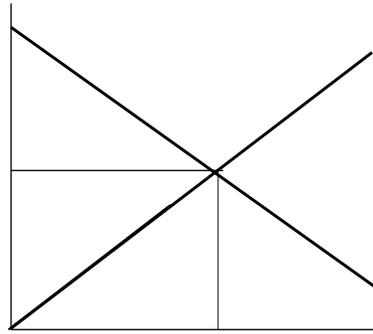


Overview: Analysis of Competitive Markets

- **Brief Review**
 - Market Equilibrium and Surplus
 - Examples: Welfare Analysis of Government Intervention
 - Tax
 - Quota
- **The US Sugar Price Support Program**
 - How does it work?
 - Who are the winners and losers?

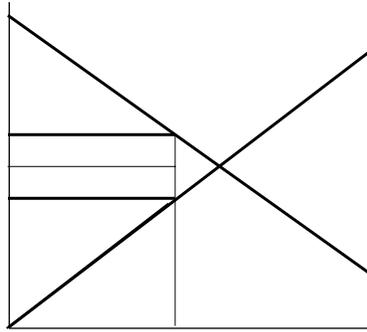
Market Equilibrium and Surplus



Concepts: Market Equilibrium

- Demand, Supply, Market Equilibrium
- Consumer Surplus, Producer Surplus
- Total Revenue

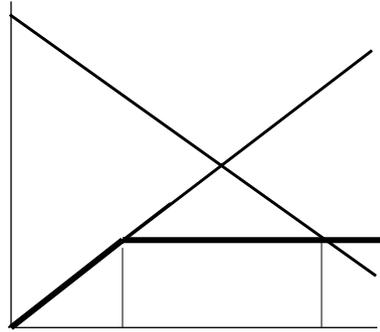
Example: Imposition of a Tax



Concepts: Imposition of a Tax

- Two Prices: Before and After Tax
- Equilibrium
- Consumer and Producer Surplus
- Government Revenue
- Dead Weight Loss
- Incidence of a Tax (Who pays?)
 - Fraction ‘paid’ by buyers is $E_s/(E_s - E_d)$
 - “Pass Through Formula”

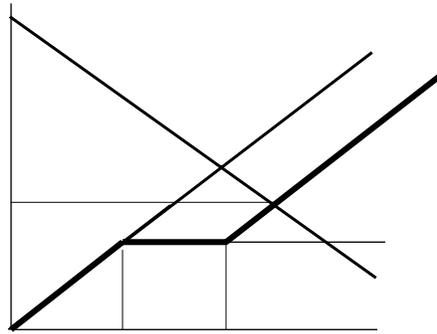
Example: Imports



Concepts: Imports

- Elastic World Supply
- Total Supply
- Equilibrium

Example: Import Quota



Concepts: Import Quota

- Impact of an Import Quota
- Tariff and Import Quota Equivalent or Not?

The U.S. Sugar Price Support Program

- How do market stabilization prices work?
- Aims of sugar price support program?
- Why quota rather than a tariff?

Analysis of U.S. Sugar Program

- Quantify transfers and deadweight losses.
- Objective:
 - Get practice with market analysis
 - Determine winners and losers
 - Get idea of the size of the effects
- (Simple) Modeling of the sweetener market
 - Using 2000 data, assumptions as given before.
 - Assume sugar and HFCS are perfect substitutes
 - Need Demand, Supply, etc.

Assumptions: Analysis of U.S. Sugar Program

Market for sweetener with HFCS

- $E_s = 1.53$, $E_d = -0.3$
- $Q(\text{demand}) = 38.6 \text{ bil lbs}$
- $Q(\text{sugar supply}) = 19.4$
- $Q(\text{hfcs supply}) = 15.7$ at a price of 11.3c
 - hfcs supply perfectly elastic on 1-15.7 bil. lbs.
 - hfcs supply perfectly inelastic above 15.7 bil. lbs.
- Ignore Canada
- Use US cents/lb
- World price = 11c/lb. US price 21.8c/lb.

US Sugar Program - 2000 Data

- Domestic Demand for Sweetener

- $Q^{US} = 20.2 + 18.4 = 38.6$ bill. lbs; $P = 21.8$ c/lb; $E_d = -0.3$

- “Back of the Envelope” Approach:

$$E_d = \frac{P}{Q} \frac{\partial Q}{\partial P} \Rightarrow b = E_d * \frac{Q}{P}$$

$$a = Q - bP$$

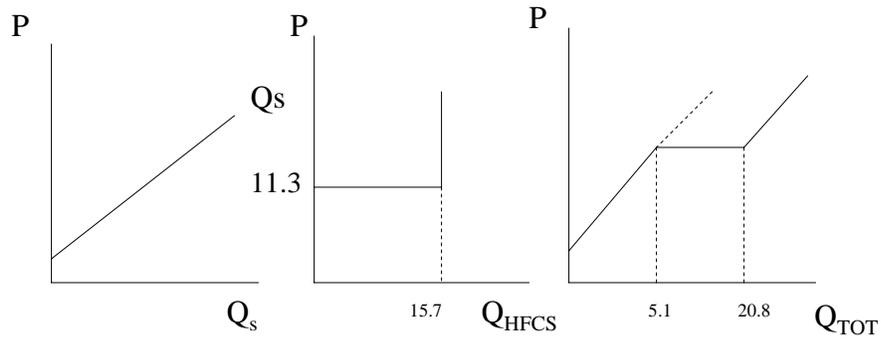
- So $b = -0.3 * 38.6 / 21.8 = -0.53$; $a = 38.6 - (-0.53) * 21.8 = 50.1$

- Namely, $Q_d = 50.1 - 0.53 P$

- Domestic Supply for Sugar

- By Same Method: $Q_s = -10.3 + 1.36 P$

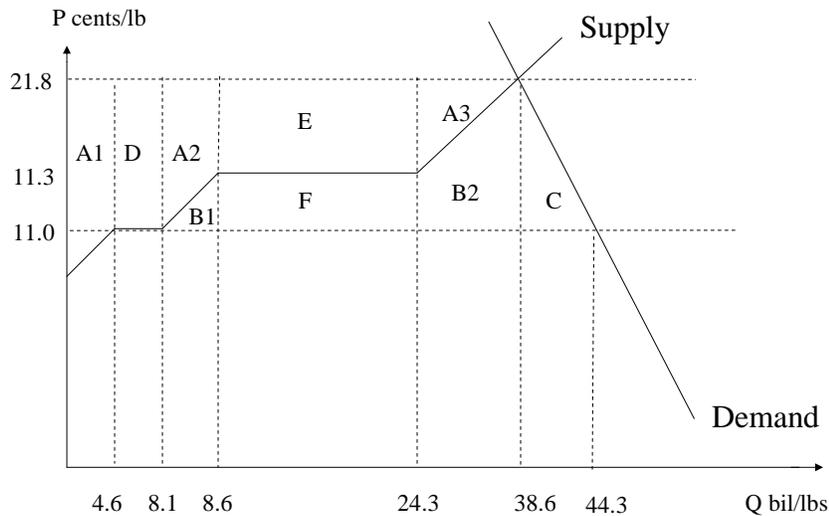
Sugar + HFCS = Sweetener Supply



HFCS:

- 0-15.7 perfectly elastic supply
- >15.7 perfectly inelastic supply

Analysis of the Quota in the Sweetener Market



Surplus Analysis: Highlights

- Extra Producer Surplus for Domestic Firms = $A_1 + A_2 + A_3$
= \$1.3 bil (non HFCS)
- Surplus on HFCS = $E = \$1.65$ bil
- Extra Cost of Domestic Production = $B_1 + B_2 = \$794$ mil
- Change In Consumer Surplus = $A + B + C + D + E + F = \4.48 bil
- Revenue to Importers = $D = \$378$ mil
- Deadweight Loss = $B + F + C = \$1.15$ bil

Surplus Analysis in Practice

- More Extensive Analysis Involves Data and Econometric Estimation of Equations
- Example: Demand for Sweetener in Candy Production

$$\ln(Q_{\text{sweet}}) = 2.83 - .32 \ln(P_{\text{sweet}}) + .62 \ln(\text{CandyShip})$$

- Annual Data, 1981-1995, Source Haley (1998)
- Q_{sweet} : Quantity of Sweetener
- P_{sweet} : Price of Sweetener
- CandyShip: Amount candy shipped

Take Away Points

- Surplus is the value created by trade.
- Surplus Analysis quantifies distortions and transfers.
- Politics impacts economics and business strategy
 - Sugar Quota has geopolitical ramifications
 - HFCS profits depend on quotas
 - Anti-trust, taxes, regulations, ...