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[C&B Ch. 7; S&W Ch.10]

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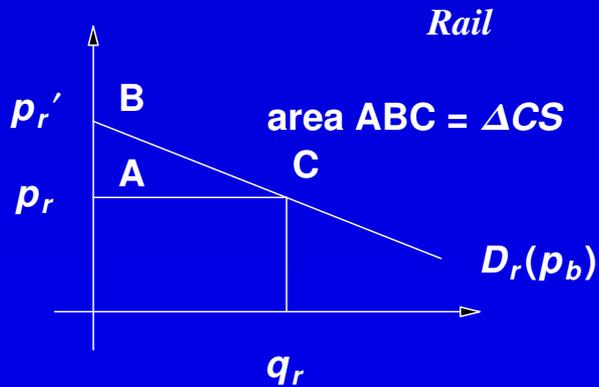
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∴ Loss of consumer's surplus.

**Graphically:**

$$\Delta Q \neq 0$$
$$\Delta P = 0$$



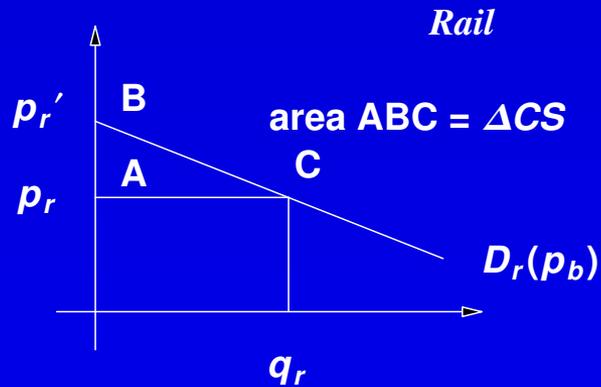
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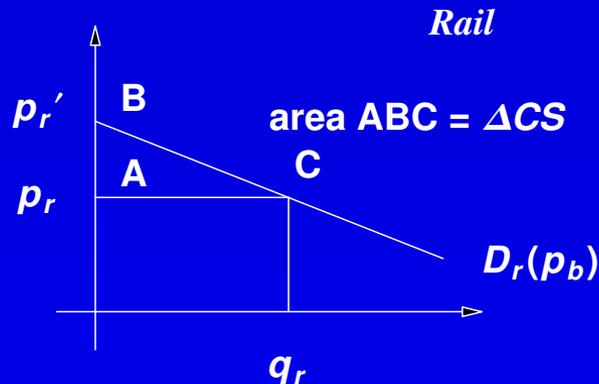
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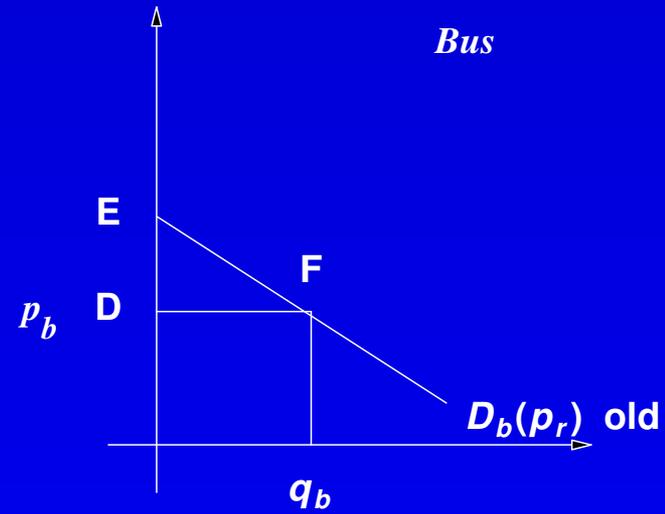


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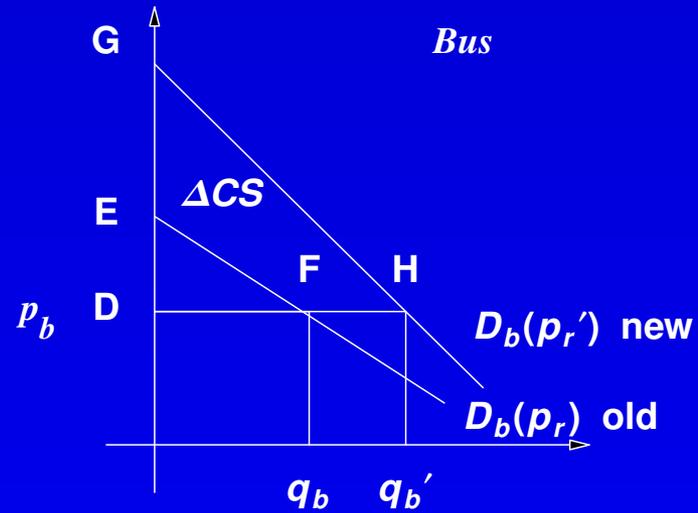
- initially  $(p_r, q_r)$  at C
- finally  $(p_r', q_r' = 0)$  at B as if price  $> p_r'$  (choke price)  
∴ zero demand

∴ area ABC is the loss of Consumer Surplus,  $\Delta CS$ .

## But what happens in the bus market?

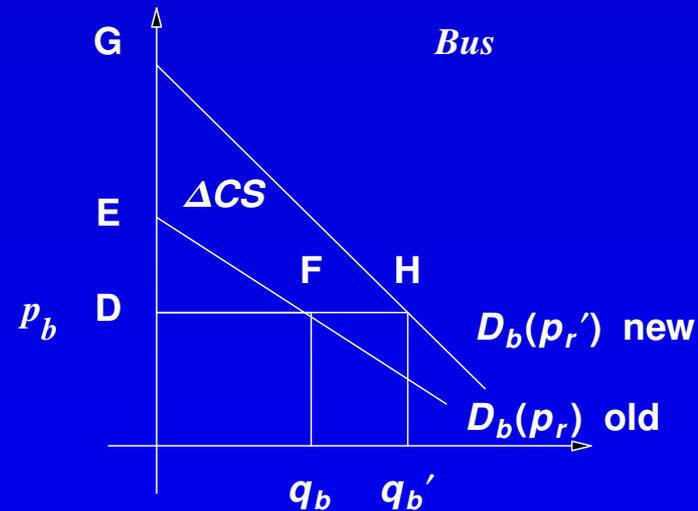


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Then  $\Delta CS$  = area EFHG is *not* a social benefit of rail closure—consumers' surplus measures what consumers are willing to pay, in excess of what they are actually called on to pay, to consume a good.

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**Remember: the demand curve for railway travel already included the rail passengers' realisation of the alternative travel opportunity of using the bus instead.**

**Or, the social loss that would be caused by closing the *bus* service would be greater if there were no alternative rail service than if there were such a service.**

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*$\Delta CS$  with a good measures a change in consumers' welfare only if the change in surplus is caused by a change in that good's price or availability, not changes in a substitute's or a complement's price or availability.*

## Price Changes and $\Delta CS$ : Conclusion

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The increase of the area of consumers' surplus in the other good (bus) ( $P_y = \text{constant}$ ) is *not* to be regarded as a gain of consumers' surplus consequent upon the rise in  $P_x$ , the train.

This increase is simply the consequence of consumers' bettering themselves by switching from the higher priced good  $x$  to substitute good  $y$ .

Provided supply prices are constant, then the ceteris paribus conditions are met, and the partial analysis depicts the consumers' gains wholly within the area of the demand curve of the good whose price has risen—irrespective of the resulting magnitude and direction of the shifts in demand for all other goods in the economy.

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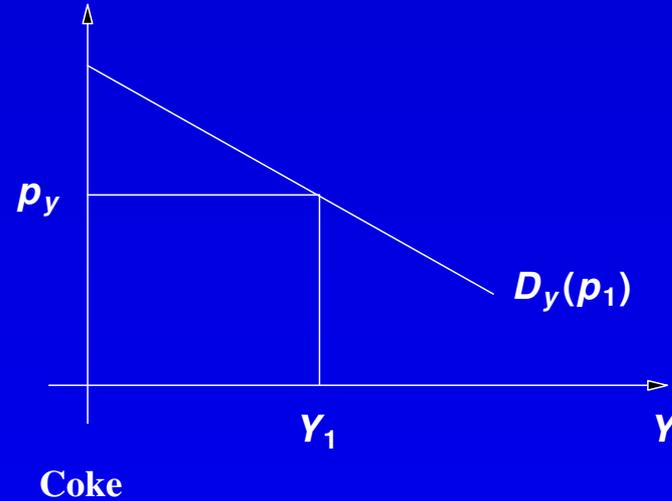
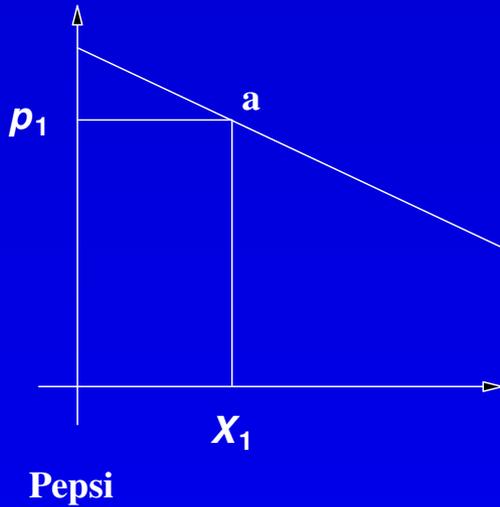
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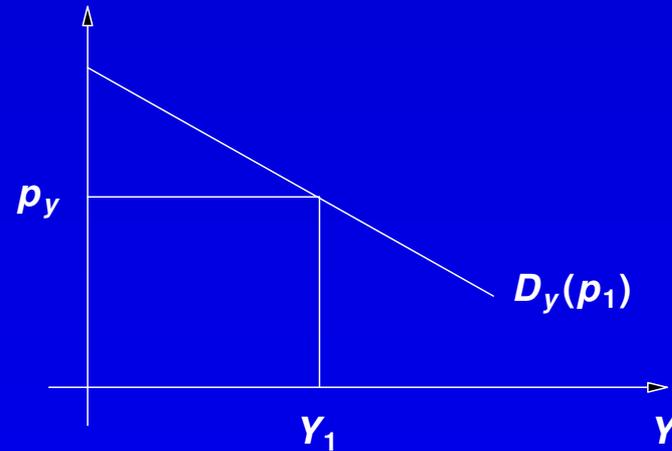
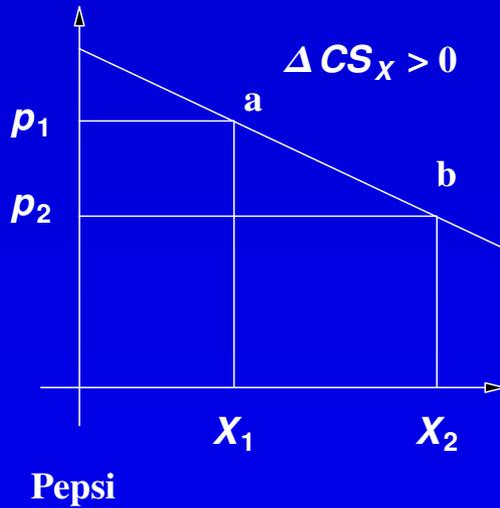
- They may lead to double counting of benefits, which should be net of costs, not gross.
- They may measure transfers, as seen above.

**[See DoF 3.11; see also C&B Ch. 13, on Economic Impact Analysis]**

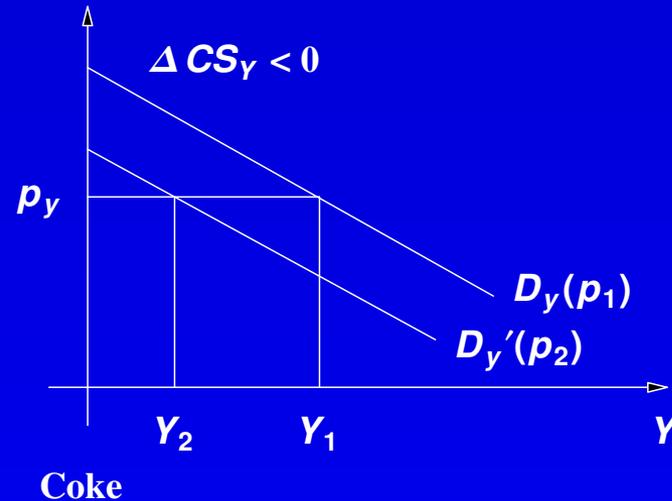
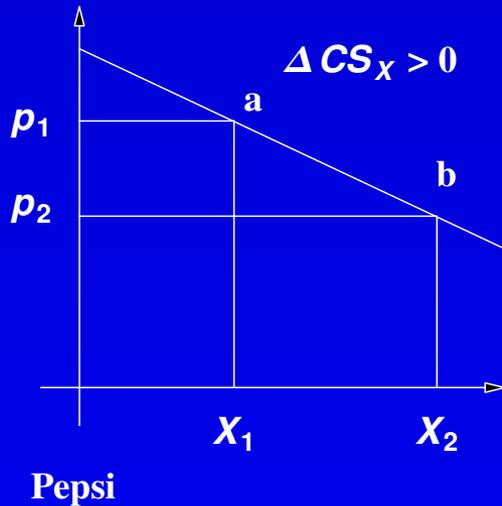
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$$p_1 X_1 + p_y Y_1 = \bar{M}$$

$$p_2 X_2 + p_y Y_2 = \bar{M}$$

**$\Delta CS?$**

**$\Delta$  social welfare? =  $\Delta CS_X$  only. (Pepsi)**

**Ignore the induced change in  $CS_Y$ . (Coke)**

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So long as *price = marginal cost*, and doesn't change in response to a project, then *indirect* (i.e. in another market) net marginal social cost or benefit equals zero.

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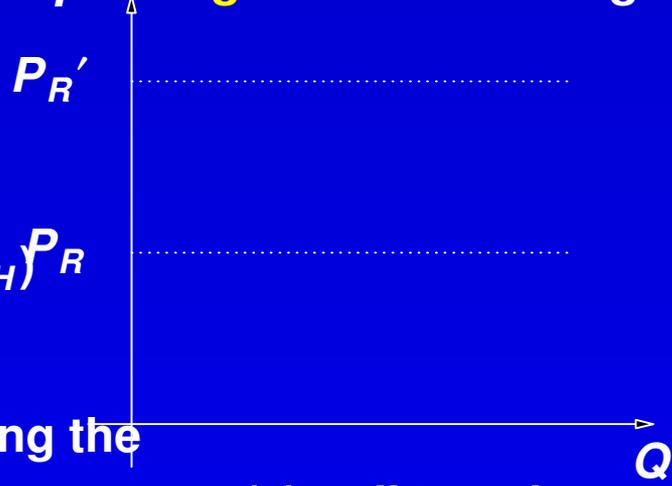
**Katoomba Rail and Renting  $\Delta$  CS in Housing:**

e.g. Katoomba

rail:  $(P_R, Q_R)$

housing:  $(P_H, Q_H)$

considering raising the price of railway



$P_R \rightarrow P_R'$

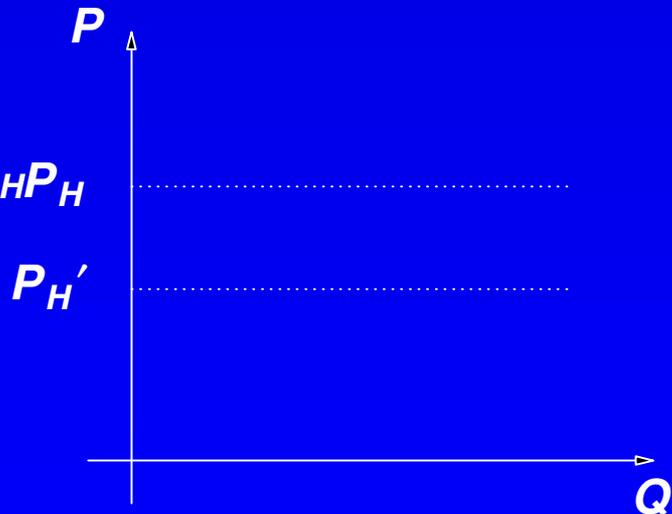
$\rightarrow$  reduction in  $D_H P_H$

$\rightarrow$  fall in  $P_H$

$\rightarrow P_H'$

fall in  $Q_H$

$\rightarrow Q_H'$



(b) housing

## Katoomba: Dynamics and Changer in Surplus

Fall in  $P_H \rightarrow P_H' \rightarrow$  increase in  $D_R \rightarrow D_R(P_H')$   
 $\rightarrow$  new quantity of trips  $Q'_R$

Fall in consumers' surplus in railway market (/////)

Rise in consumers' surplus in housing market (\\\\\\)

$\therefore$  net effect on consumers is (/////) $-$ (\\\\\\), a reduction in consumers' surplus

$\therefore$  net effect on society (cons. + prod.) =  $\Delta$  CS in rail-travel market, since housing markets changes cancel.

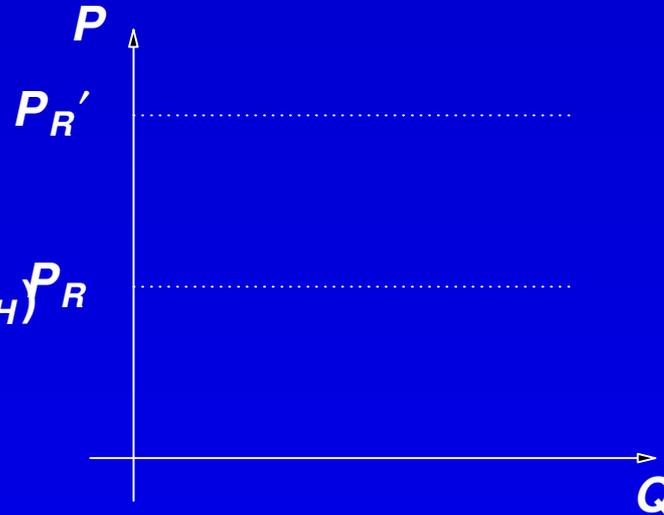
Area \\\ is a transfer: from landlords to tenants.

e.g. **Katoomba**

rail:  $(P_R, Q_R)$

housing:  $(P_H, Q_H)$

raising the price of railway



(a) rail travel

$P_R \rightarrow P_R'$

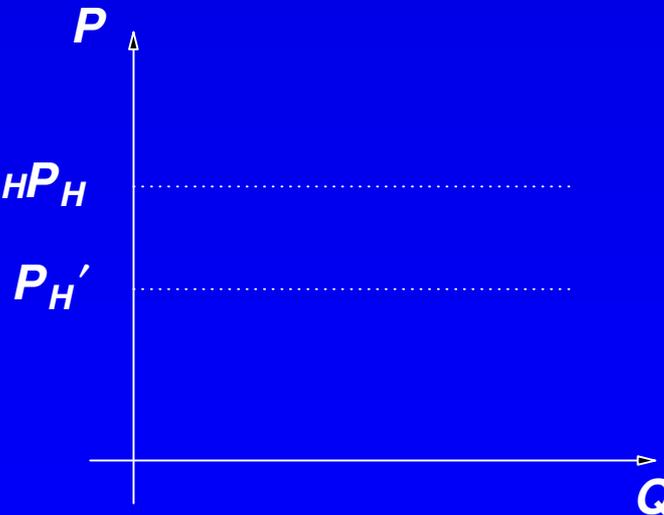
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(b) housing

## Katoomba: Dynamics

**A:**  $(P_R, Q_R)$  &  $(P_H, Q_H)$  initial

**B:**  $(P_R', Q_R')$  &  $(P_H', Q_H')$  final

**C:**  $(P_R, Q_R')$  &  $(P_H, Q_H')$  old prices, new quantities

**D:**  $(P_R', Q_R)$  &  $(P_H', Q_H)$  new prices, old quantities

**A preferred to C**  $\Rightarrow$  losses of **A**  $\rightarrow$  **B**  $\geq$  losses of **C**  $\rightarrow$  **B**

**B preferred to D**  $\Rightarrow$  losses of **A**  $\rightarrow$  **B**  $\leq$  losses of **A**  $\rightarrow$  **D**

$\therefore$  losses of **C**  $\rightarrow$  **B**  $\leq$  losses of **A**  $\rightarrow$  **B**  $\leq$  losses of **A**  $\rightarrow$  **D**

$\therefore Q_R'(P_R' - P_R) - Q_H'(P_H - P_H') \leq$  losses of **A**  $\rightarrow$  **B**  $\leq$   
 $Q_R(P_R' - P_R) - Q_H(P_H - P_H')$

***Katoomba cont.***

e.g. Initially

$$\begin{array}{l} P_R = \$5/\text{trip} \\ P_H = \$50/\text{week rent} \end{array} \quad \} \rightarrow \quad \begin{array}{l} 10,000 \text{ trips/week} = Q_R \\ 1,000 \text{ tenants} = Q_H \end{array}$$

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$$\begin{array}{l} P'_R = \$6/\text{trip} \\ P'_H = \$47.50/\text{week rent} \end{array} \rightarrow \begin{array}{l} 9,000 \text{ trips/week} = Q'_R \\ 980 \text{ tenants} = Q'_H \end{array}$$

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Then net *loss* to consumers:

$$\begin{aligned} &= (6 - 5) \frac{(10,000 + 9,000)}{2} - (50 - 47.5) \frac{(1,000 + 980)}{2} \\ &= \$9,500 - \$2,475 = \$7,025/\text{week} \end{aligned}$$



## Katoomba: Net losses

***Thus ∴ net loss to consumers & landlords  
= shaded are in (a) = \$9,500/week***

**(Because shaded area in (b) cancels out—is a transfer from landlords to tenants & is solely a price effect.)**

**Conclusion:**

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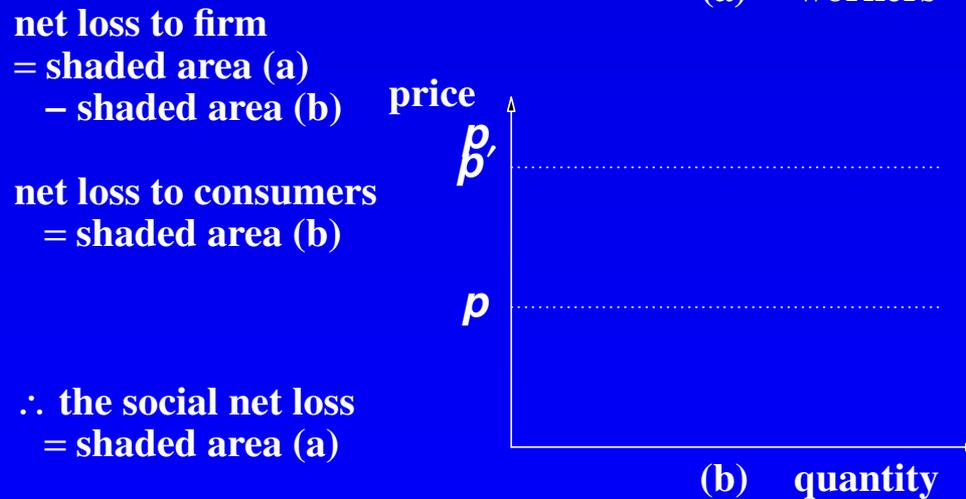
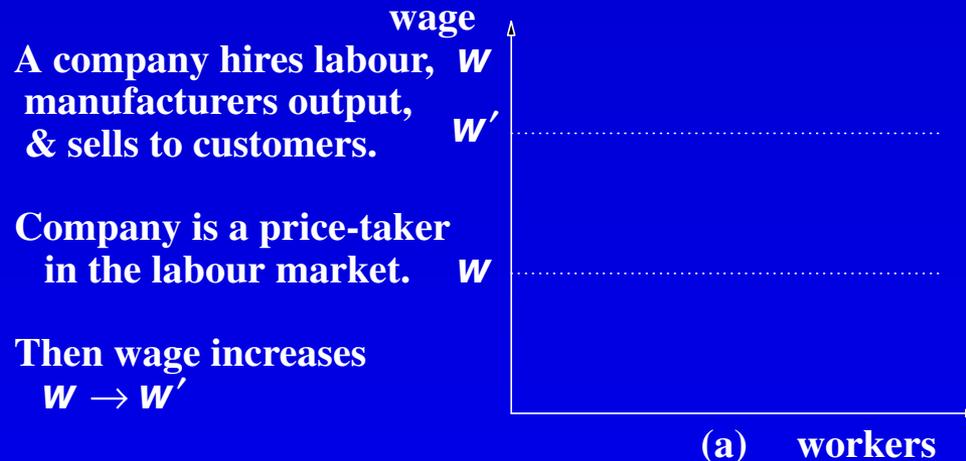
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**Conclusion:**

**with *Pecuniary External Effects*, we need only consider the effect on Consumers' Surplus and Producers' Surplus in the primary market.**

## 2. Induced Price Changes



If PPIC is sole criterion, then weight consumers = producers (a \$ is a \$) & need not look at induced price changes in competitive markets for Pecuniary External Benefit.

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- Several techniques to value external costs or benefits: different values according to whether *willingness to pay* (to avoid a cost) or *willingness to accept* (in compensation), since different underlying property rights.
- For large projects, benefits should include *the change in consumer surplus*, which depends on the price elasticity of demand.



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  - If both incremental and displacement effects are present, then the *shadow price is a weighted average*.



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- **For valuing the costs and benefits of a project, markets provide much information at little cost. How justified is the need for the development of more accurate shadow prices? A CBA of a proposed CBA!**

**Overriding principle:*****Opportunity cost***

<b>transfers:</b>	<b>no opportunity cost</b>
<b>buyers:</b>	<b>tax-inclusive price, what they pay</b>
<b>sellers:</b>	<b>economic cost (net-of-tax), what they get</b>

**CBA always concerned with incremental costs and benefits, that is, with effects that would not have occurred in the absence of the project — DoF (1991).**

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