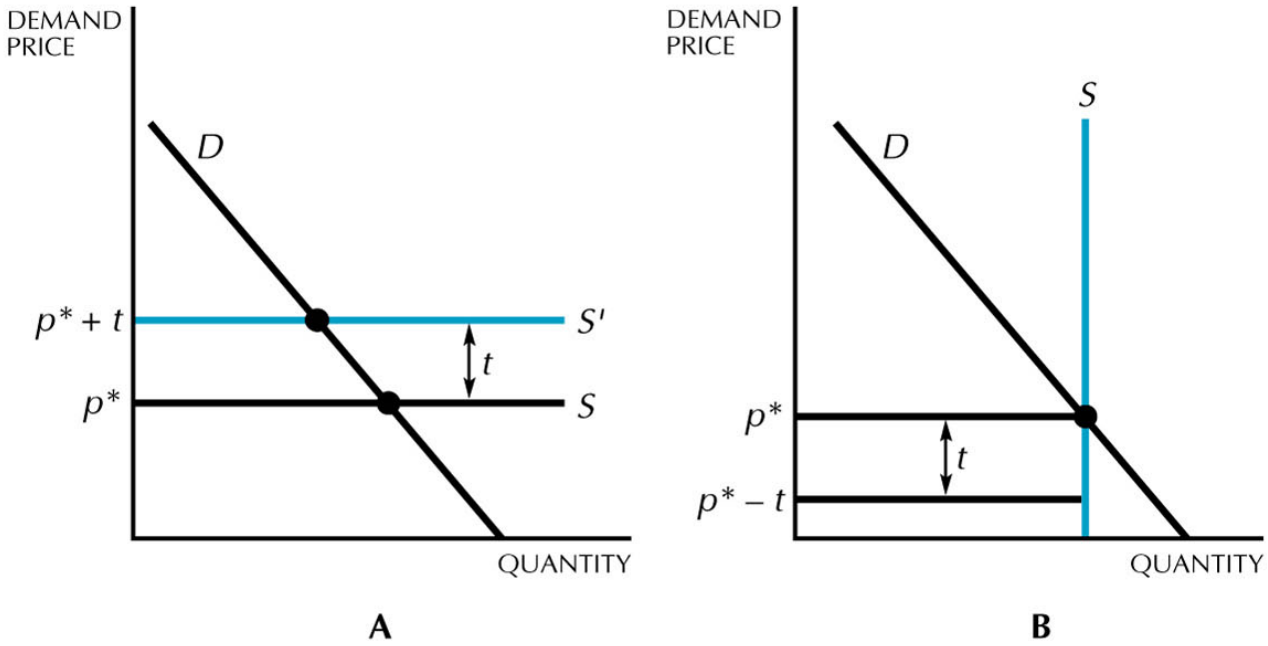
Taxes

- Two prices of interest (paid by consumers, received by producers).
- Does not matter who pays the tax.



EQUILIBRIUM - COMPARATIVE STATICS

Passing along the tax: depends on relative elasticity of the demand and supply curves.



EQUILIBRIUM - COMPARATIVE STATICS

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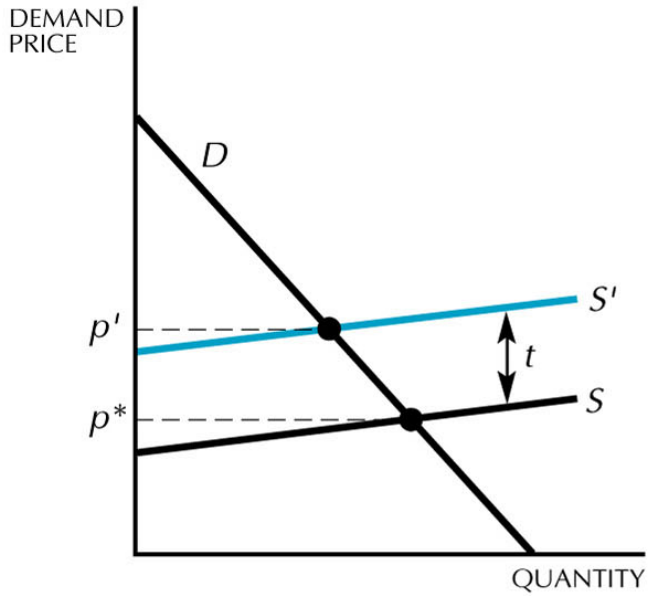
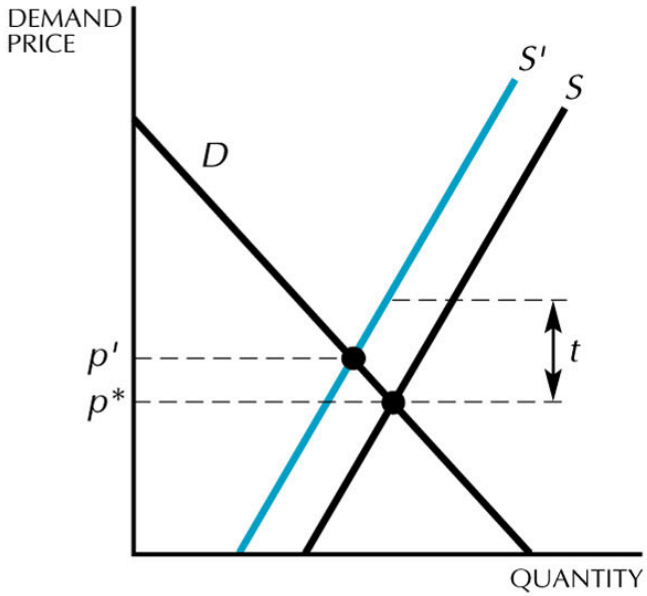


A



B

EQUILIBRIUM - COMPARATIVE STATICS

Deadweight loss, excess burden of the tax.

- Loss in consumer surplus $A + B$
- Loss in producer's surplus $C + D$
- Government revenue from the tax $A + C$
- Deadweight loss $B + D$

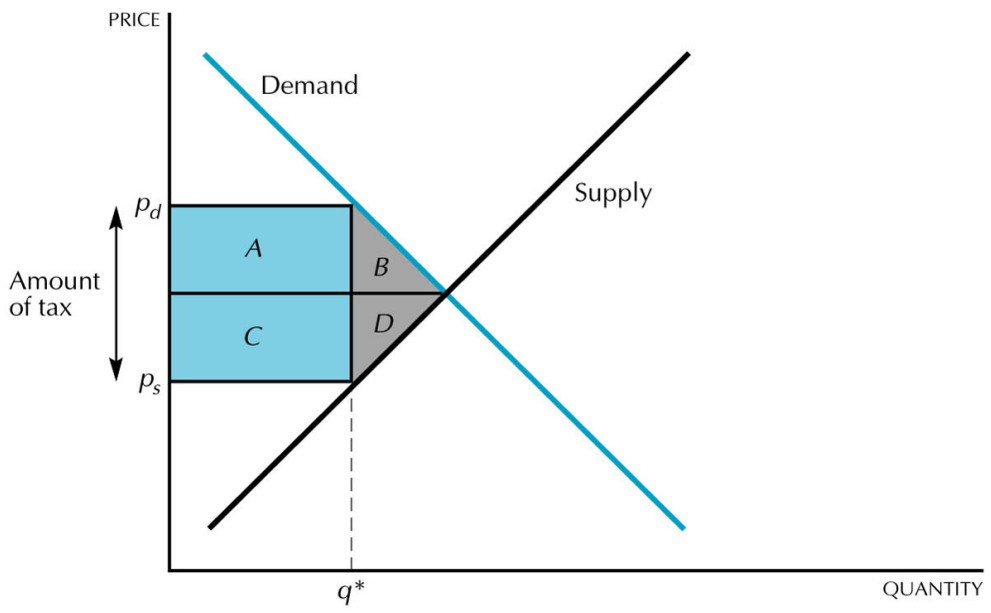
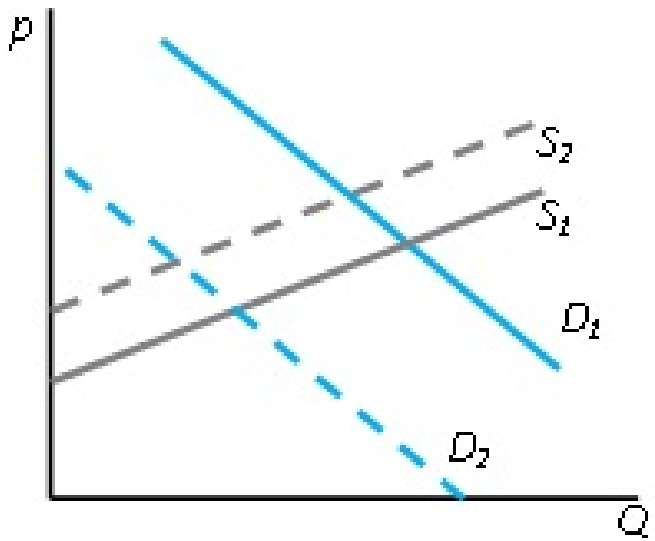


FIGURE 16.7 The deadweight loss of a tax

Comparative statics, other examples

Market for illegal drugs

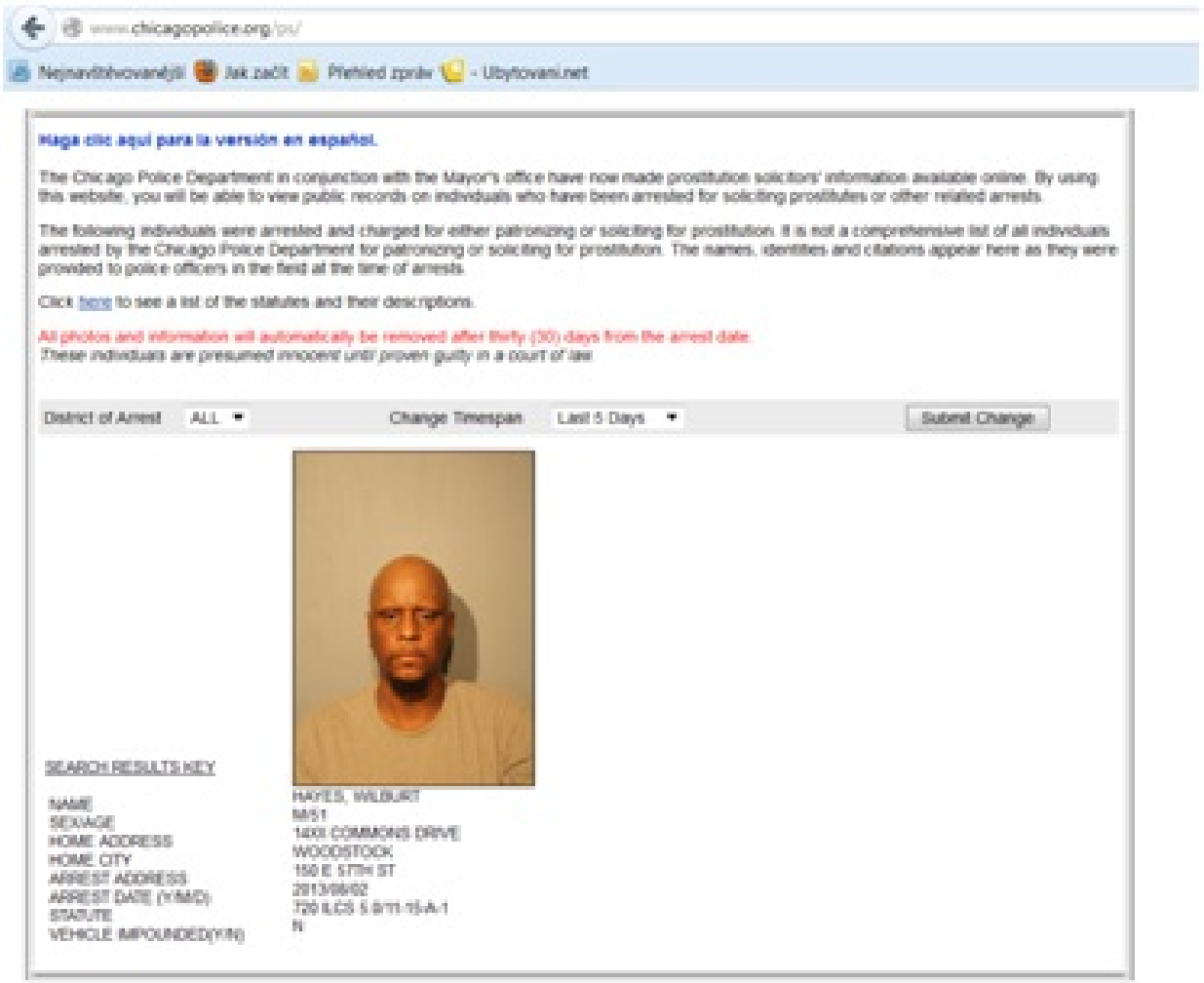
- Government affects the probability of prosecution, thus the market price and quantity.
- Higher probability that a dealer is prosecuted: higher price, lower quantity.
- Is more efficient to prosecute dealers or users? Depends on how much the curves shift and on the relative elasticity of demand and supply.



COMPARATIVE STATICS, OTHER EXAMPLES

Ways to cut down on prostitution

- Arrest prostitutes
- Embarrass their clients



COMPARATIVE STATICS, OTHER EXAMPLES

Minimum wage

- Higher wage
- Excess supply of workers, unemployment. Critics argue this is partially responsible for incidence of crime among teenagers.
  - Let the wage back to market level.
  - Subsidies to firms who hire teenagers.

Exercise

- The mayor of a city thinks that if people get jobs, vandalism will reduce. At the same time thinks the market wage is too low.
- She keeps the minimum wage and pays subsidy for each worker hired $(w^{min} - w^a)$, where w^{min} is the minimum wage and w^a is the market clearing wage.
- Each unemployed causes damage $w^v - w^a$ where $w^v > w^{min}$.
- Will the subsidy save the city money?

Pure competition and efficiency

Pareto efficiency: any economic agent cannot get better off unless another one gets worse off.

- Price equals marginal cost and marginal willingness to pay. Nobody willing to pay for additional unit the amount for which somebody would be willing to produce it.
- Ratio of marginal utility and price is the same for all consumers. They cannot get better off by exchange of goods.
- Ratio of marginal product and price of inputs are the same for all producers. They cannot get better off by substituting one input for another.
- $p \cdot MP_i = w_i$ for all inputs. Producers cannot get better off by using more or less of an input.
- $p = LAC_i$ in each industry. Producers cannot get better off by moving into another industry.

Unrelated to distribution of welfare and inequality.