

LECTURE 8
WELFARE ANALYSIS
February 14, 2019

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 - B. Deadweight loss related to the reduced quantity bought and sold
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Economics 2
Spring 2019

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LECTURE 8

Welfare Analysis



February 14, 2019

Announcements

- **Problem Set 2:**
 - Due next Tuesday (February 19th)
 - Problem set work session this afternoon (February 14), 5–7 p.m. in 648 Evans.
- **First Midterm:**
 - Tuesday, February 26th
 - We will give you more information and a sample midterm next Tuesday.

I. OVERVIEW

Thinking More about Market Outcomes

- Do market outcomes have desirable properties?
- What are the consequences of intervening in well-functioning markets?

Welfare Analysis

- An extension of the supply and demand framework:
 - Makes use of the optimization analysis we have been doing.
 - It is a tool that helps us evaluate the desirability of market outcomes.
- It is a tool that we will use over and over:
 - To evaluate the effects of government intervention.
 - To understand market failures.

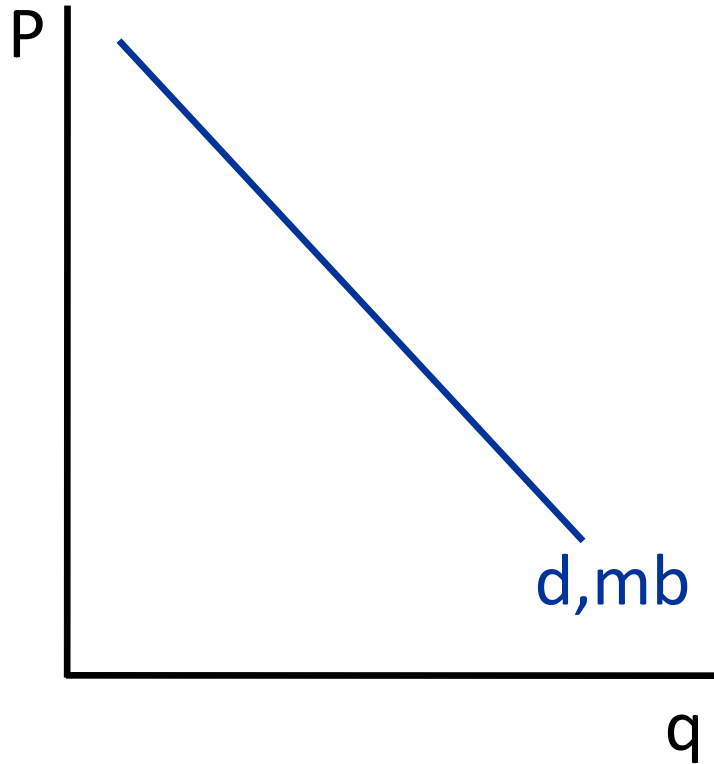
II. CONCEPT OF ECONOMIC SURPLUS

Economic Surplus

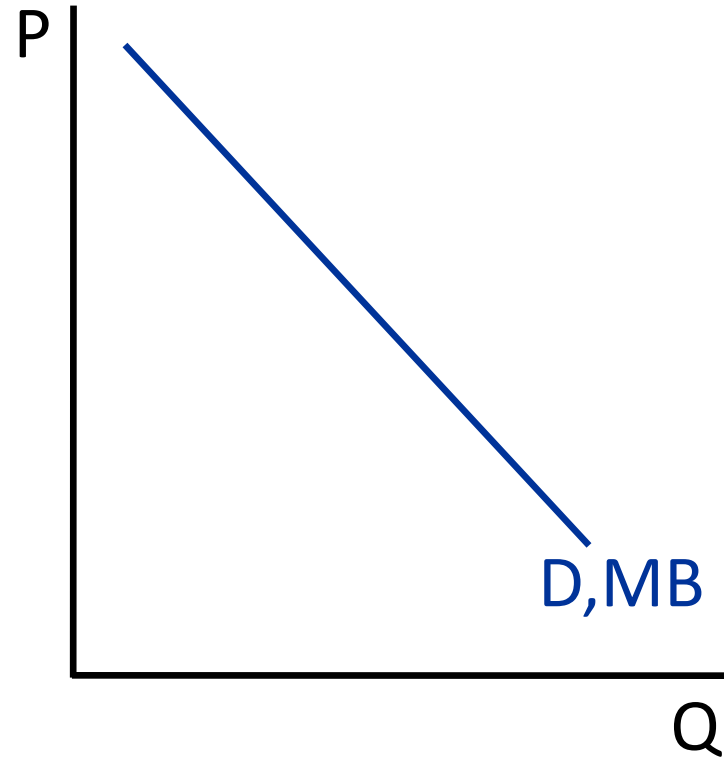
- A measure of the amount by which buyers and sellers benefit from participating in the market.
- The total economic surplus is the sum of:
 - Consumer surplus
 - Producer surplus
 - Government revenue (if relevant)

Demand

Individual Household



Market



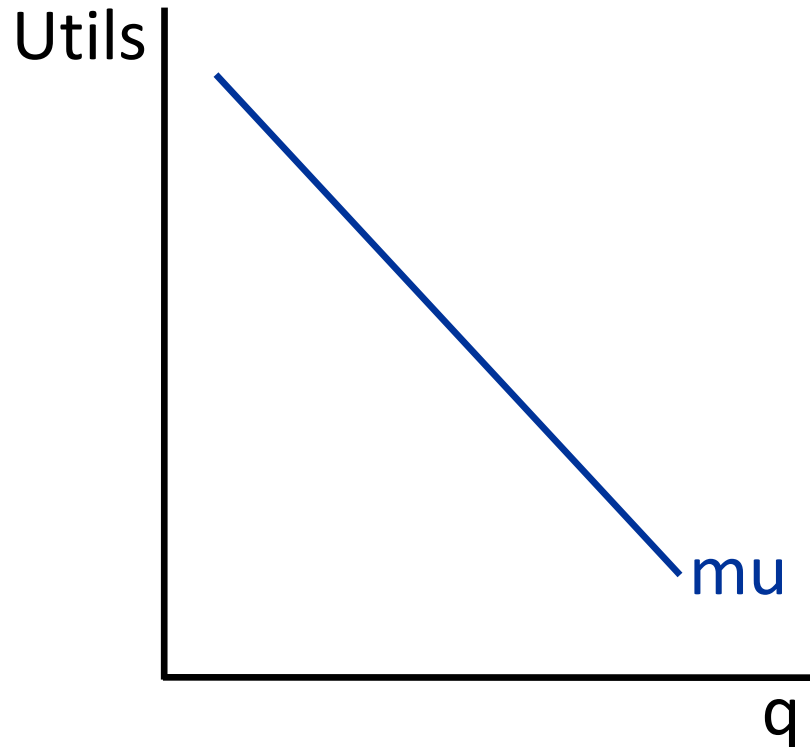
Utility Maximization: $MU_x/P_x = MU_y/P_y$

Marginal Benefit (or Reservation Price)

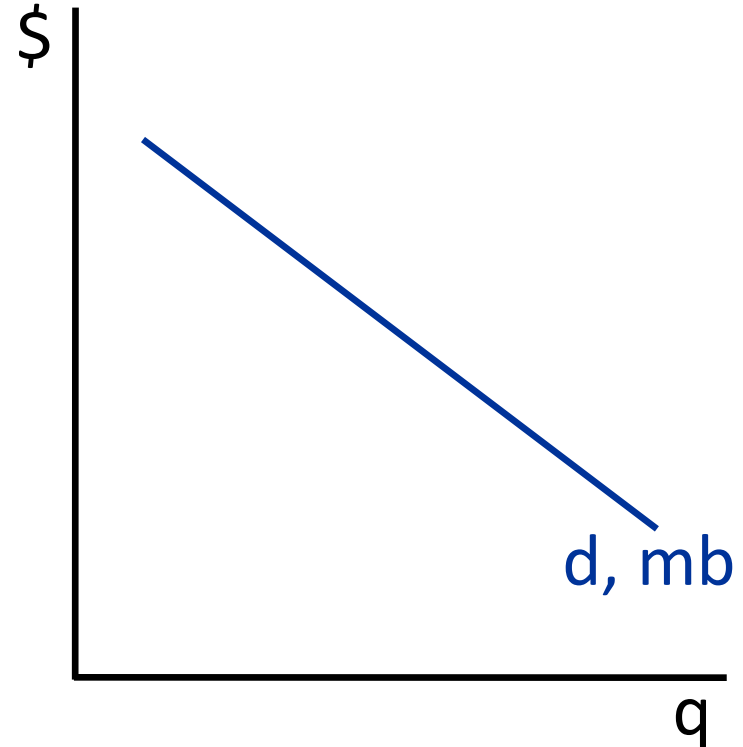
- The dollar value to consumers of another unit of a good.
- What they would be willing to pay for one more unit.
- Comes from utility maximization.
- Depends on the MU of the good, the MU of other goods, the prices of other goods, and income.

Marginal Utility versus Marginal Benefit

Marginal Utility

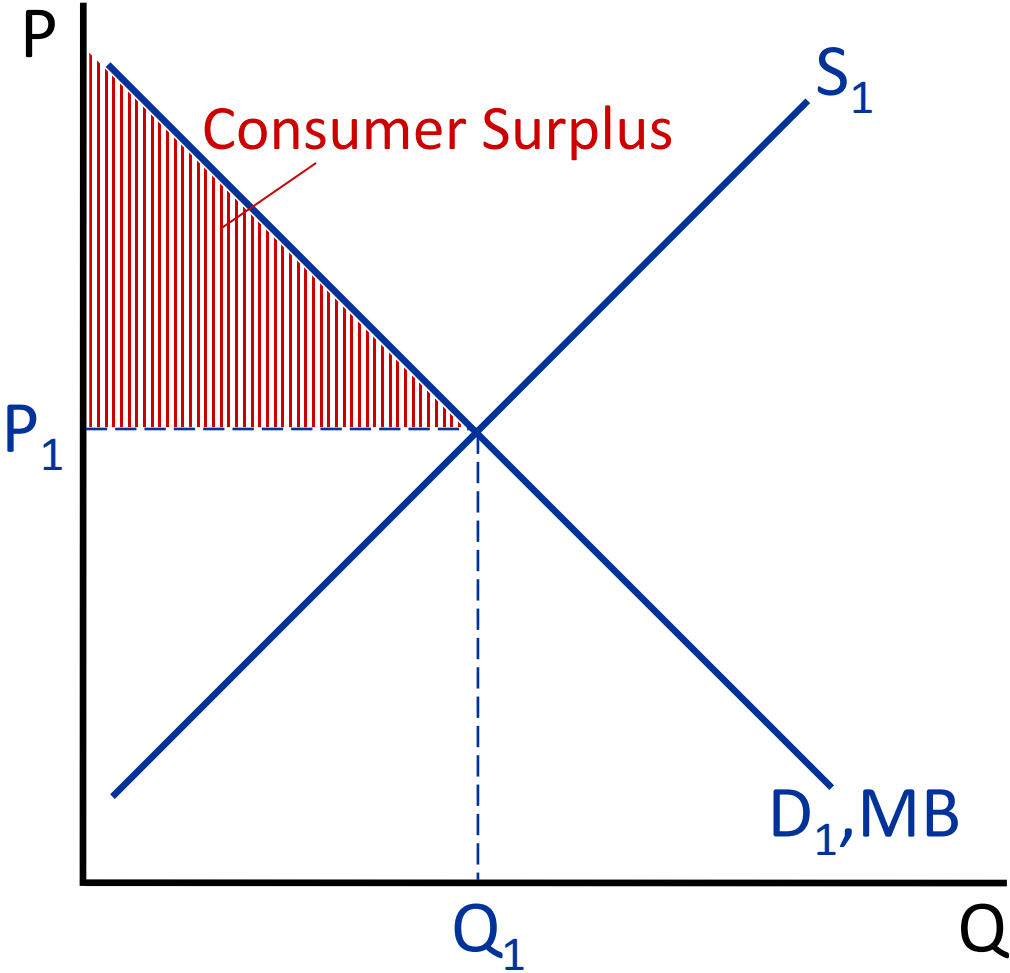


Marginal Benefit



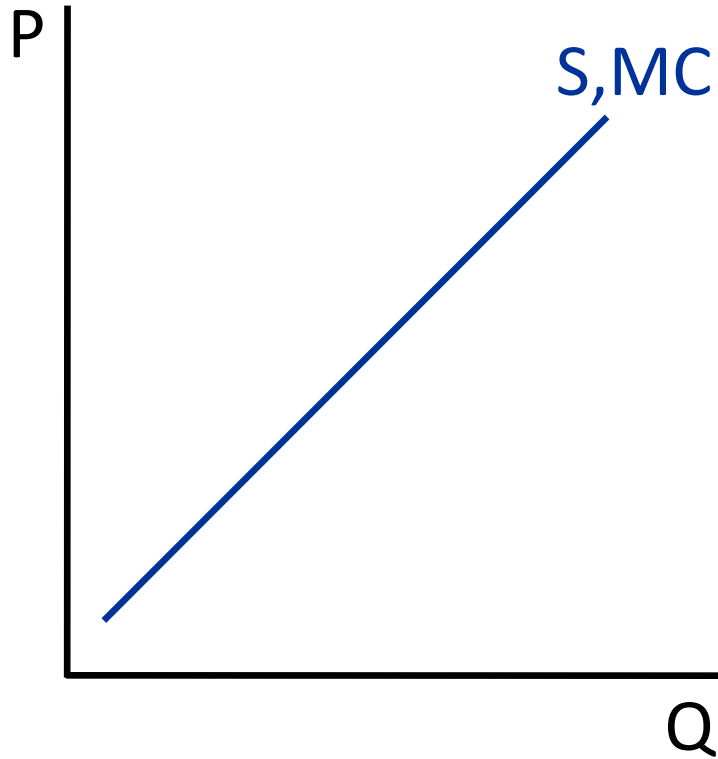
Marginal benefit comes from utility maximization, and depends not only on marginal utility, but also on income, and prices and quantities of other goods.

Consumer Surplus

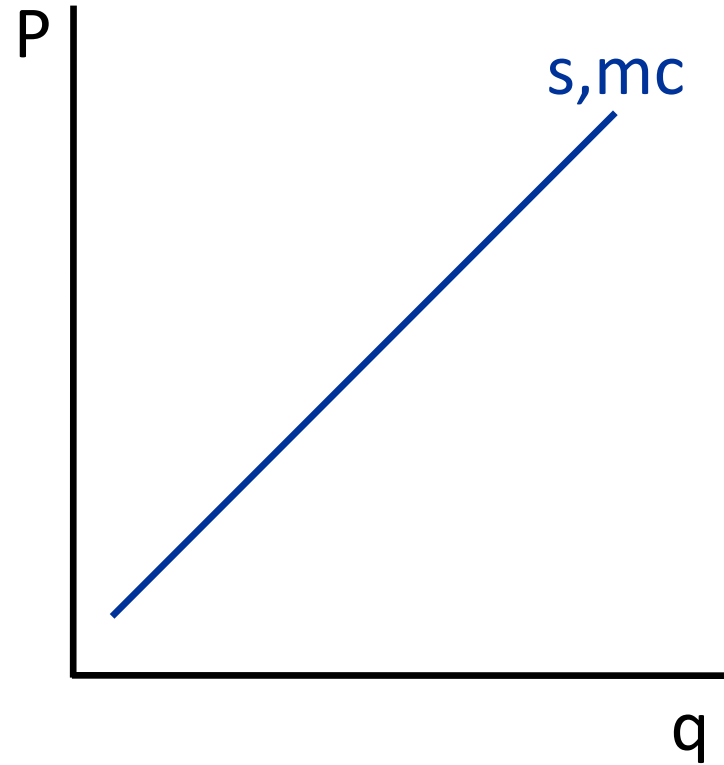


Supply

Market

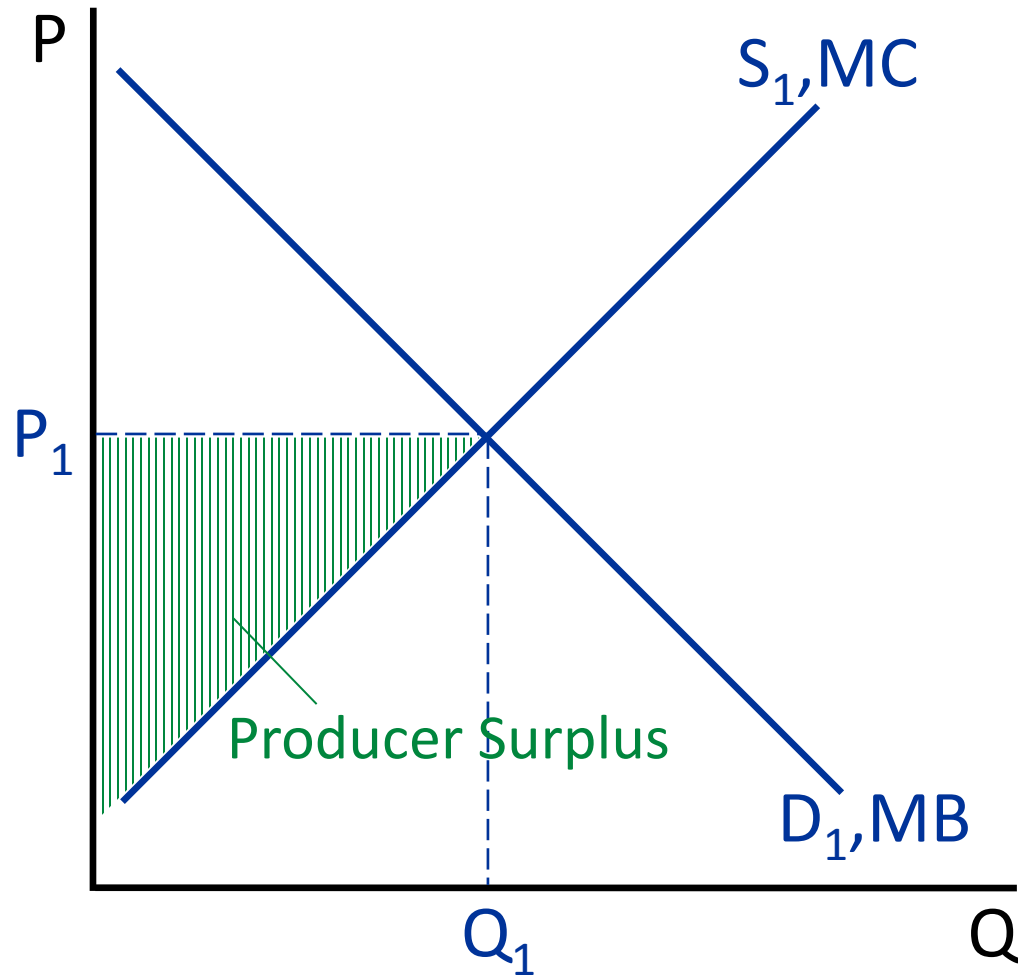


Typical Firm



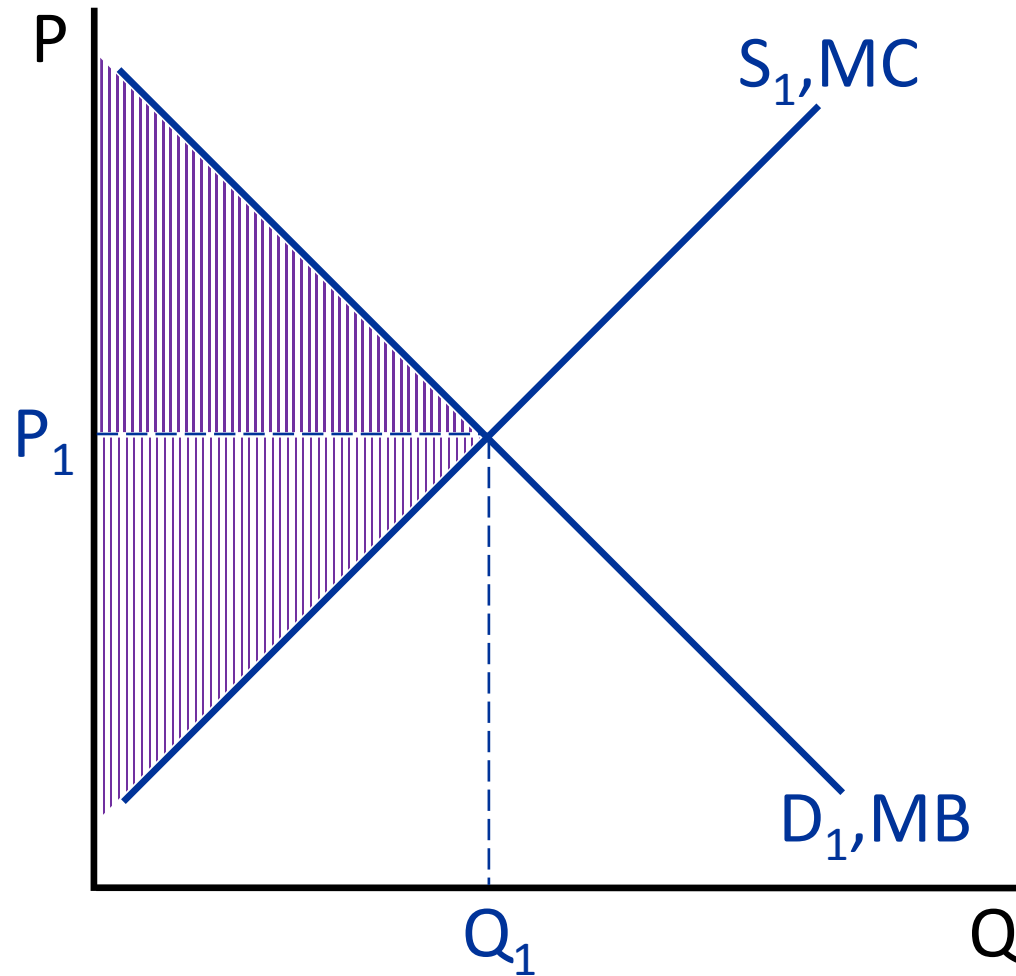
Profit Maximization: $mr=mc=P$

Producer Surplus



III. ALLOCATIVE EFFICIENCY

Total Surplus = Consumer Surplus + Producer Surplus



Area between the MB and MC curves up to the level bought and sold.

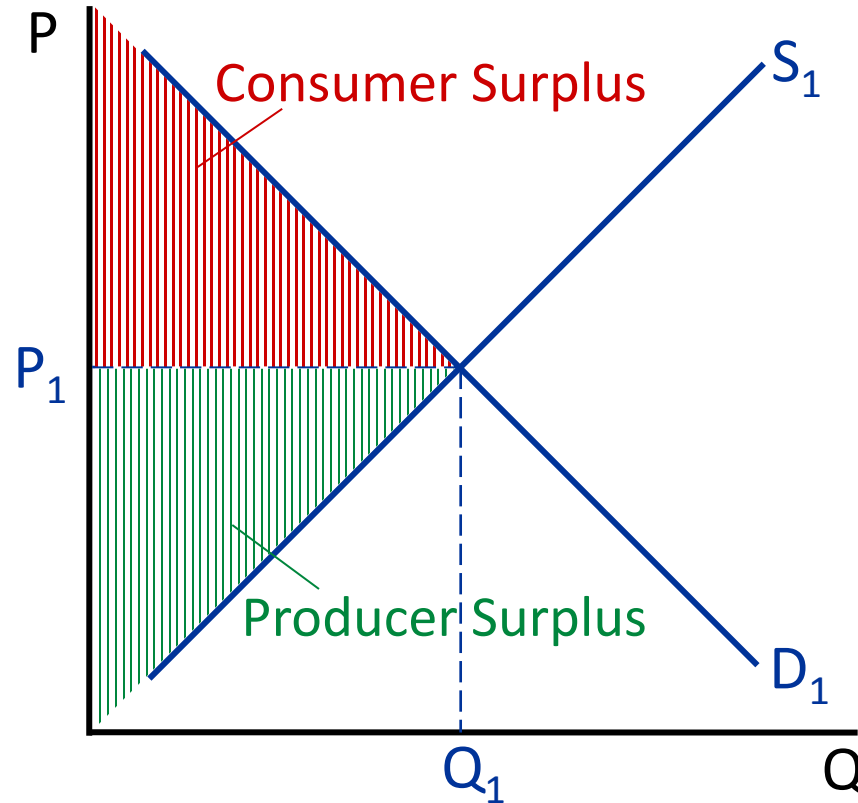
Allocative Efficiency (Also Called Pareto Efficiency)

- The total surplus is as large as possible.

Conditions for Allocative Efficiency

- The good is produced up to the point where $MB = MC$.
- The good is allocated to the consumers with the highest MB.
- The good is produced by the producers with the lowest MC.

Allocative Efficiency of the Competitive Market Outcome



- At Q_1 , $MB = MC$.
- Good is allocated to consumers with the highest marginal benefit.
- Good is produced by suppliers with the lowest marginal cost.

IV. EQUITY AND EFFICIENCY

Equity Issues

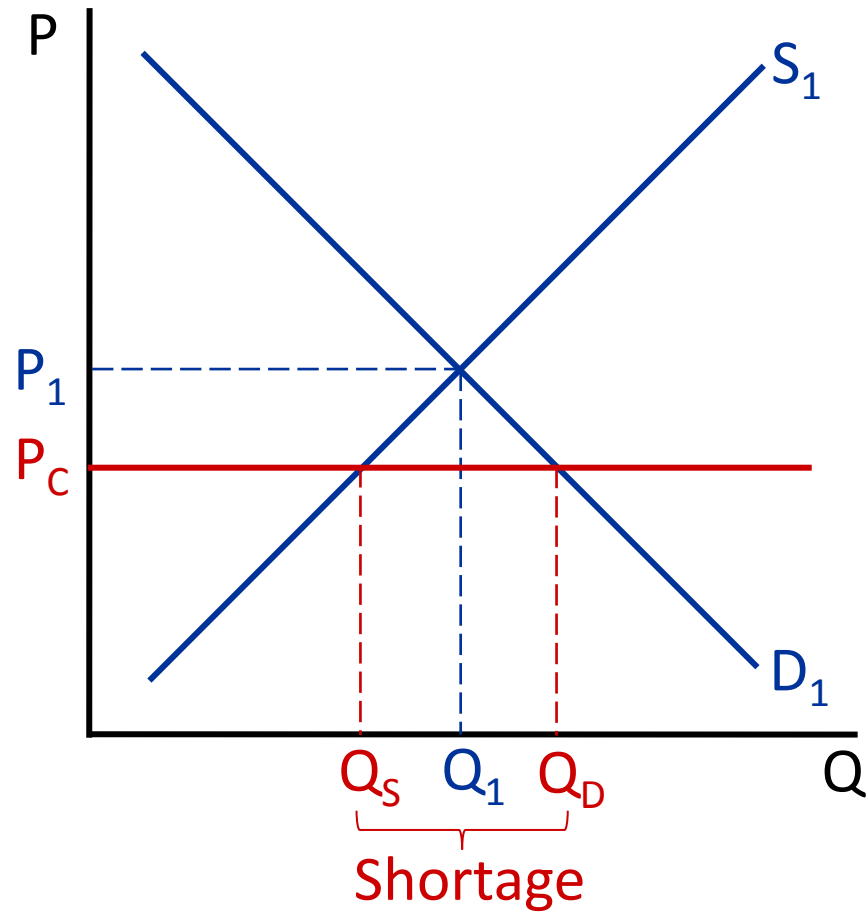
- Willingness to pay (which underlies consumer surplus) depends in part on income.
- Economists' measure of welfare doesn't take into account that consumers may enter the market with vastly different incomes.

Equity and Efficiency

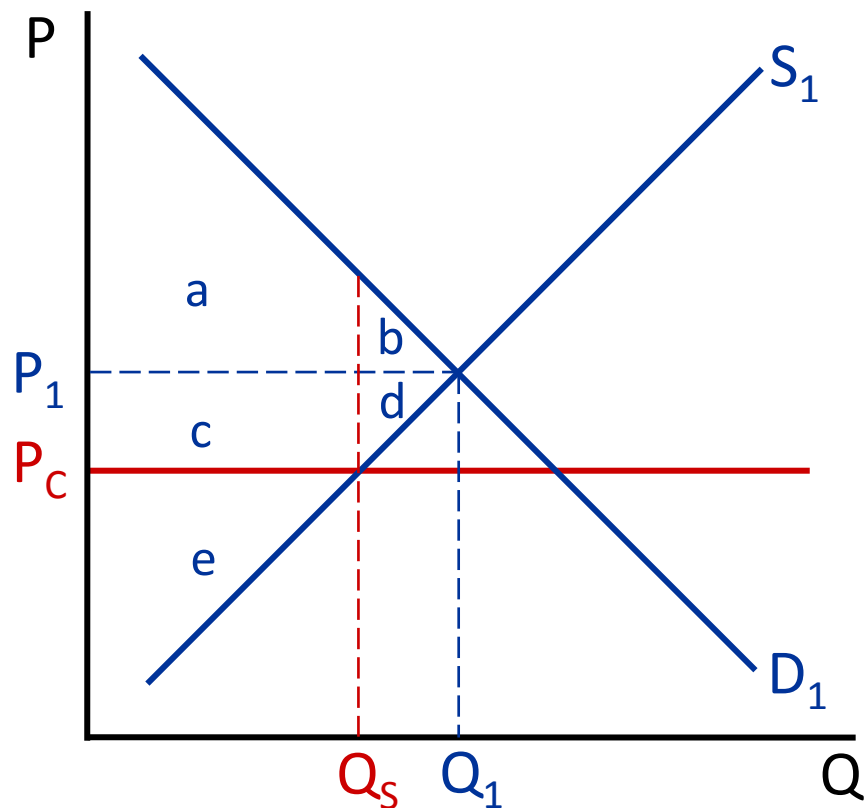
- Allocative efficiency is still a worthy goal.
- Interfering with the price system to improve equity may be costly. (And may not improve equity much.)
- There are ways to improve equity without sacrificing what is good about the price system.

V. WELFARE ANALYSIS OF A PRICE CEILING

Effects of a Price Ceiling



Welfare Analysis of a Price Ceiling



	<u>Free Market (Q_1)</u>	<u>Price Ceiling (Q_s)</u>
Consumer Surplus	a+b	(less than) a+c
Producer Surplus	c+d+e	e
Total Surplus	a+b+c+d+e	(less than) a+c+e
Deadweight Loss		b+d (+ misallocation)

Deadweight Loss

- Any shortfall in total surplus from its maximum level.
- The deadweight loss of a price ceiling is surely larger than $b+d$ because there is *misallocation among consumers*.
 - Consumer surplus is, in fact, *less* than $a+c$ because the good is allocated in some way other than by price.

Glaeser and Luttmer

“The Misallocation of Housing under Rent Control”

- **Look at the overlap percentage:** The fraction of time a member of the group we expect to consume fewer rooms actually consumes more than a member of the group we expect to consume more.
- **Empirical strategy:** Look at the *difference* in the overlap percentage between a city with rent control (NYC) and a number of cities without rent control.

Glaeser and Luttmer

“The Misallocation of Housing under Rent Control”

TABLE 2—AVERAGE OVERLAP IN HOUSING CONSUMPTION BETWEEN POPULATION GROUPS

	Probability that rooms for household from group A > rooms for household from group B			
	New York City renters		U.S. free-market renters	
	Observations	Overlap	Observations	Overlap
Group A: High school dropout ^b	3,174	0.470	4,554	0.316
Group B: College or more	2,450	(0.008)	5,123	(0.005)
Group A: Households without children	6,794	0.229	16,027	0.200
Group B: Households with children	3,206	(0.005)	4,573	(0.004)
Group A: Age $\leq 35^a$	2,859	0.279	10,456	0.343
Group B: Age > 35 and ≤ 60	4,280	(0.006)	5,381	(0.005)
Group A: 1 person households	3,758	0.150	10,261	0.150
Group B: 3+ person households	3,621	(0.005)	4,483	(0.004)
Group A: Per capita income in bottom $\frac{1}{3}^c$	3,338	0.457	6,798	0.351
Group B: Per capita income in top $\frac{1}{3}$	3,300	(0.007)	6,795	(0.005)

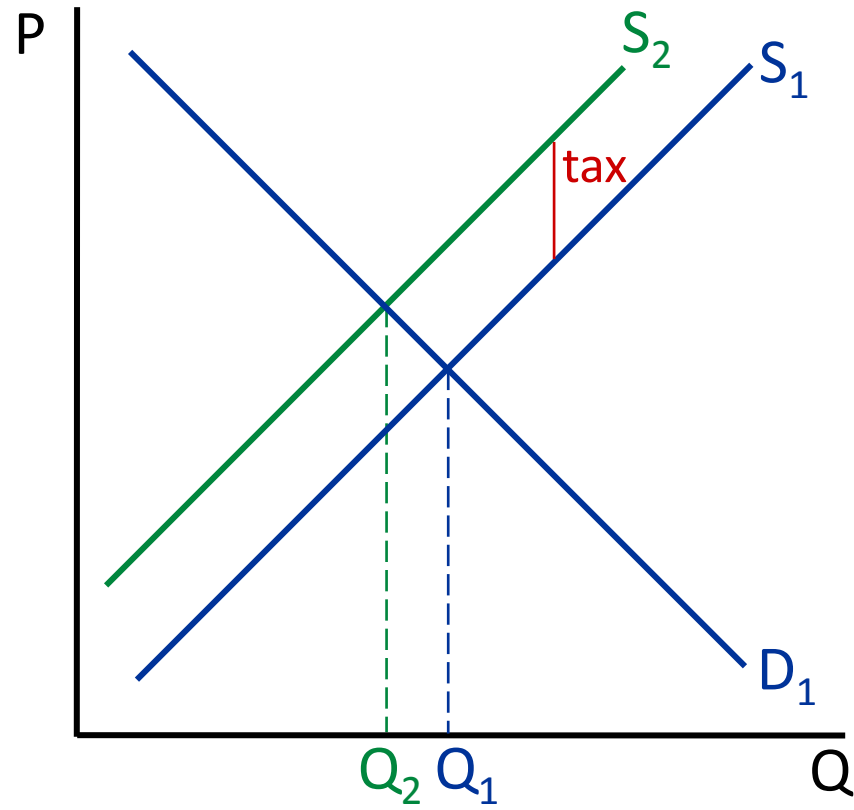
Source: Glaeser and Luttmer, “The Misallocation of Housing under Rent Control.”

Equity Issues Related to Rent Control

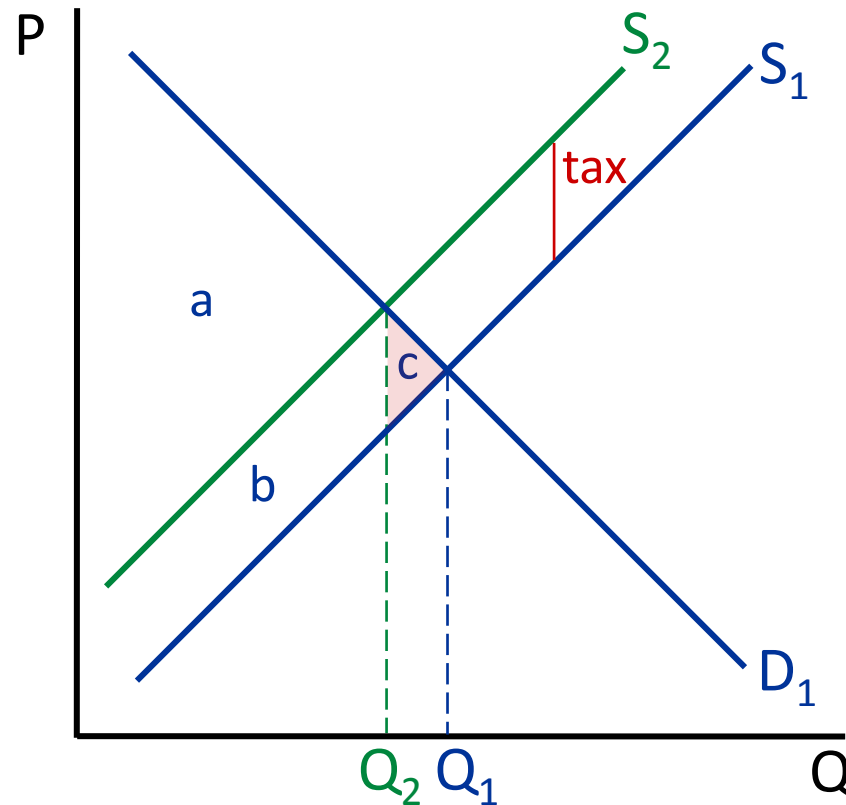
- Who benefits from rent control?
- Who is harmed?
- Are there other ways of helping poor renters?

VI. WELFARE ANALYSIS OF A TAX

Effect of a Tax



Welfare Analysis of a Tax

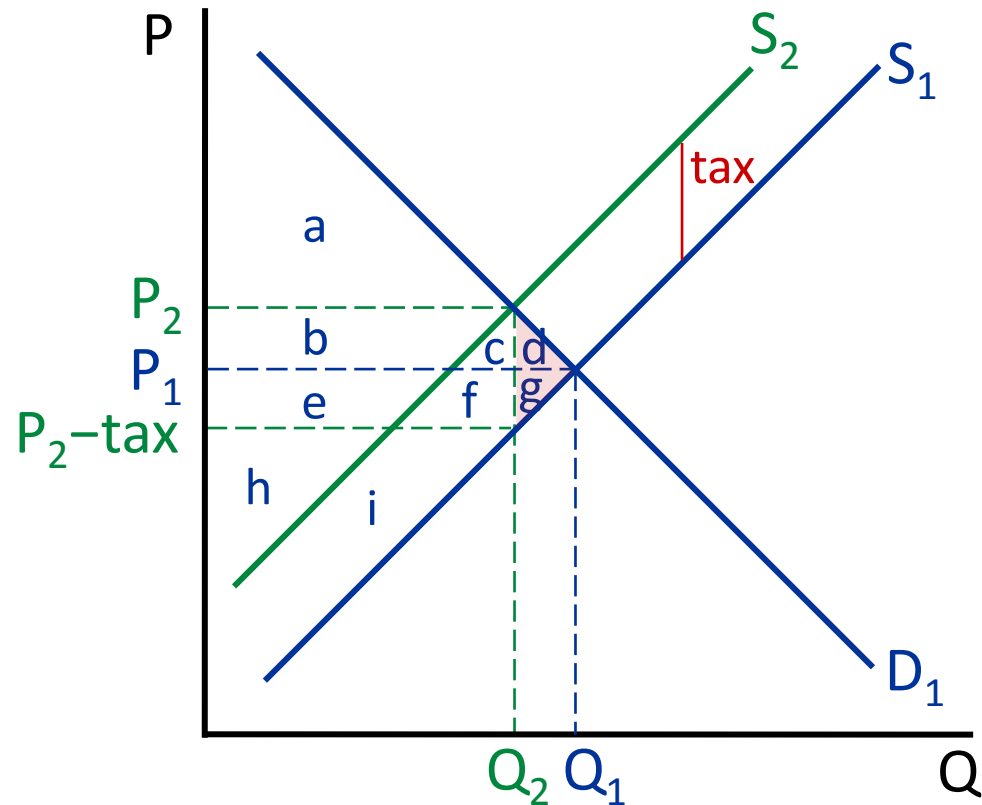


	<u>Free Market (Q_1)</u>	<u>Tax (Q_2)</u>
Consumer and Producer Surplus	a+b+c	a
Government Revenue		b
Total Surplus (includes revenue)	a+b+c	a+b
Deadweight Loss		c

Some Points about the Welfare Effects of a Tax

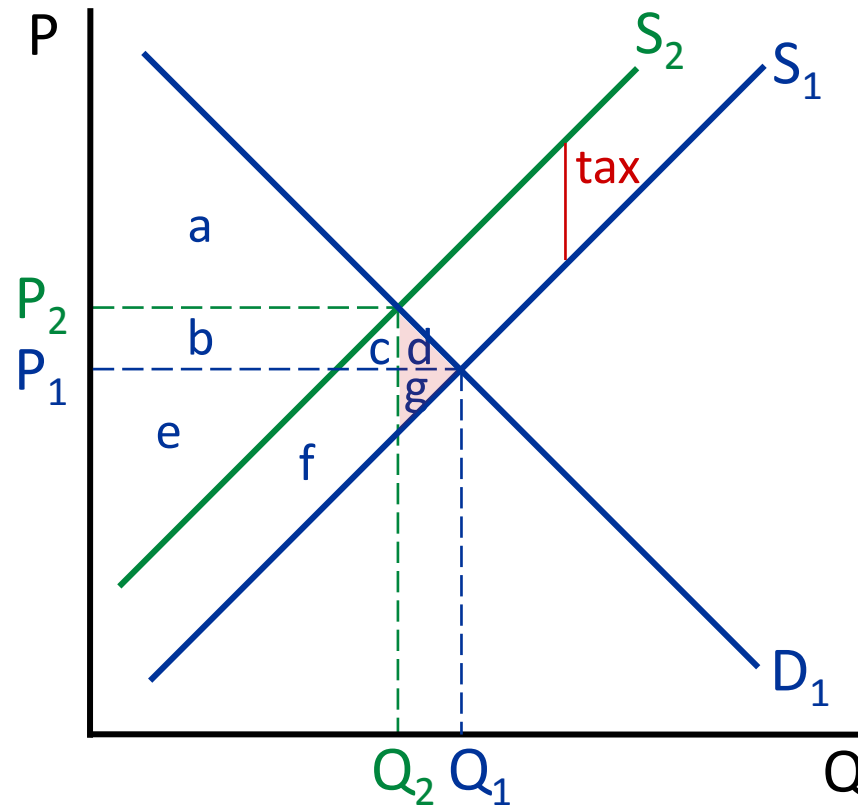
- The revenue the government collects from the tax is part of the total surplus. In the diagram, area a is the sum of producer and consumer surplus, and area b is government revenue.
- A tax distorts production away from the competitive equilibrium, so at the resulting level of production and consumption $MB > MC$.
- Production and consumption are still allocated according to willingness to pay and willingness to supply, so there is no misallocation.

Detailed Welfare Analysis of a Tax (Version 1)



	<u>Free Market (Q_1)</u>	<u>Tax (Q_2)</u>
Consumer Surplus	$a+b+c+d$	a
Producer Surplus	$e+f+g+h+i$	$h+i$
Government Revenue		$b+c+e+f$
Total Surplus	$a+b+c+d+e+f+g+h+i$	$a+b+c+e+f+h+i$
Deadweight Loss		$d+g$

Detailed Welfare Analysis of a Tax (Version 2)



	<u>Free Market (Q_1)</u>	<u>Tax (Q_2)</u>
Consumer Surplus	$a+b+c+d$	a
Producer Surplus	$e+f+g$	$b+e$
Government Revenue		$c+f$
Total Surplus	$a+b+c+d+e+f+g$	$a+b+c+e+f$
Deadweight Loss		$d+g$