Lecture 3: Tax incidence

Economics 336/337

University of Toronto

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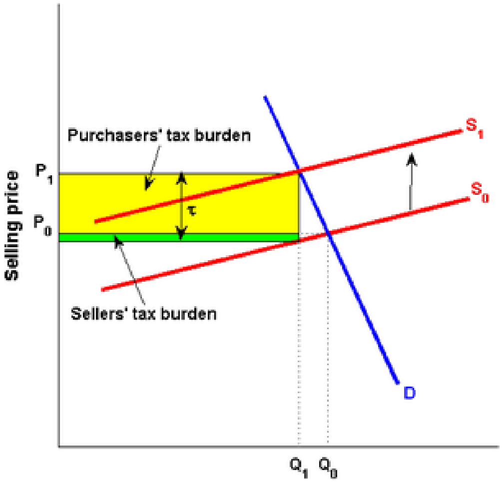

Incidence and elasticities

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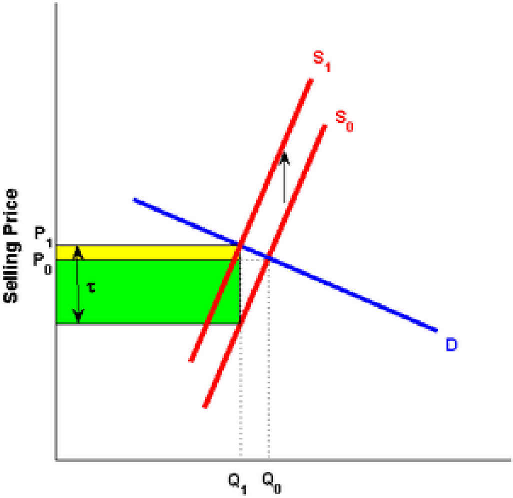

Algebraic approach

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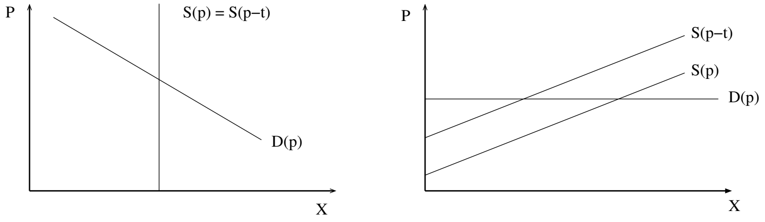

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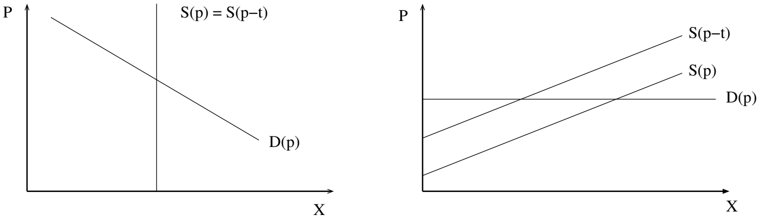

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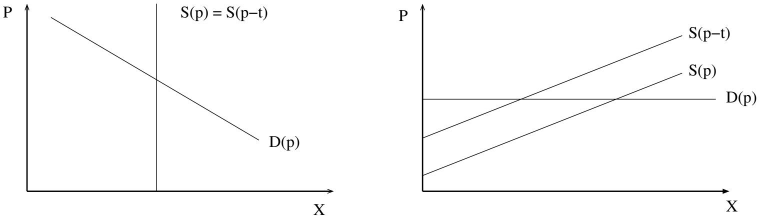

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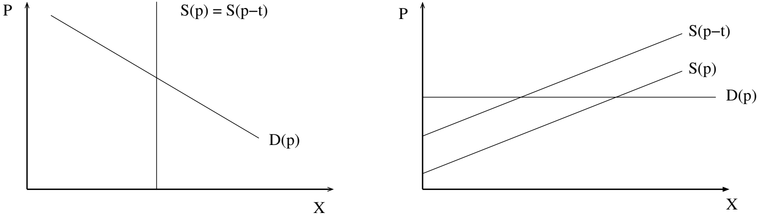

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- When supply is perfectly elastic or demand is perfectly inelastic, then tax is fully borne by: purchaser. Exercise: Draw the relevant graphs to show this.

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4. A withholding tax on dividends paid to foreign shareholders of Canadian corporations. If Canada is a small open economy, who bears this tax? Hint: first consider a tax on *all* capital in a SOE.

Tax incidence over time

Backward shifting may take an extreme form when taxes (or subsidies) affect asset values.

Example: Consider a house that rents for $\$R_t$ and pays $\$\tau_t$ in property taxes in year $t = 1, 2, \ldots$. If the property has no alternative uses, its market value at date 0 is

$$P_0 = \sum_{t=1}^{\infty} \frac{R_t - \tau_t}{(1+i)^t}$$

where i is the interest rate. (Why?)

Present discounted value and the "no arbitrage" condition

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Recursively substituting for $t = 1, 2, \ldots$ gives

$$P_0 = \frac{1}{1+i}(R_1 - \tau_1) + \frac{1}{(1+i)^2}(R_2 - \tau_2) + \ldots$$

A permanent increase in taxes $\Delta\tau, \Delta\tau, \ldots$ causes house price to fall by

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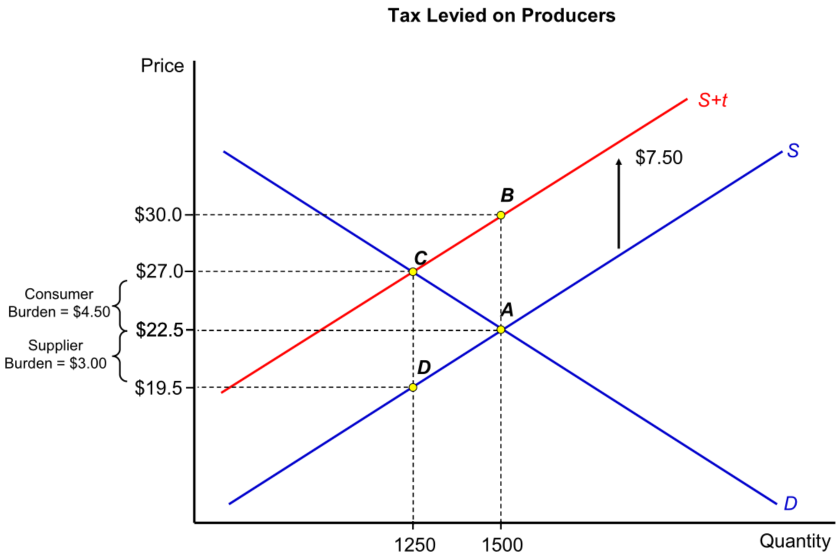
So $p^* = \hat{p} + t$: Statutory incidence is irrelevant.



Tax Levied on Producers
Price
S+t
$7.50
S
B
$30.0
C
$27.0
Consumer
Burden = $4.50
A
$22.5
Supplier
Burden = $3.00
D
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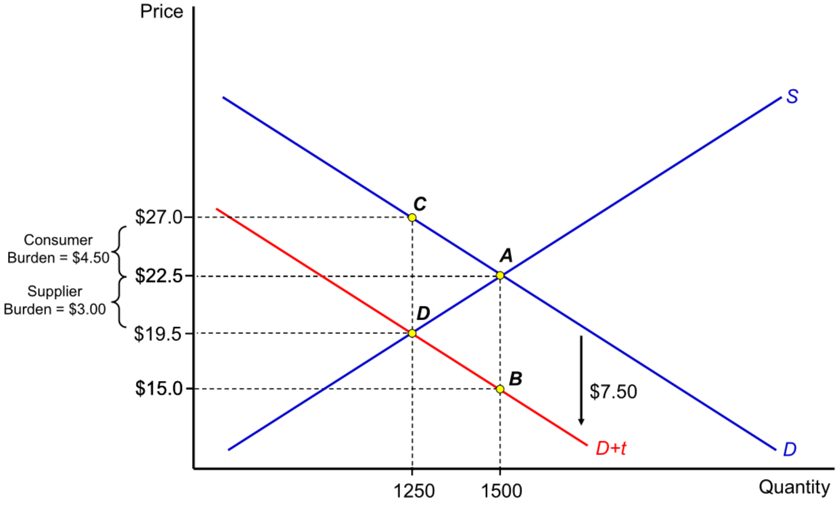
D
1250
1500
Quantity

Tax Levied on Consumers



Statutory incidence: Qualifications

Our result on the irrelevance of statutory incidence requires that prices can fully and immediately adjust in response to the tax. So in cases with imperfect adjustment, statutory incidence can matter:

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Exercise

If workers are paid the minimum wage, how does economic incidence of a payroll tax change with the statutory incidence?

Incidence in non-competitive markets

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There is some evidence that these taxes are *overshifted*: prices on average rise by more than 100% of the tax increase.

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A competitive firm sets $p = MC + t$, but a monopolist sets $MR = MC + t$. The degree of tax shifting then depends on the relationship between demand and marginal revenue, as well as on elasticities.

What does this condition imply for tax shifting? Cases:

1. Suppose that elasticity of demand is constant. Then price is a constant markup (greater than zero) over marginal cost $c + t$. For $P(Q^*) > 0$ we must have $\epsilon^d > 1$ (monopolist operates on the elastic portion of the demand curve) so $1 - 1/\epsilon^d < 1$:
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   - Price rises by exactly one-half of the tax.

Quantitative incidence analysis

Quantitative incidence analysis estimates how tax burdens vary by income class – a full measure of *progressivity* of the tax system.

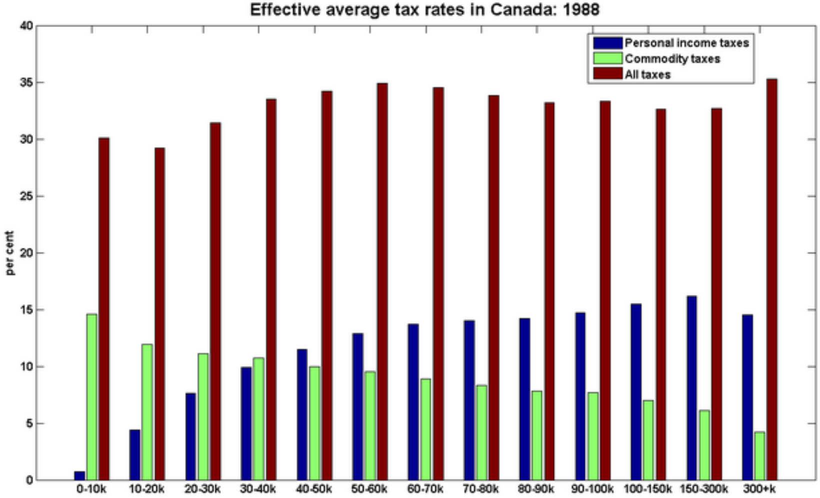
Standard approach uses:

- data on statutory tax rates on income, sales, property, etc.
- data on ownership of capital and labour, expenditure patterns by income group
- a theory of economic incidence of various taxes

Simulates effects on each income group of removing all taxes.

How progressive is the Canadian tax system overall?

Average tax rates by income group, Canada, 1988



Source: Vermaeten, Gillespie and Vermaeten (1994)