Microeconomic Theory I

Market efficiency and equilibrium

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The Theory of Economics does not furnish a body of settled conclusions immediately applicable to policy. It is a method rather than a doctrine, an apparatus of the mind, a technique of thinking which helps its possessor to draw correct conclusions

--- John Maynard Keynes

Economic Modeling

- **What causes what in economic systems?**
- **At what level of detail shall we model an economic phenomenon?**
- **Which variables are determined outside the model (exogenous) and which are to be determined by the model (endogenous)?**

Modeling the Apartment Market

- **How are apartment rents determined?**
- **Suppose**
  - **apartments are close or distant, but otherwise identical**
  - **distant apartments rents are exogenous and known**
  - **many potential renters and landlords**

Modeling the Apartment Market

- **Who will rent close apartments?**
- **At what price?**
- **Will the allocation of apartments be desirable in any sense?**

- **How can we construct an insightful model to answer these questions?**

Economic Modeling Assumptions

- **Two basic postulates:**
  - **Rational Choice: Each person tries to choose the best alternative available to him or her.**
  - **Equilibrium: Market price adjusts until quantity demanded equals quantity supplied.**

Modeling Apartment Demand

- **Demand: Suppose the most any one person is willing to pay to rent a close apartment is $500/month. Then**

  $$p = \$500 \Rightarrow Q^D = 1.$$

- **Suppose the price has to drop to $490 before a 2nd person would rent.**

  Then $p = \$490 \Rightarrow Q^D = 2.$

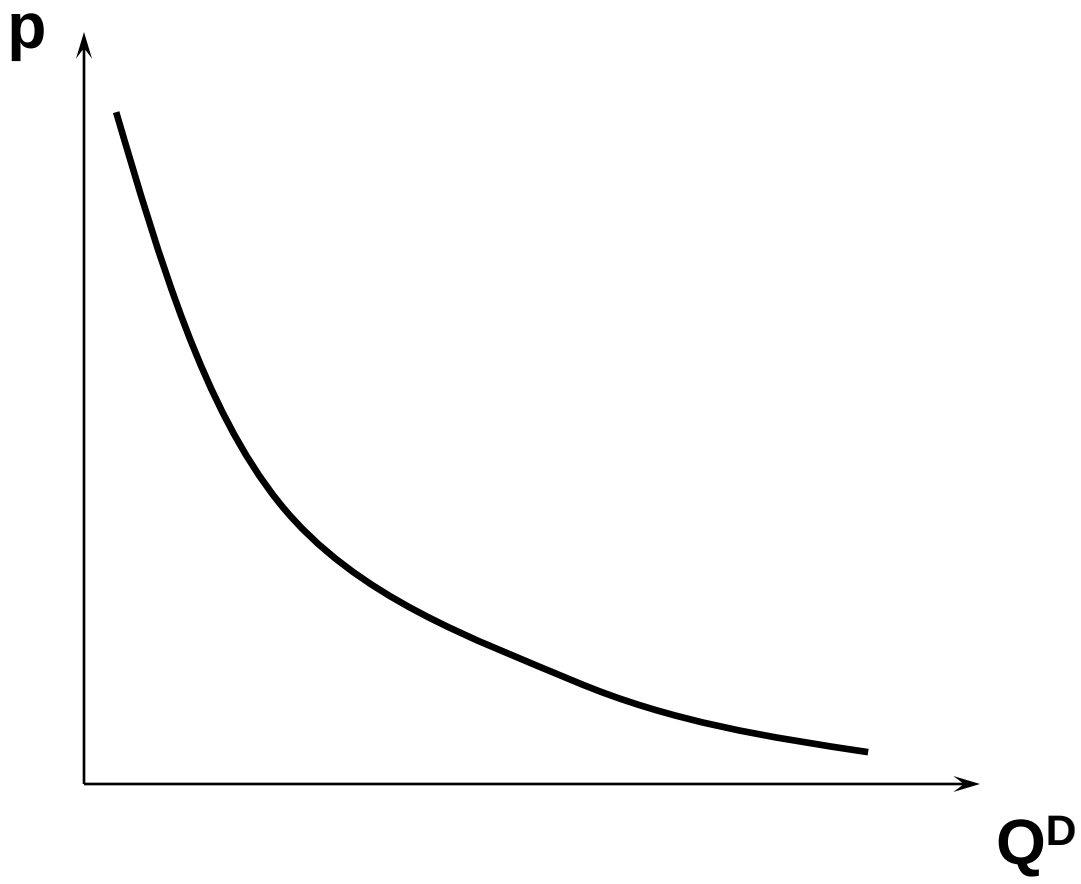
Modeling Apartment Demand

- **The lower is the rental rate p, the larger is the quantity of close apartments demanded**

$$p \downarrow \Rightarrow Q^D \uparrow.$$

- **The quantity demanded vs. price graph is the market demand curve for close apartments.**

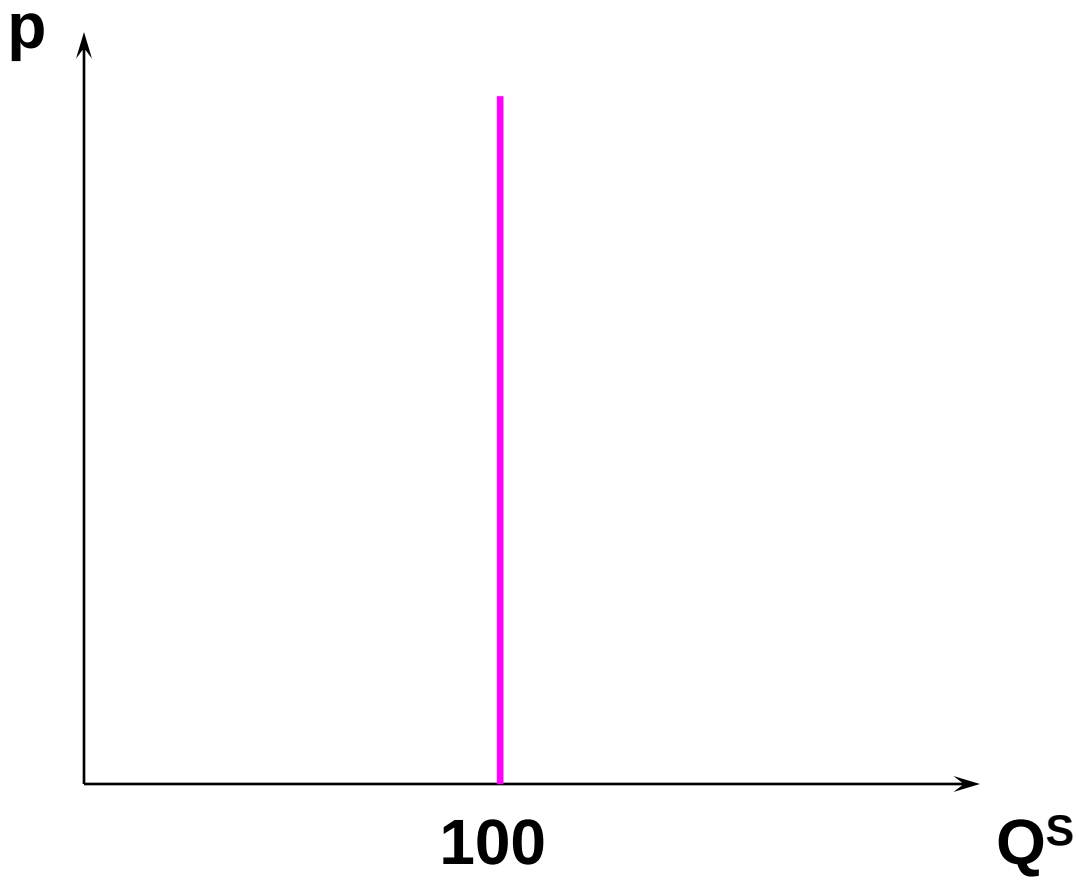
Market Demand Curve for Apartments



Modeling Apartment Supply

- **Supply: It takes time to build more close apartments so in this short-run the quantity available is fixed (at say 100).**

Market Supply Curve for Apartments



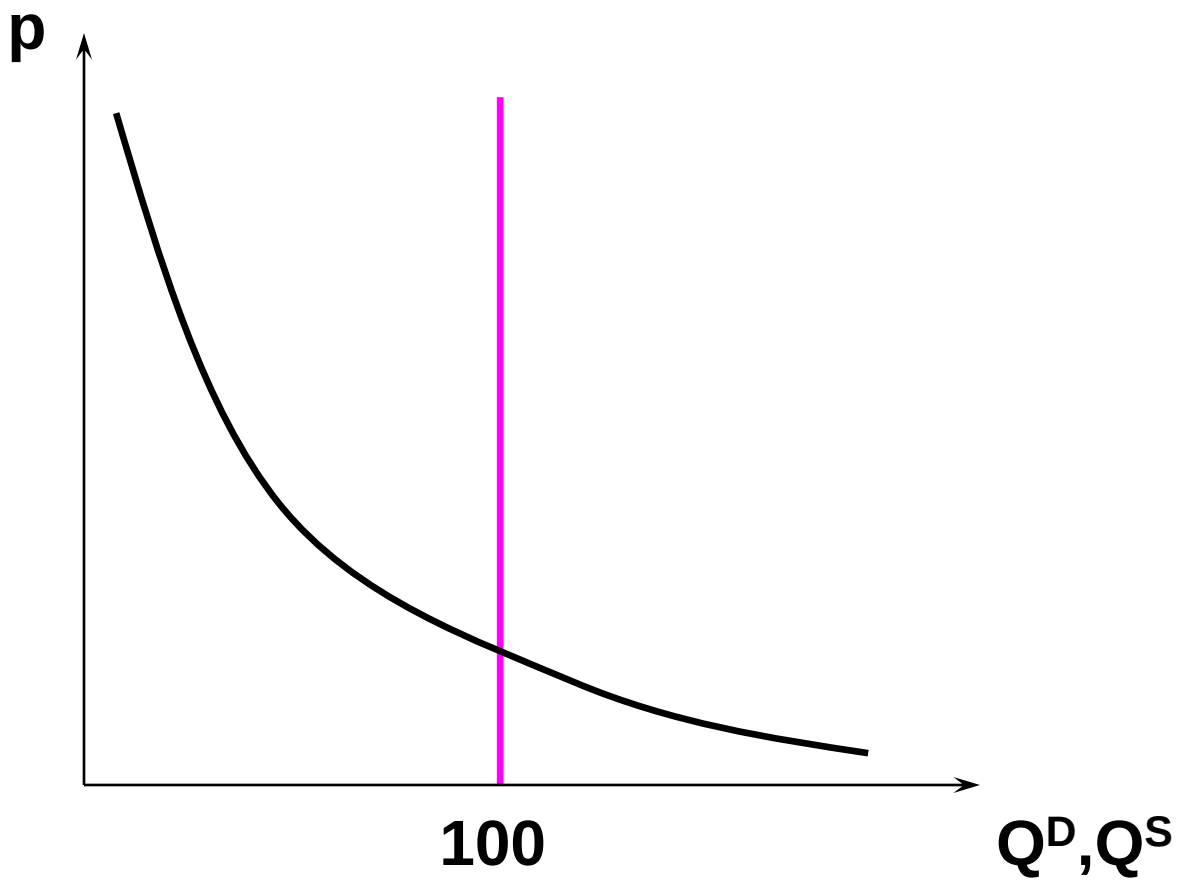
Competitive Market Equilibrium

- **“low” rental price ⇒ quantity demanded of close apartments exceeds quantity available ⇒ price will rise.**
- **“high” rental price ⇒ quantity demanded less than quantity available ⇒ price will fall.**

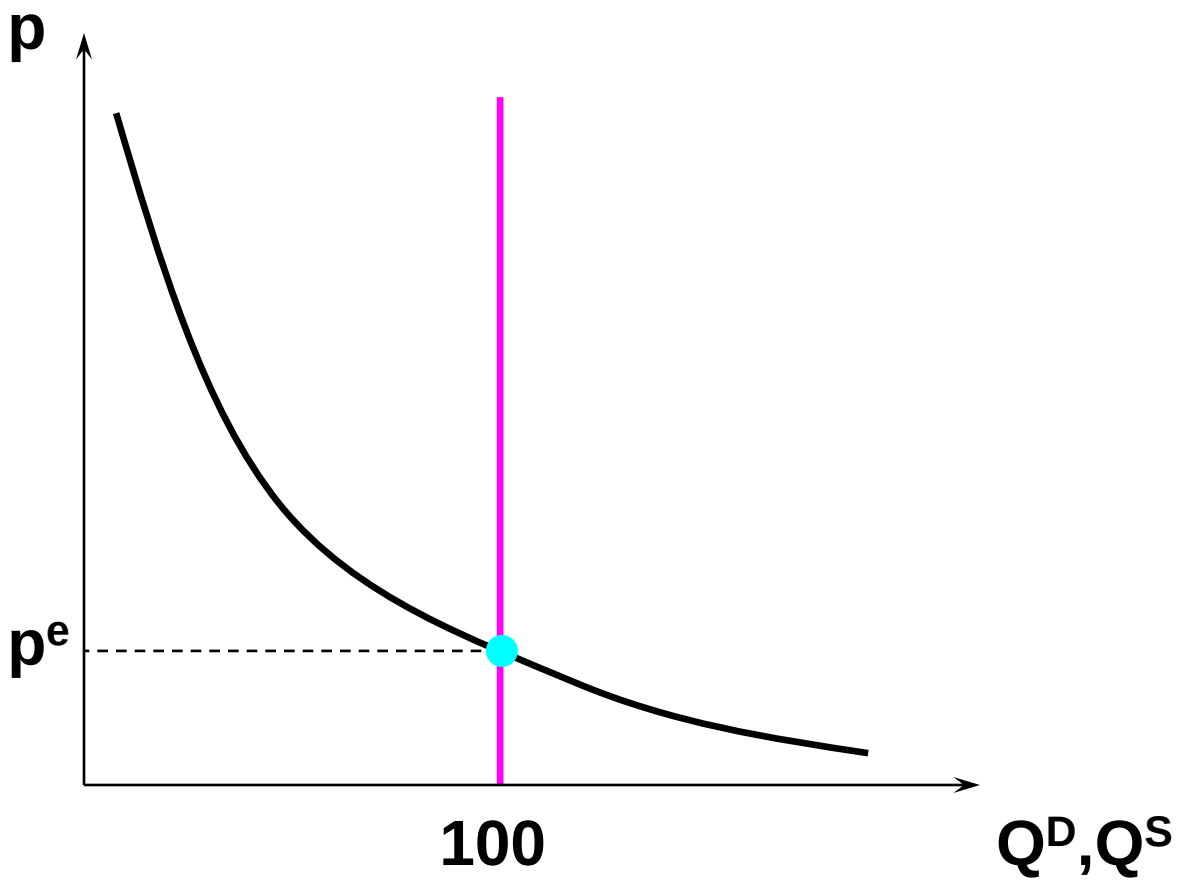
Competitive Market Equilibrium

- **Quantity demanded = quantity available**
  $\Rightarrow$ price will neither rise nor fall
- **so the market is at a competitive equilibrium.**

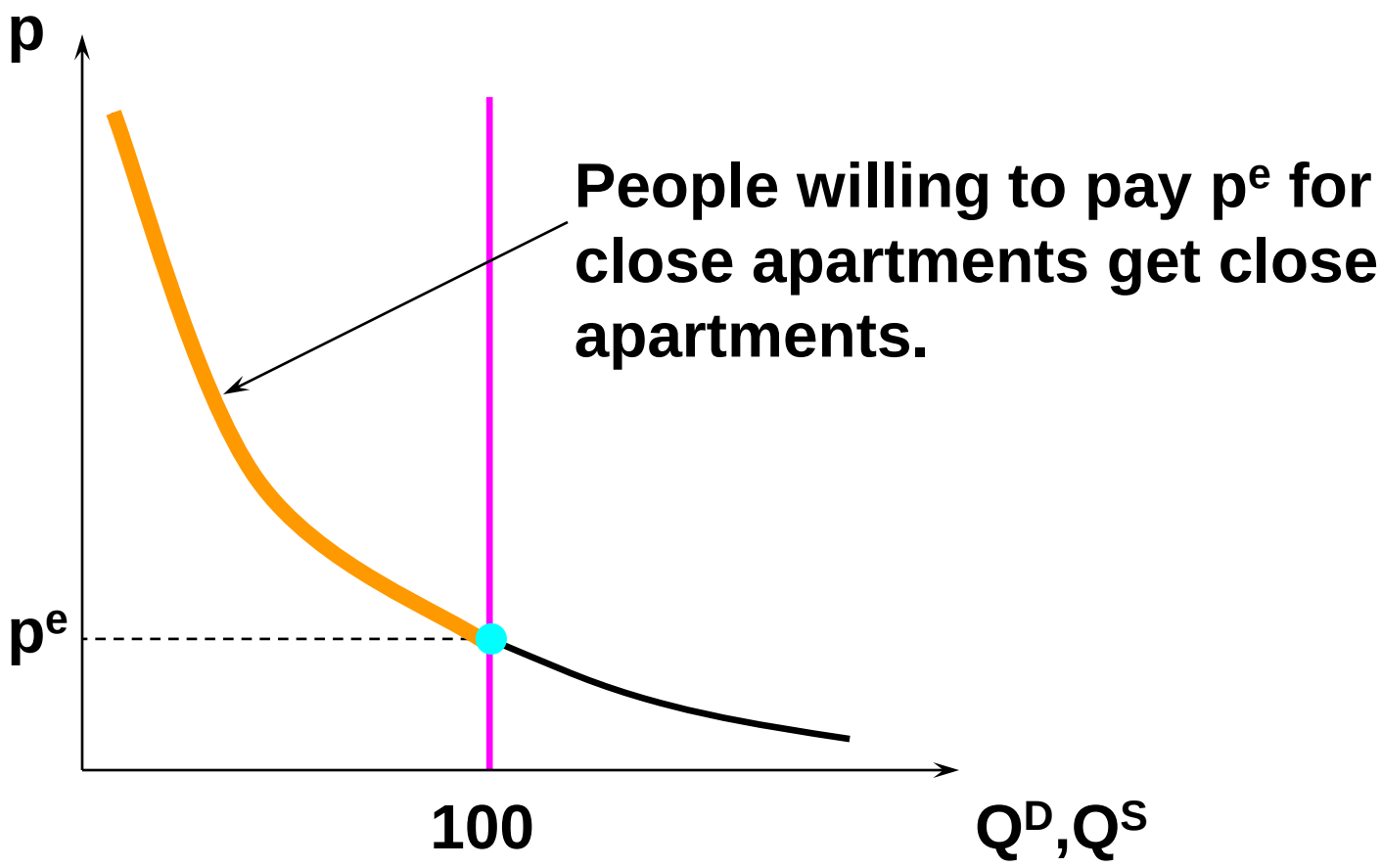
Competitive Market Equilibrium



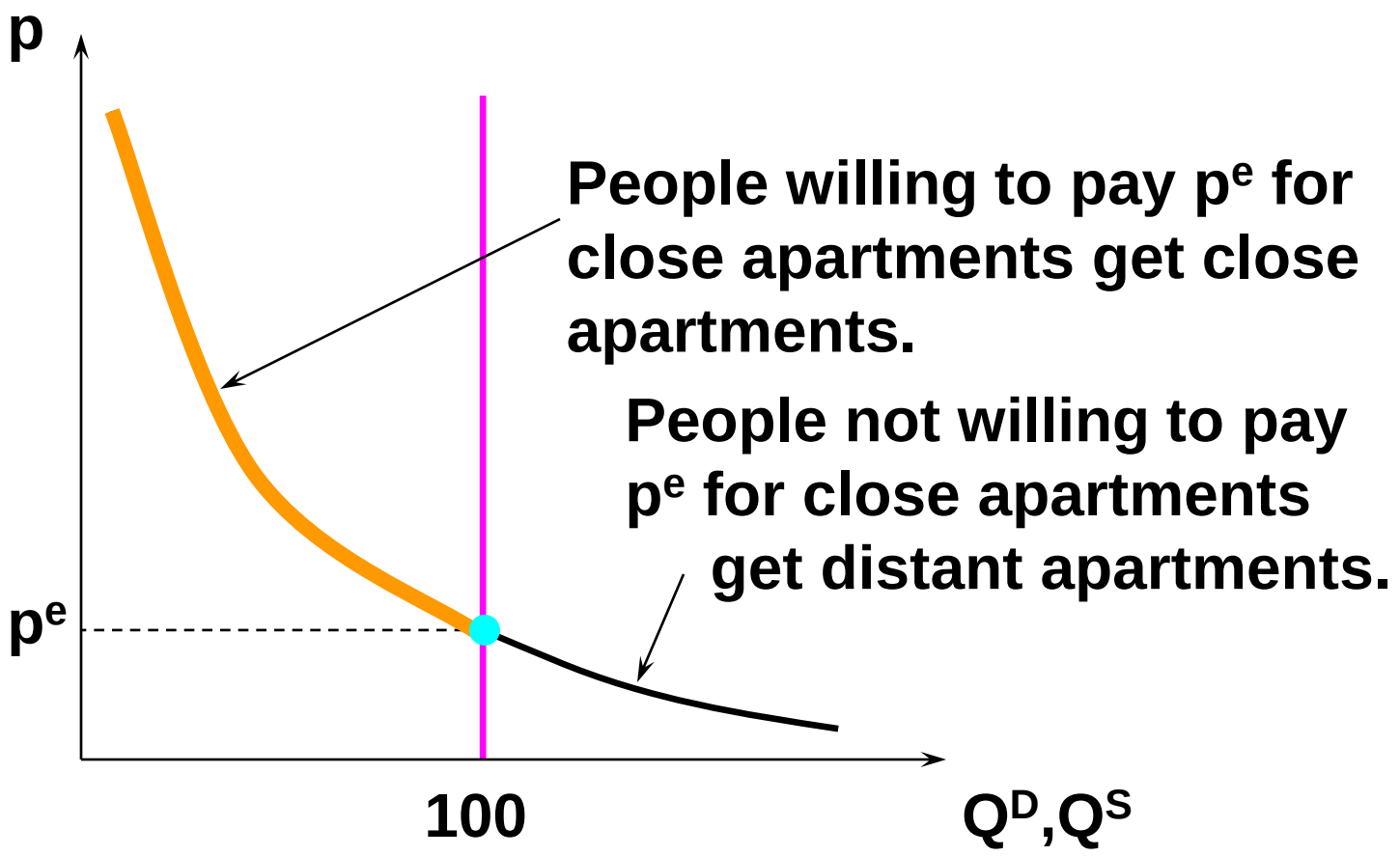
Competitive Market Equilibrium



Competitive Market Equilibrium



Competitive Market Equilibrium



Competitive Market Equilibrium

- **Q: Who rents the close apartments?**
- **A: Those most willing to pay.**
- **Q: Who rents the distant apartments?**
- **A: Those least willing to pay.**
- **So the competitive market allocation is by “willingness-to-pay”.**

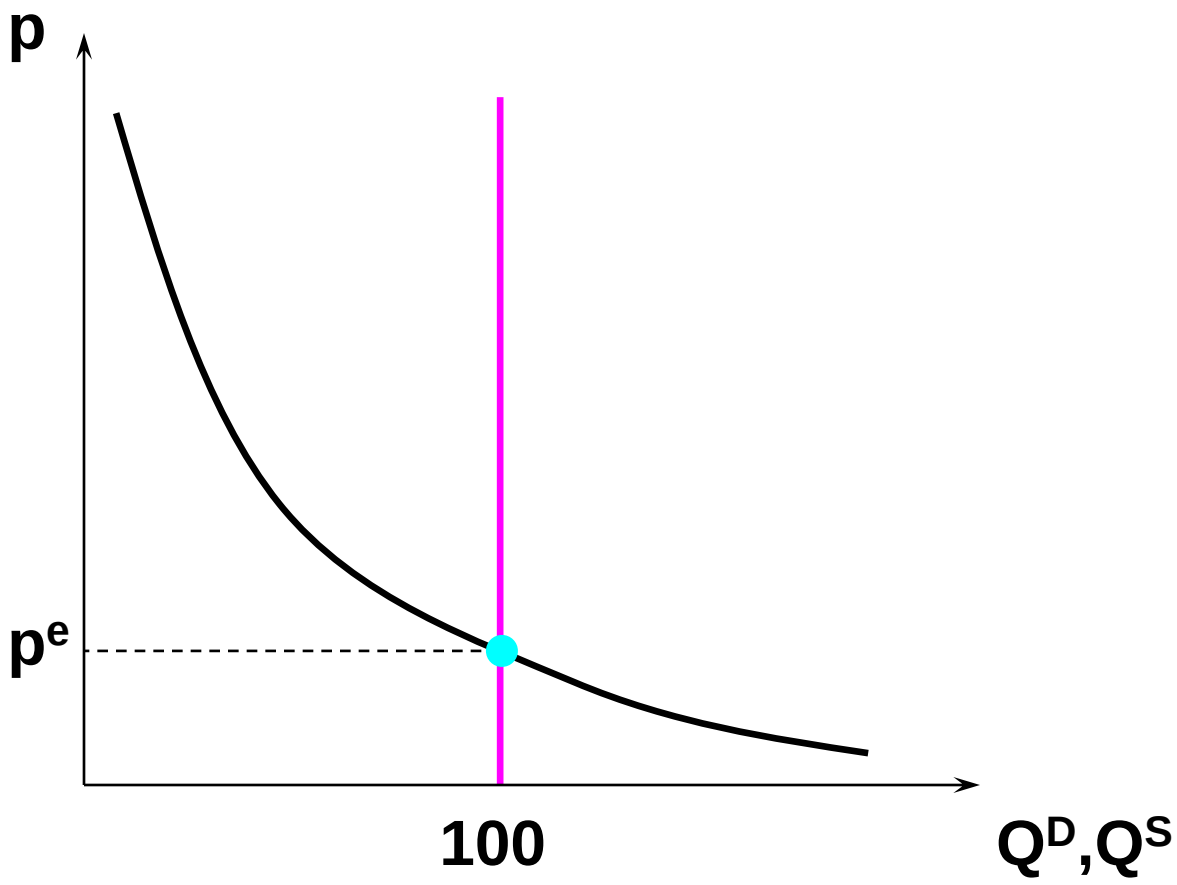
Comparative Statics

- **What is exogenous in the model?**
  - **price of distant apartments**
  - **quantity of close apartments**
  - **incomes of potential renters.**
- **What happens if these exogenous variables change?**

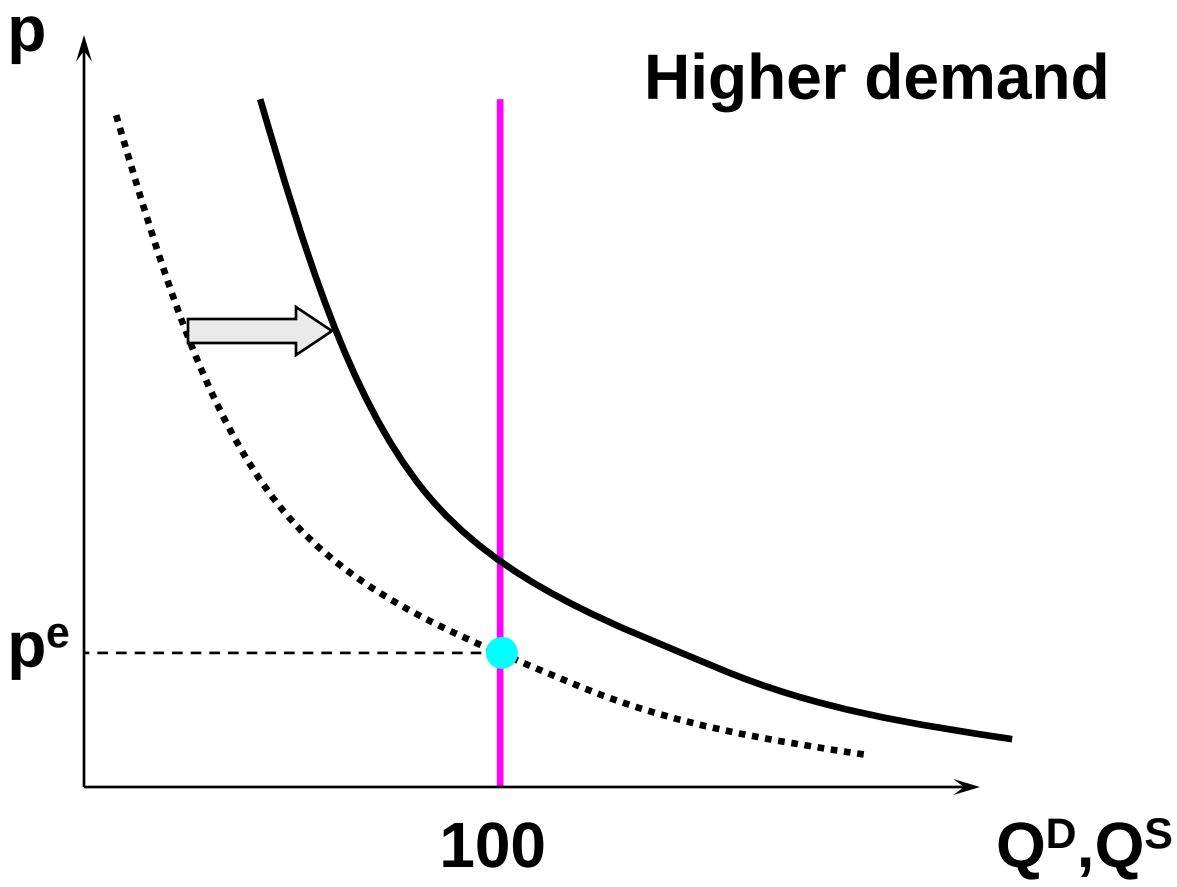
Comparative Statics

- **Suppose the price of distant apartment rises.**
- **Demand for close apartments increases (rightward shift), causing**
- **a higher price for close apartments.**

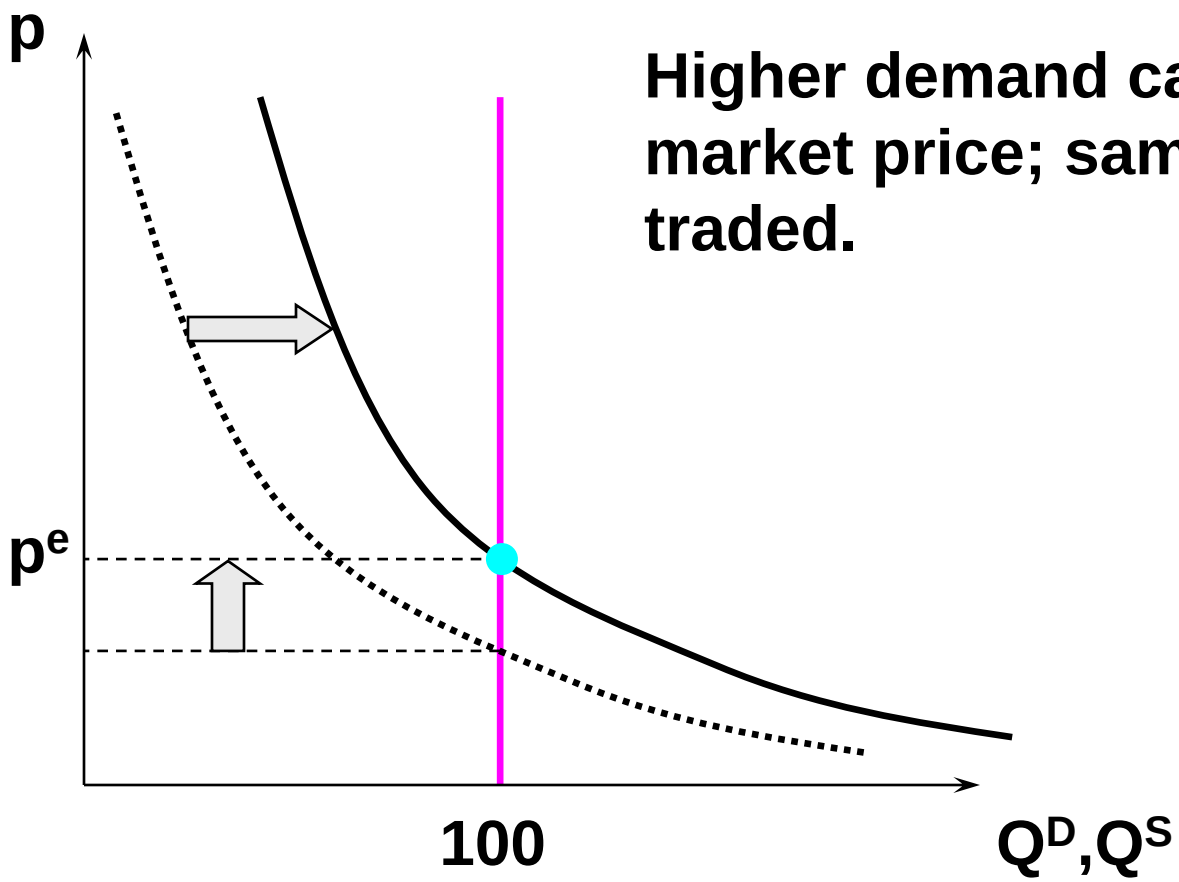
Market Equilibrium



Market Equilibrium



Market Equilibrium

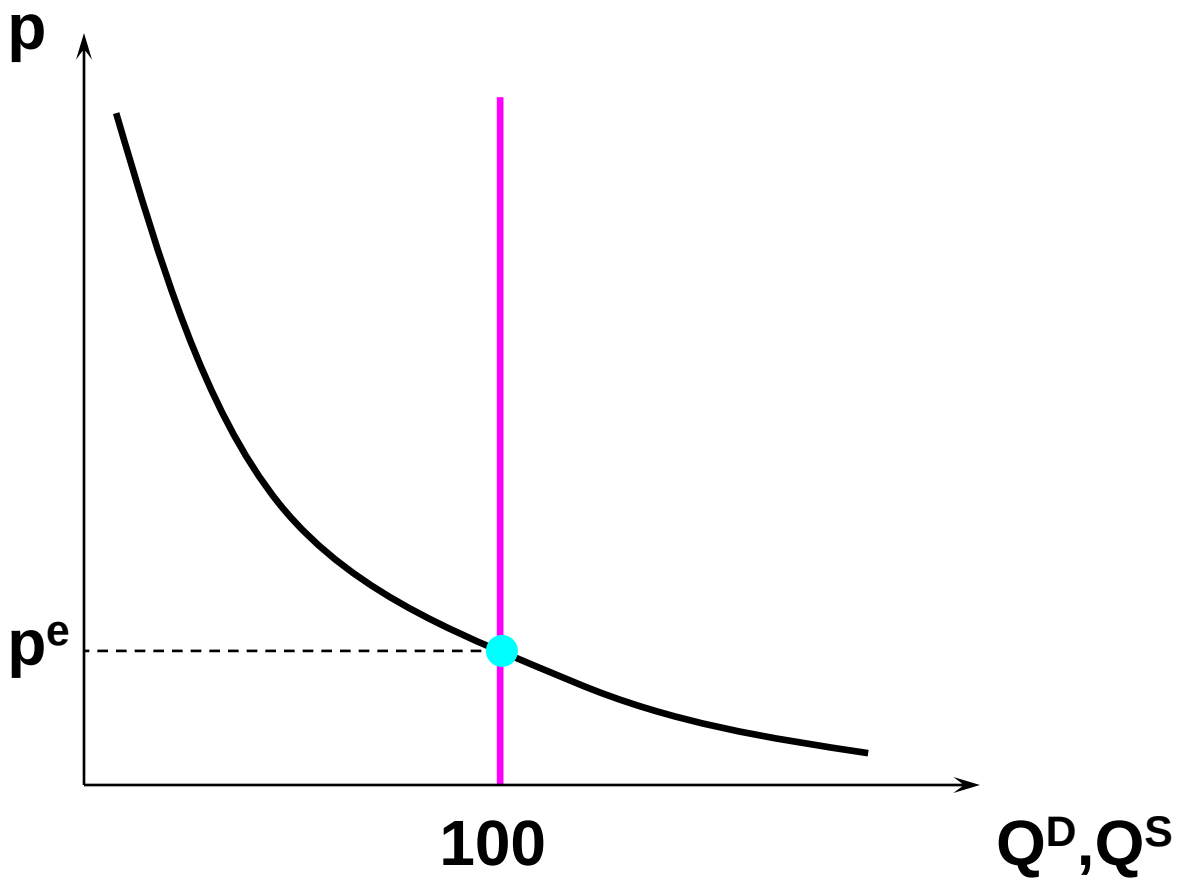


Higher demand causes higher market price; same quantity traded.

Comparative Statics

- **Suppose there were more close apartments.**
- **Supply is greater, so**
- **the price for close apartments falls.**

Market Equilibrium



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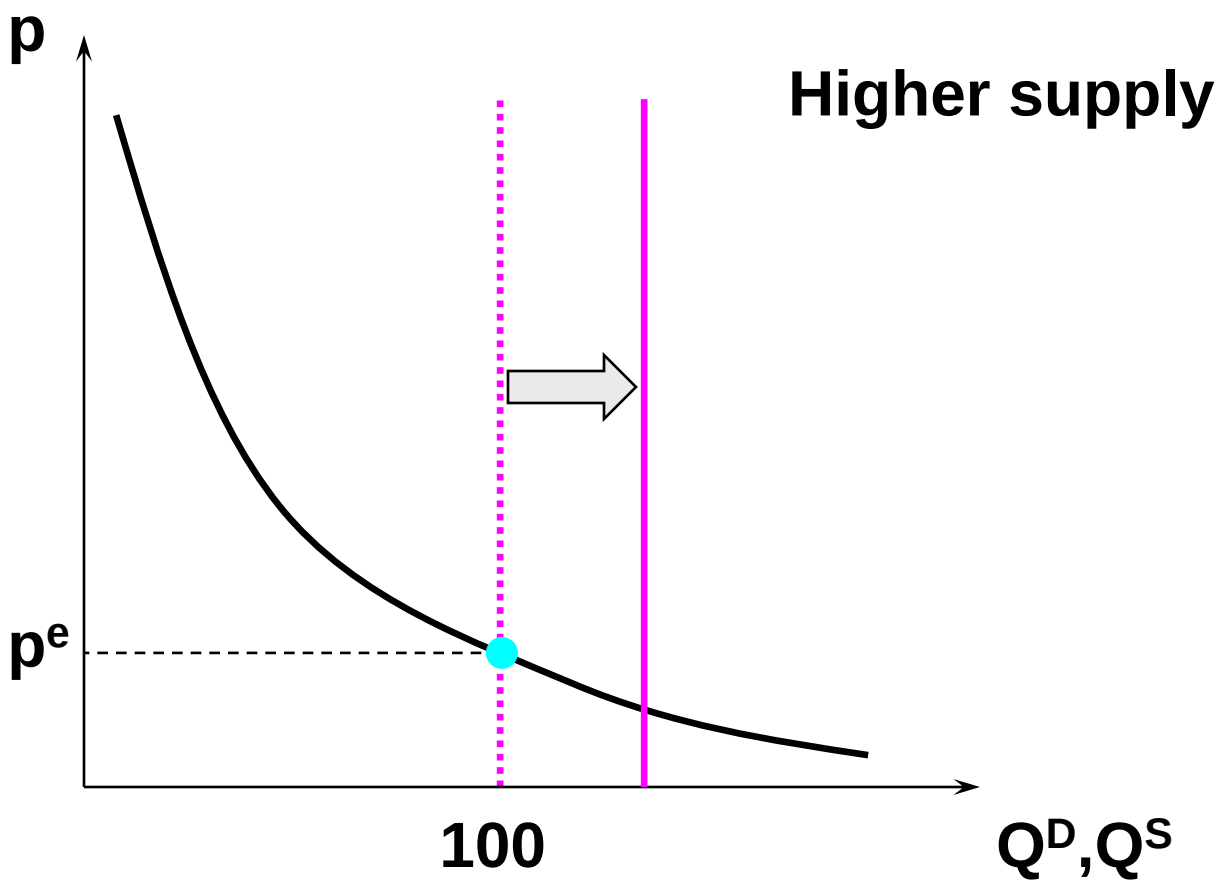
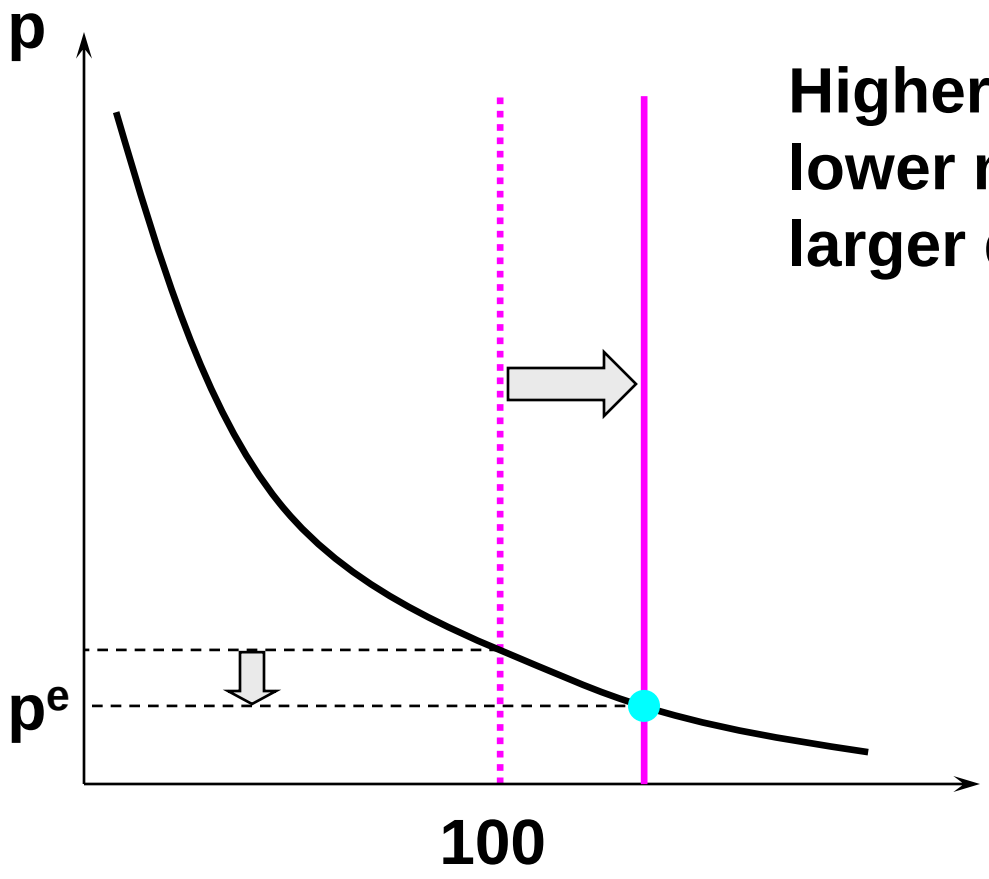


Market Equilibrium

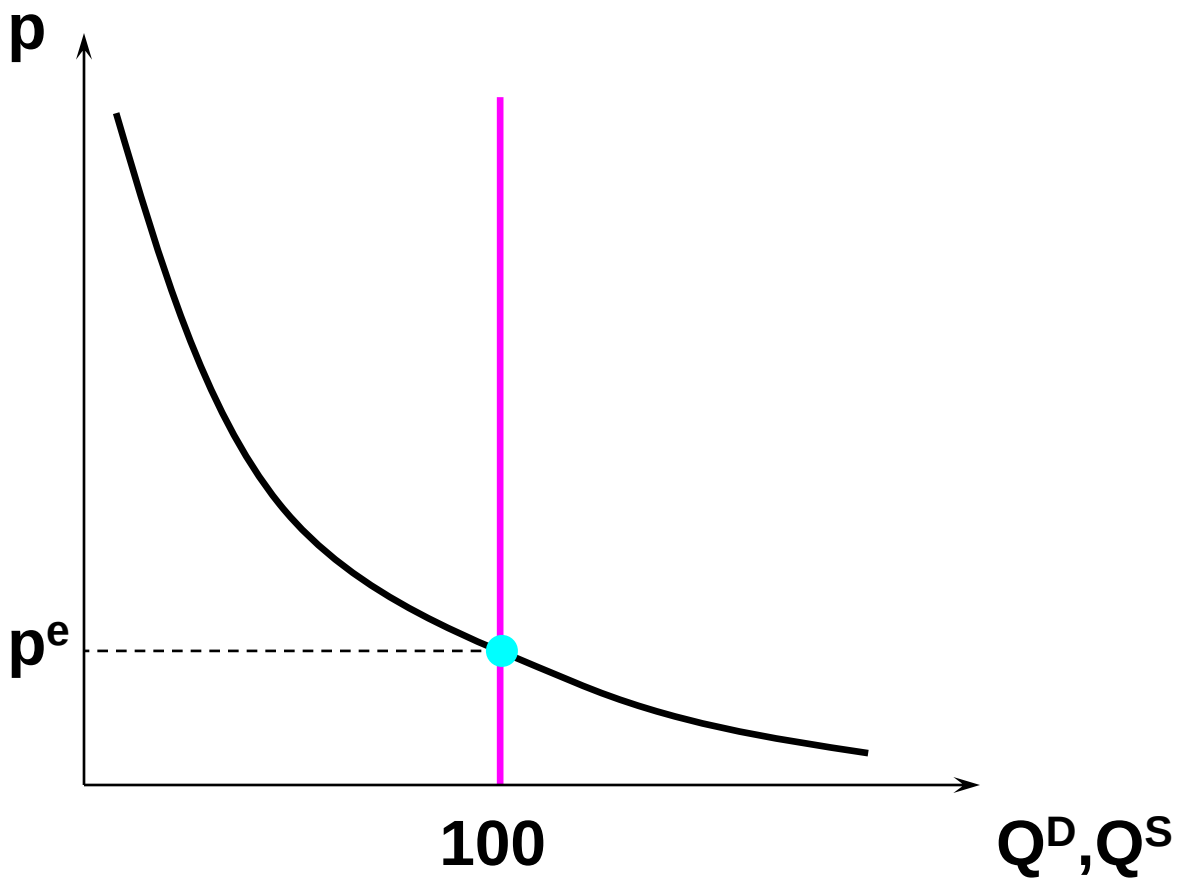


Higher supply causes a lower market price and a larger quantity traded.

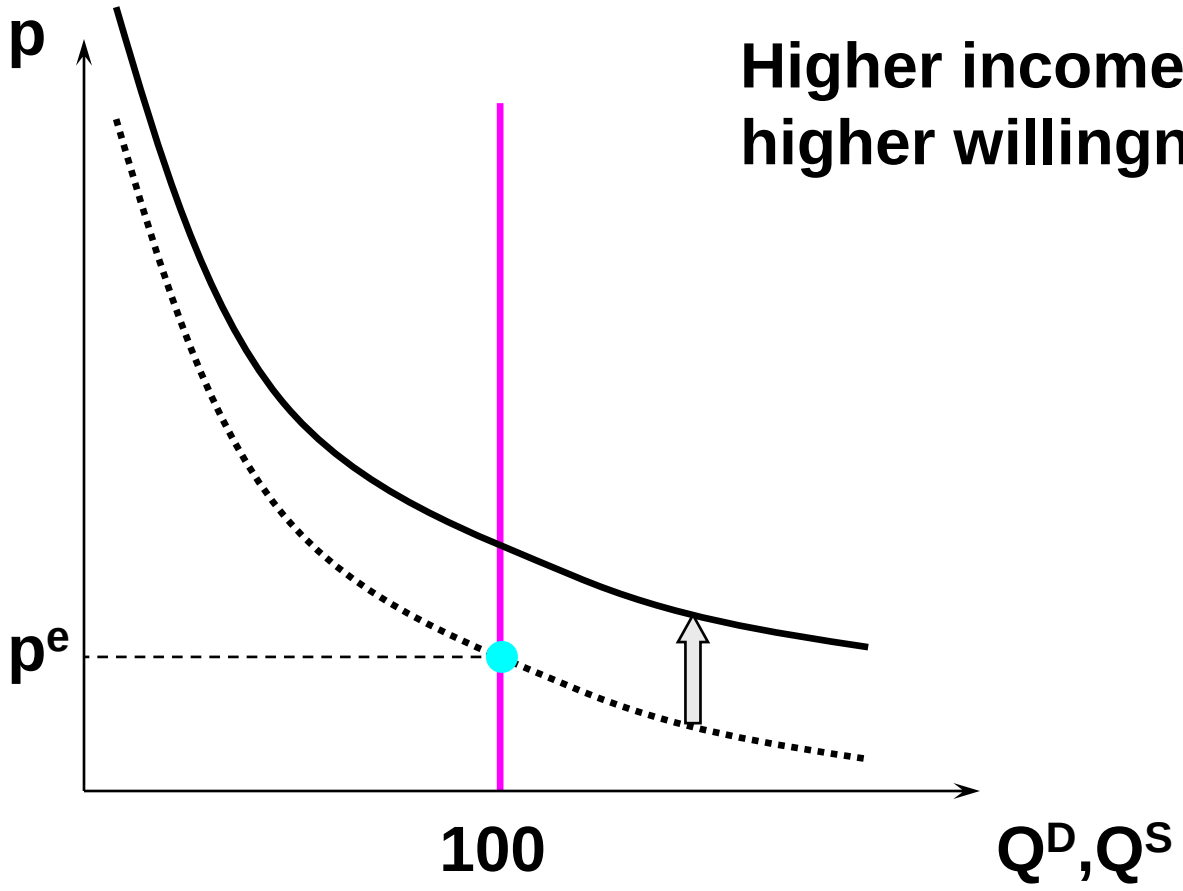
Comparative Statics

- **Suppose potential renters' incomes rise, increasing their willingness-to-pay for close apartments.**
- **Demand rises (upward shift), causing**
- **higher price for close apartments.**

Market Equilibrium

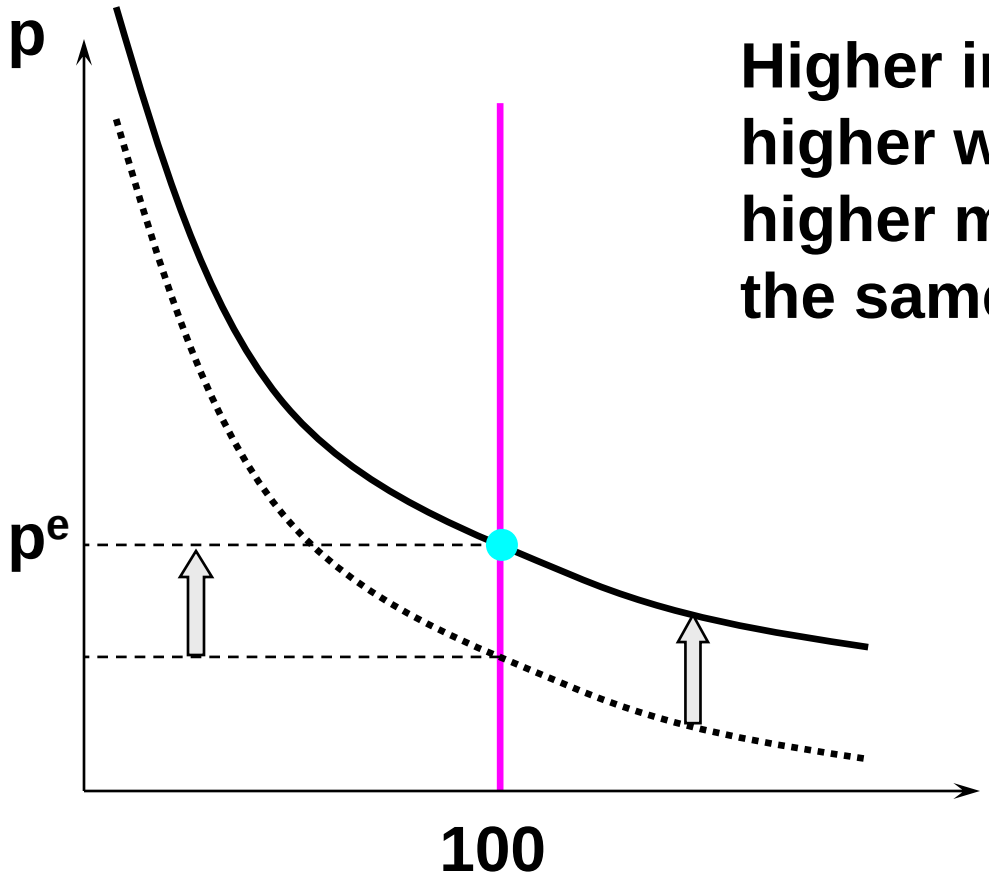


Market Equilibrium



Higher incomes cause higher willingness-to-pay

Market Equilibrium



Higher incomes cause higher willingness-to-pay, higher market price, and the same quantity traded.

Taxation Policy Analysis

- **Local government taxes apartment owners.**
- **What happens to**
  - **price**
  - **quantity of close apartments rented?**
- **Is any of the tax “passed” to renters?**

Taxation Policy Analysis

- **Market supply is unaffected.**
- **Market demand is unaffected.**
- **So the competitive market equilibrium is unaffected by the tax.**
- **Price and the quantity of close apartments rented are not changed.**
- **Landlords pay all of the tax.**

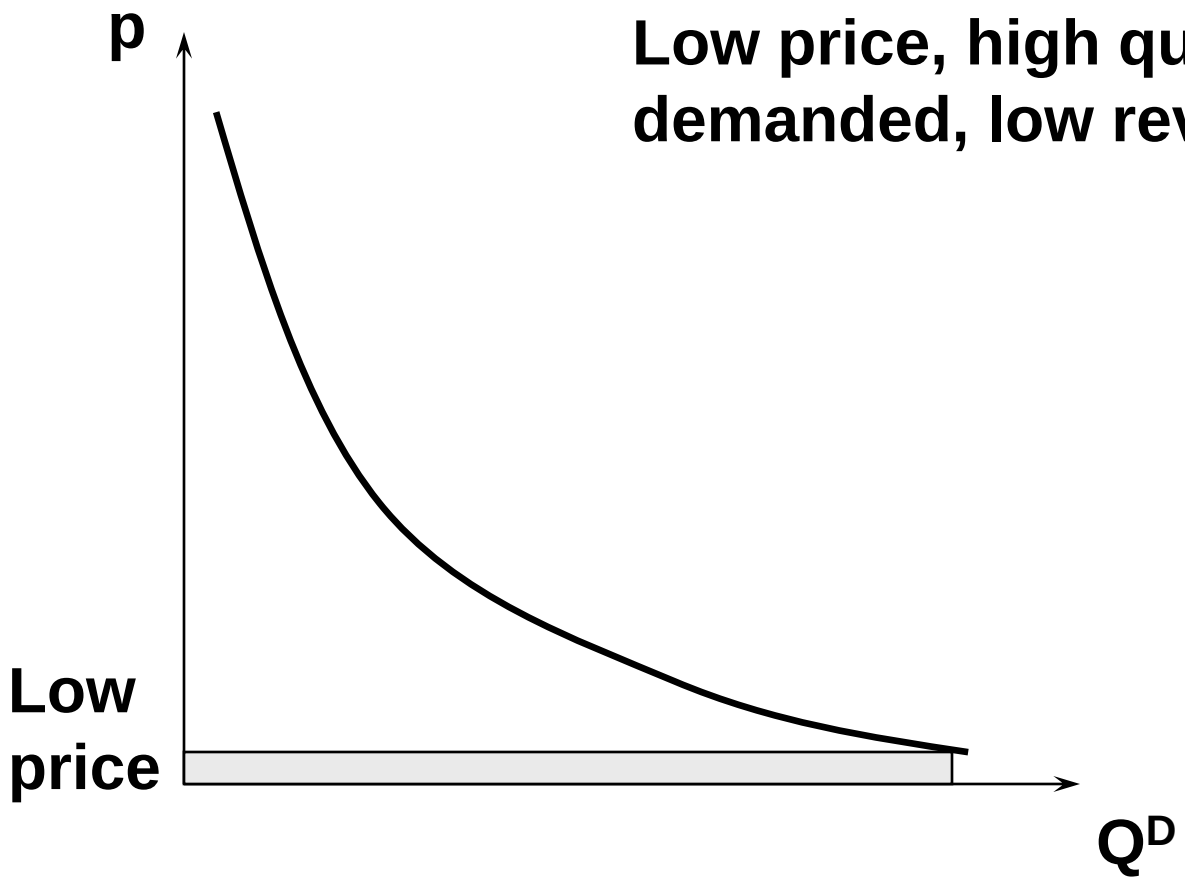
Imperfectly Competitive Markets

- **Amongst many possibilities are:**
  - **a monopolistic landlord**
  - **a perfectly discriminatory monopolistic landlord**
  - **a competitive market subject to rent control.**

A Monopolistic Landlord

- **When the landlord sets a rental price p he rents D(p) apartments.**
- **Revenue = pD(p).**
- **Revenue is low if $p \approx 0$**
- **Revenue is low if p is so high that $D(p) \approx 0$.**
- **An intermediate value for p maximizes revenue.**

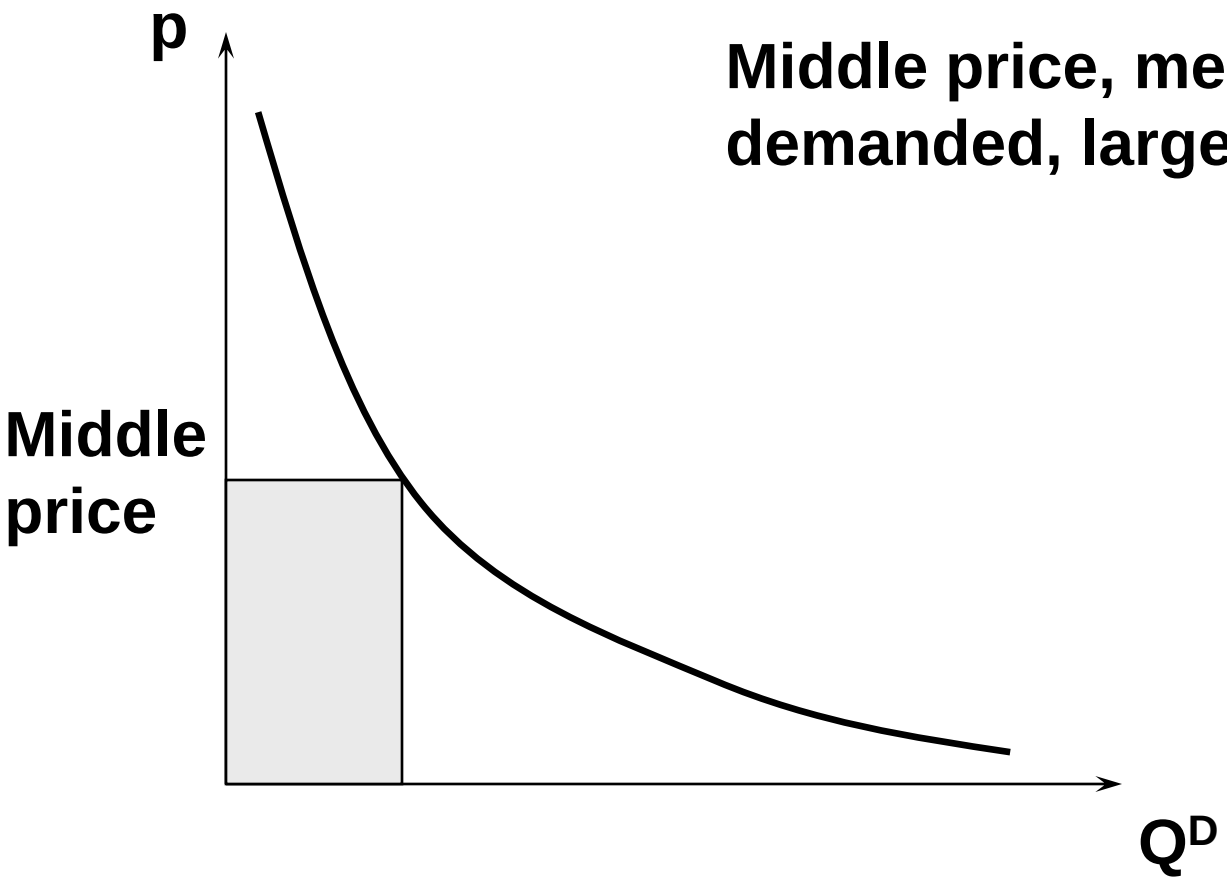
Monopolistic Market Equilibrium



Monopolistic Market Equilibrium

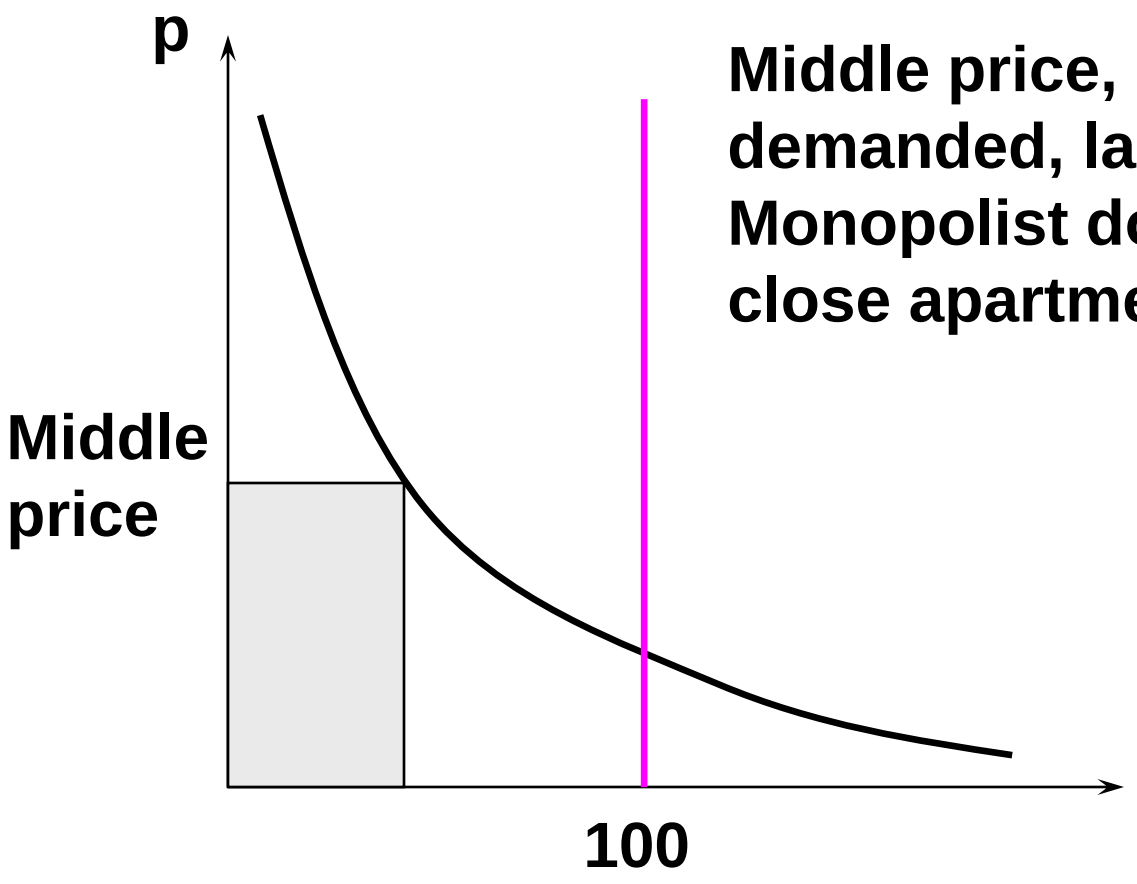
High price, low quantity demanded, low revenue.

Monopolistic Market Equilibrium



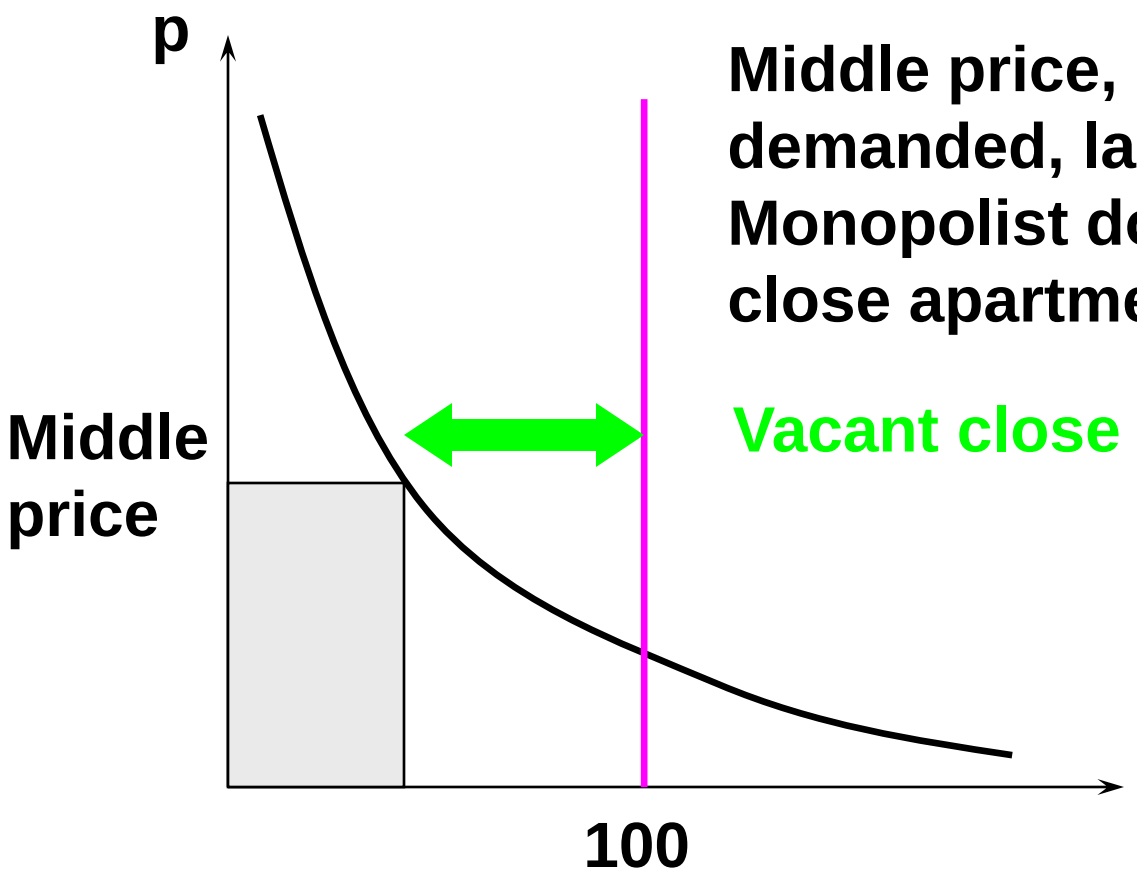
Middle price, medium quantity demanded, larger revenue.

Monopolistic Market Equilibrium



Middle price, medium quantity demanded, larger revenue. Monopolist does not rent all the close apartments.

Monopolistic Market Equilibrium



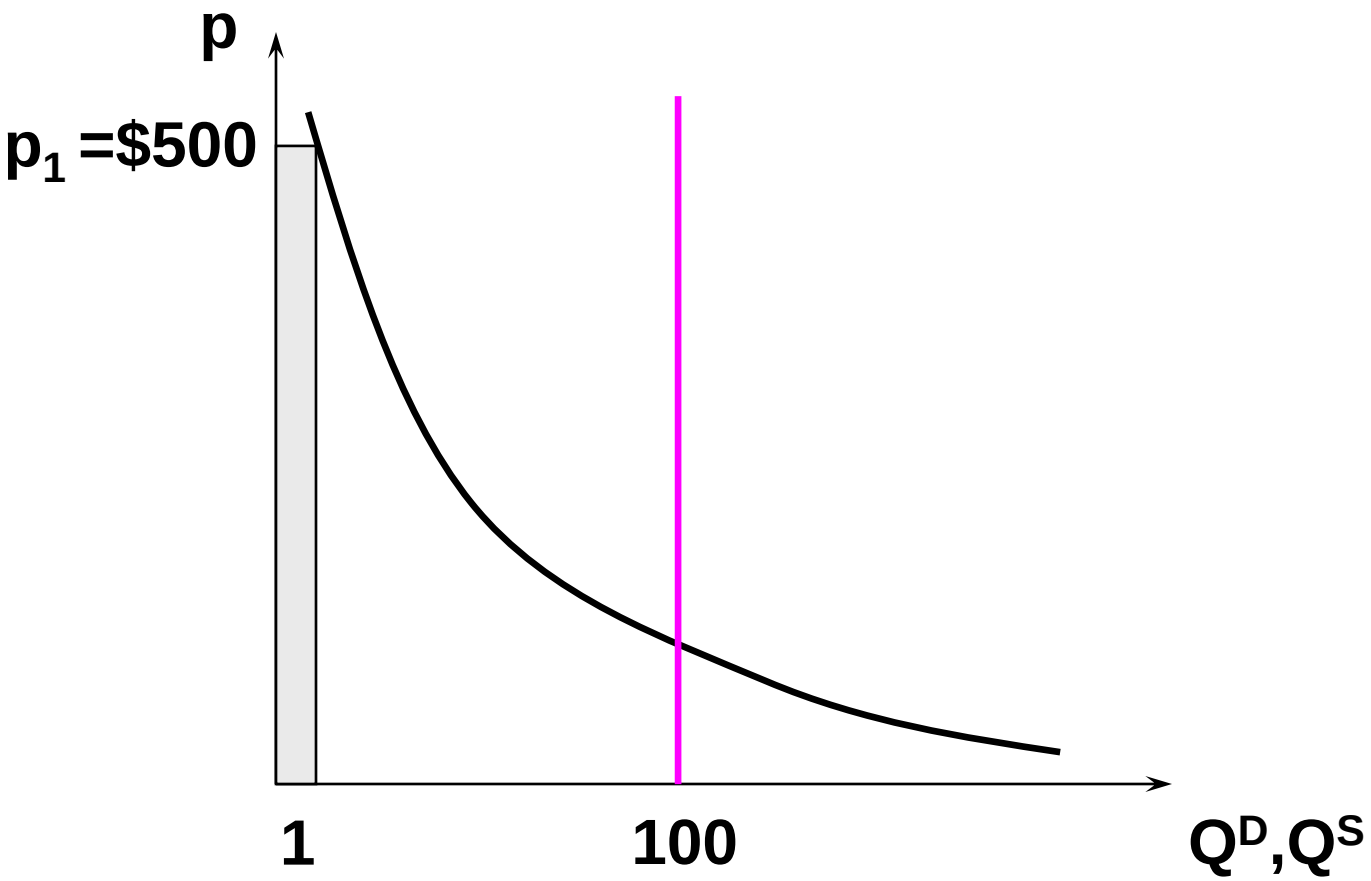
Middle price, medium quantity demanded, larger revenue. Monopolist does not rent all the close apartments.

Vacant close apartments.

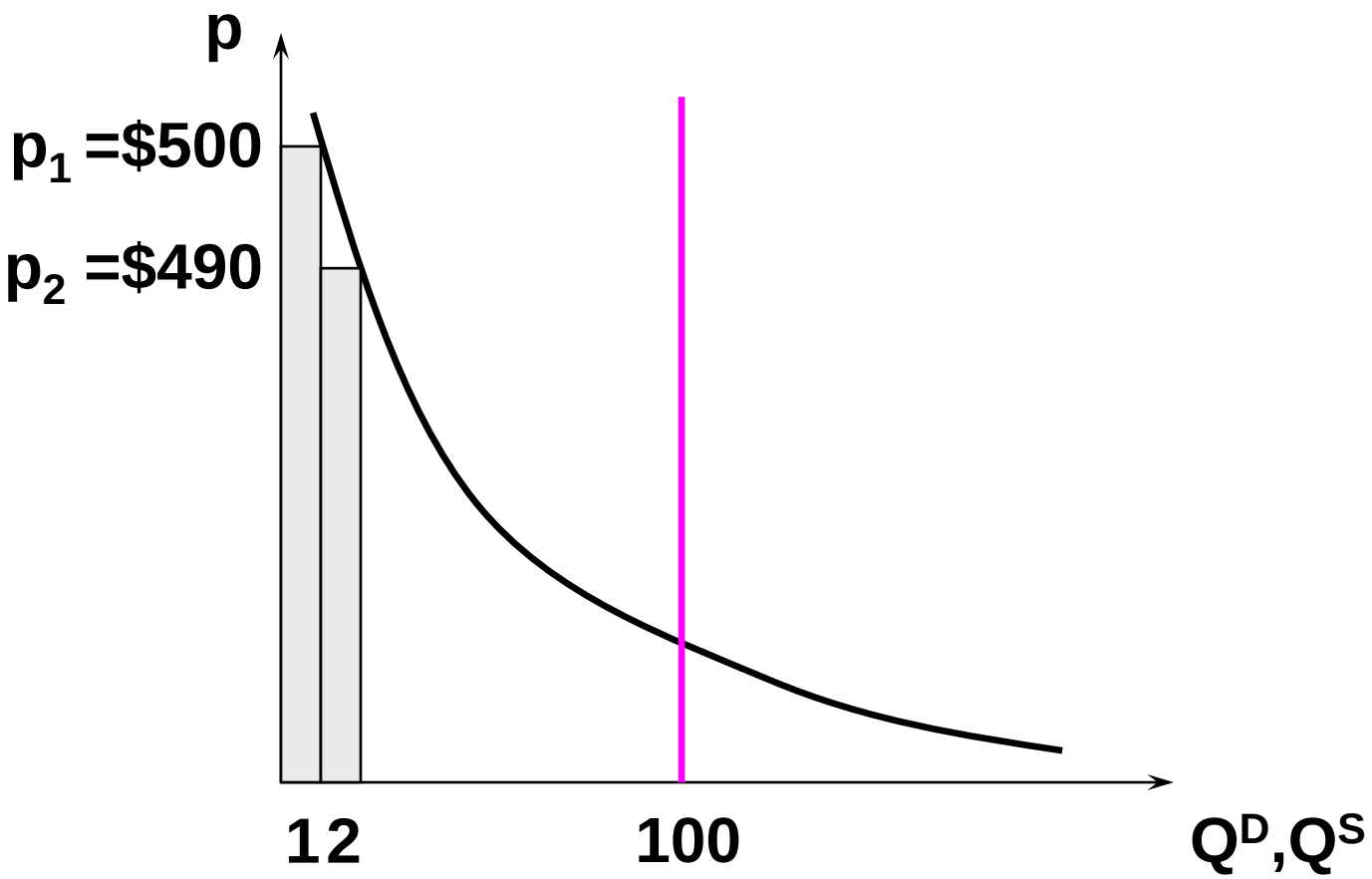
Perfectly Discriminatory Monopolistic Landlord

- **Imagine the monopolist knew everyone's willingness-to-pay.**
- **Charge $500 to the most willing-to-pay,**
- **charge $490 to the 2nd most willing-to-pay, etc.**

Discriminatory Monopolistic Market Equilibrium



Discriminatory Monopolistic Market Equilibrium



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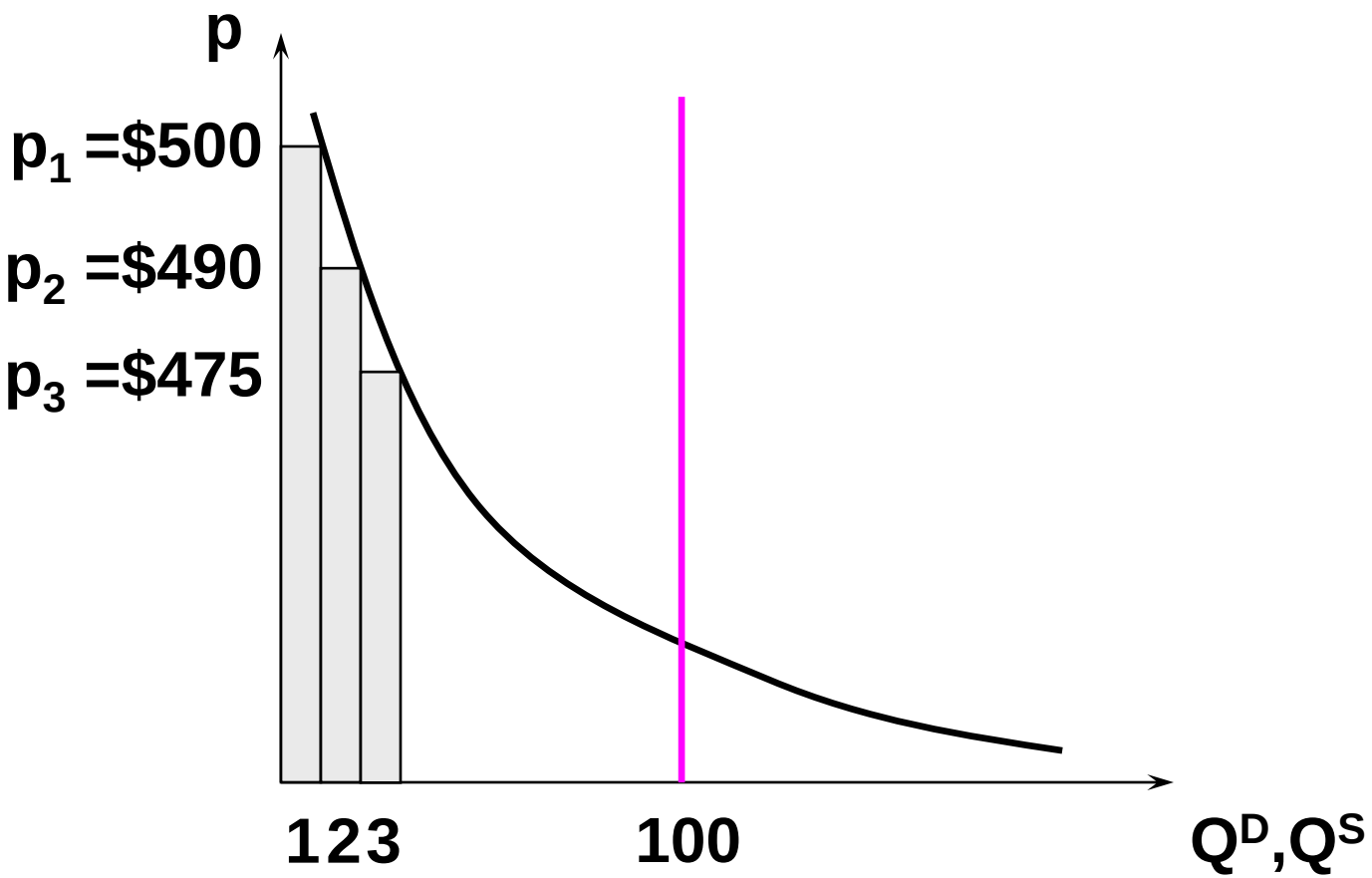

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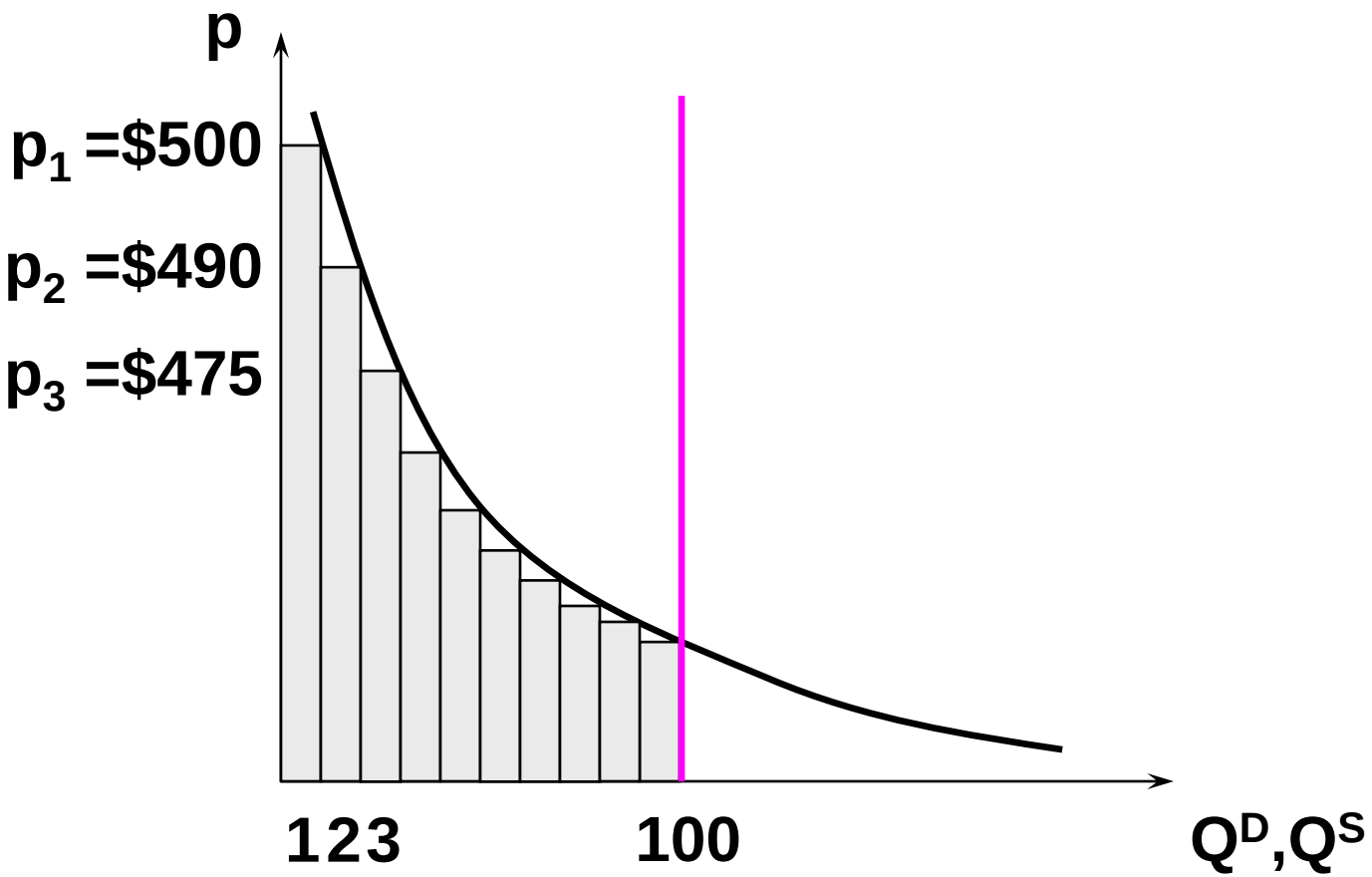
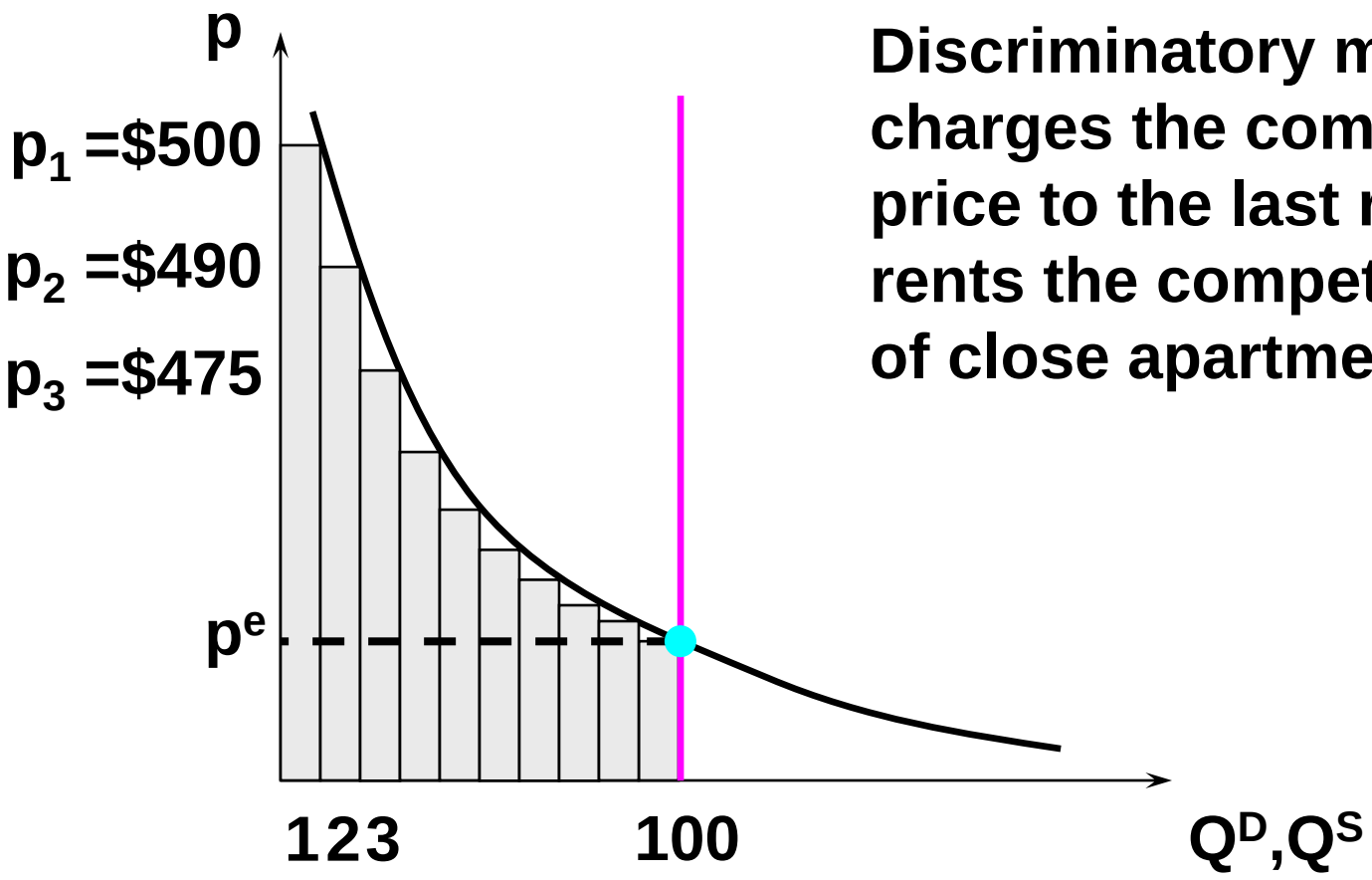


Discriminatory Monopolistic Market Equilibrium

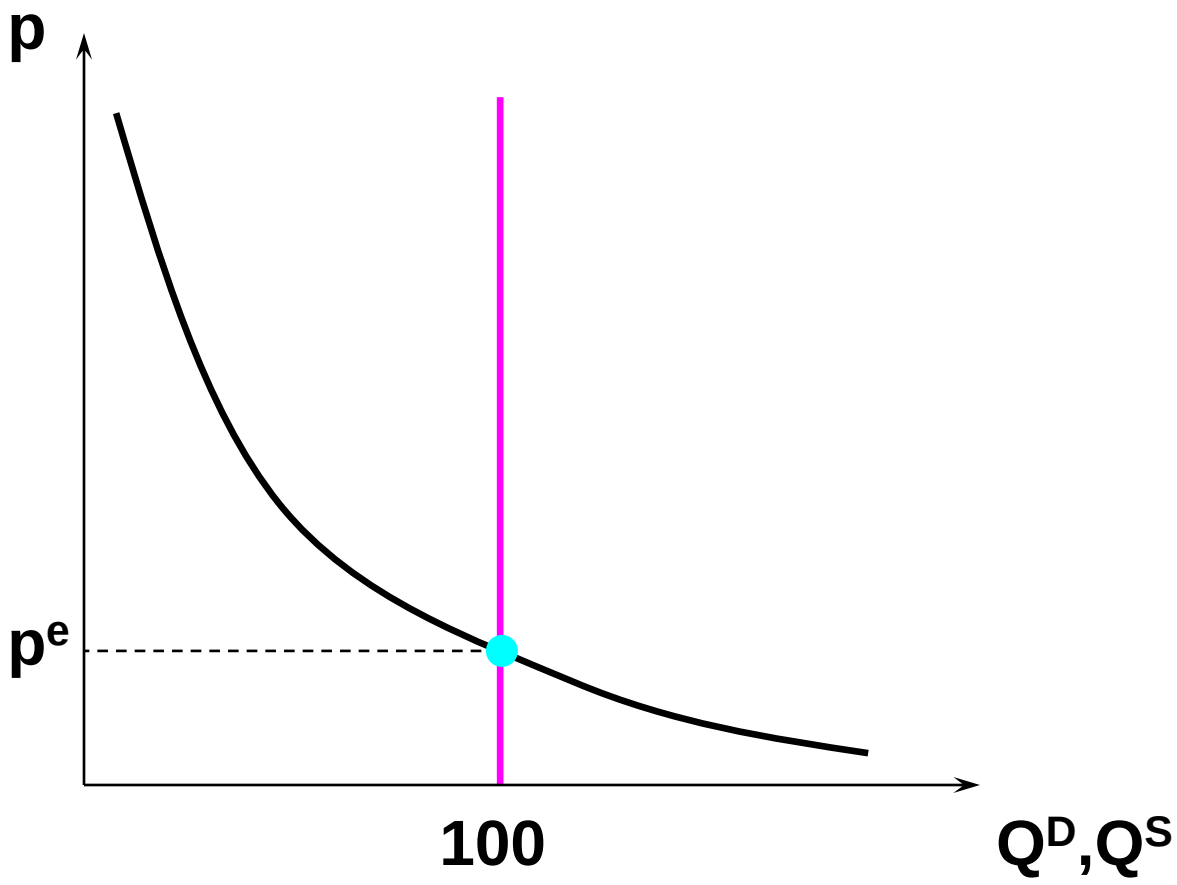


Discriminatory monopolist charges the competitive market price to the last renter, and rents the competitive quantity of close apartments.

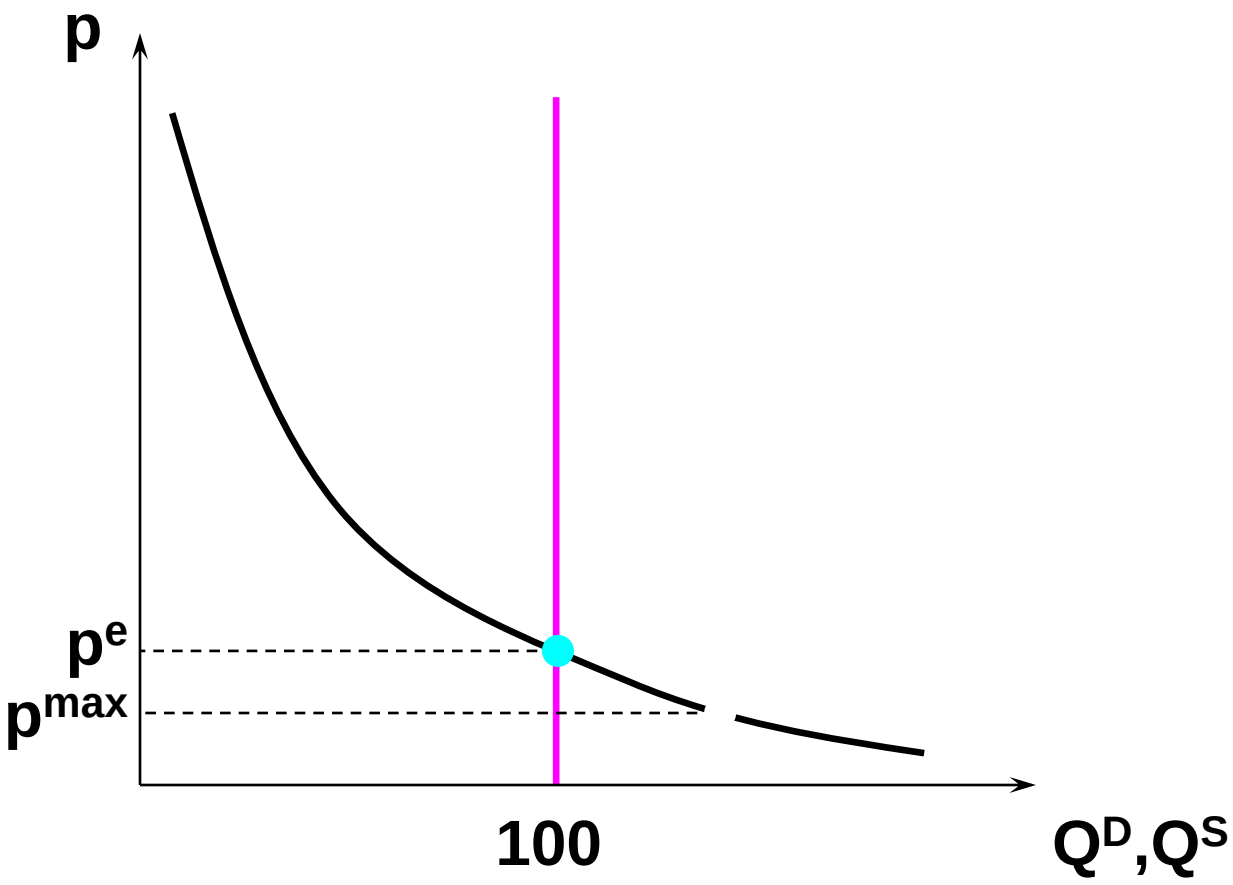
Rent Control

- **Local government imposes a maximum legal price, $p^{max} < p^{e}$, the competitive price.**

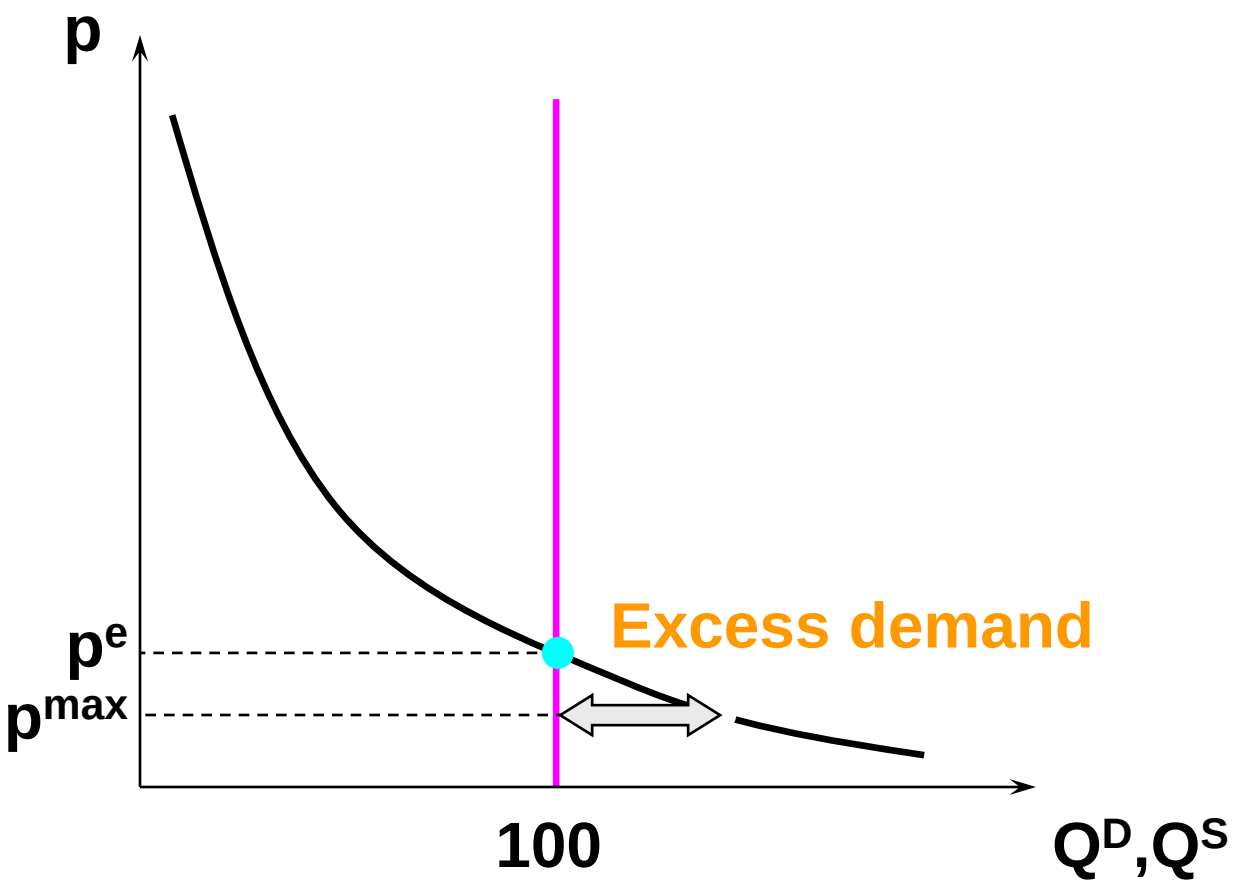
Market Equilibrium



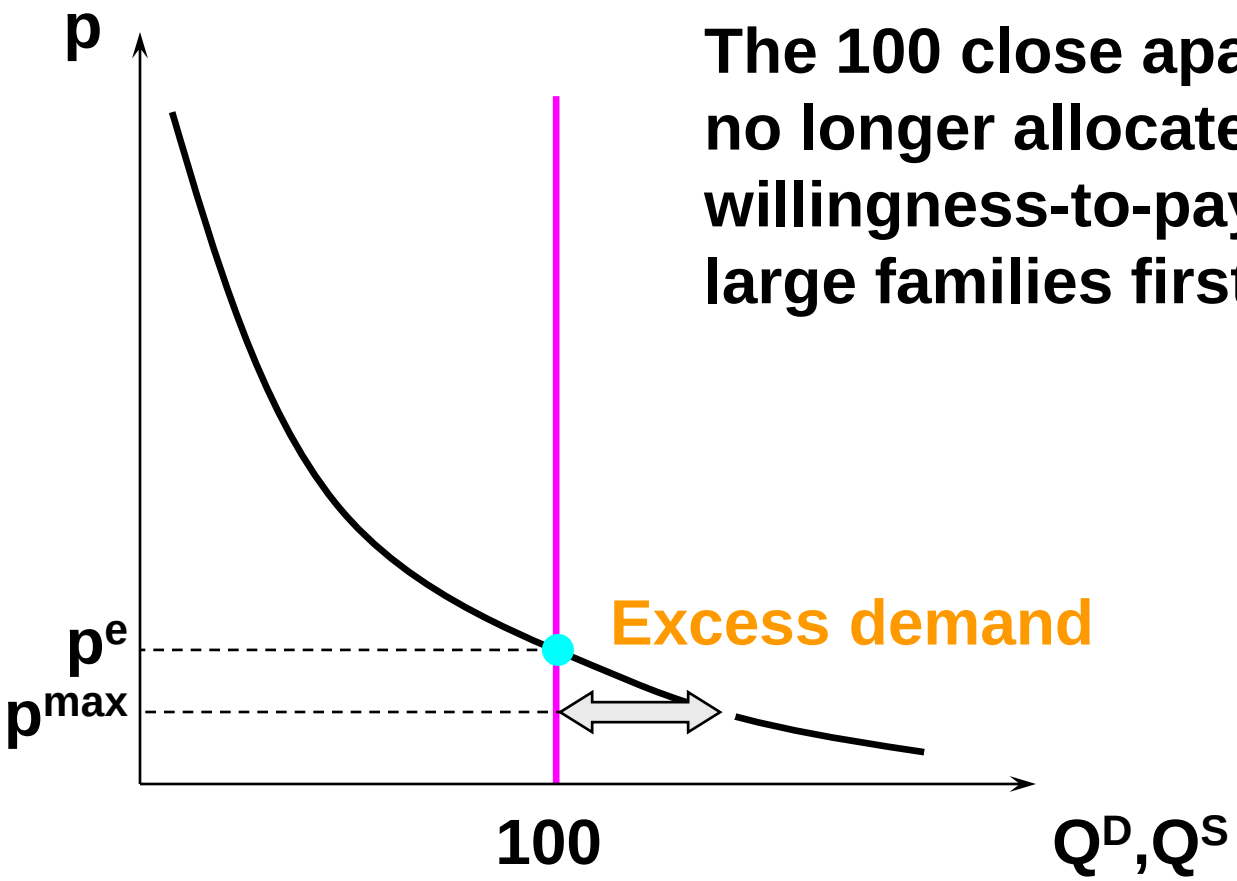
Market Equilibrium



Market Equilibrium



Market Equilibrium



The 100 close apartments are no longer allocated by willingness-to-pay (lottery, lines, large families first?).

Which Market Outcomes Are Desirable?

- **Which is better?**
  - **Rent control**
  - **Perfect competition**
  - **Monopoly**
  - **Discriminatory monopoly**

Pareto Efficiency

- **Vilfredo Pareto; 1848-1923.**
- **A Pareto outcome allows no "wasted welfare";**
- **i.e. the only way one person's welfare can be improved is to lower another person's welfare.**

Pareto Efficiency

- **Jill has an apartment; Jack does not.**
- **Jill values the apartment at $200; Jack would pay $400 for it.**
- **Jill could sublet the apartment to Jack for $300.**
- **Both gain, so it was Pareto inefficient for Jill to have the apartment.**

Pareto Efficiency

- **A Pareto inefficient outcome means there remain unrealized mutual gains-to-trade.**
- **Any market outcome that achieves all possible gains-to-trade must be Pareto efficient.**

Pareto Efficiency

- **Competitive equilibrium:**
  - **all close apartment renters value them at the market price p^e or more**
  - **all others value close apartments at less than p^e**
  - **so no mutually beneficial trades remain**
  - **so the outcome is Pareto efficient.**

Pareto Efficiency

- **Discriminatory Monopoly:**
  - **assignment of apartments is the same as with the perfectly competitive market**
  - **so the discriminatory monopoly outcome is also Pareto efficient.**

Pareto Efficiency

- **Monopoly:**
  - **not all apartments are occupied**
  - **so a distant apartment renter could be assigned a close apartment and have higher welfare without lowering anybody else's welfare.**
  - **so the monopoly outcome is Pareto inefficient.**

Pareto Efficiency

- **Rent Control:**
  - **some close apartments are assigned to renters valuing them at below the competitive price p^e**
  - **some renters valuing a close apartment above p^e don't get close apartments**
  - **Pareto inefficient outcome.**

Harder Questions

- **Over time, will**
  - **the supply of close apartments increase?**
  - **rent control decrease the supply of apartments?**
  - **a monopolist supply more apartments than a competitive rental market?**

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