Undergraduate Public Finance: Tax Incidence

Germain Gauthier

Bocconi University

Tax Incidence

Tax incidence is the study of the effects of tax policies on prices and the economic welfare of individuals.

What happens to market prices when a tax is introduced or changed?

E.g., What happens when we impose a $ 1 per pack tax on cigarettes?

Well, it affects prices, with distributional effects on smokers, profits of producers, shareholders, farmers, etc.

We focus here on the positive analysis of taxation.

Tax Incidence

Tax incidence is not an accounting exercise but an analytical characterization of changes in economic equilibria when taxes are changed.

Three key points:

(1) The statutory burden of a tax does not describe who really bears the tax.

(2) The side of the market on which the tax is imposed is irrelevant to the distribution of the tax burdens.

(3) Parties with inelastic supply or demand bear taxes; Parties with elastic supply or demand avoid them.

Bottom line: In general, economic incidence ≠ legal incidence.

"One of the most valuable insights that economic analysis has provided in public finance is that the person who effectively **pays** *a tax is not necessarily the person upon whom the tax is levied.*
To determine the true **incidence** *of a tax or a public project is one of the most difficult, and most important, tasks of public economics."*

A. Atkinson and J. Stiglitz (1980)

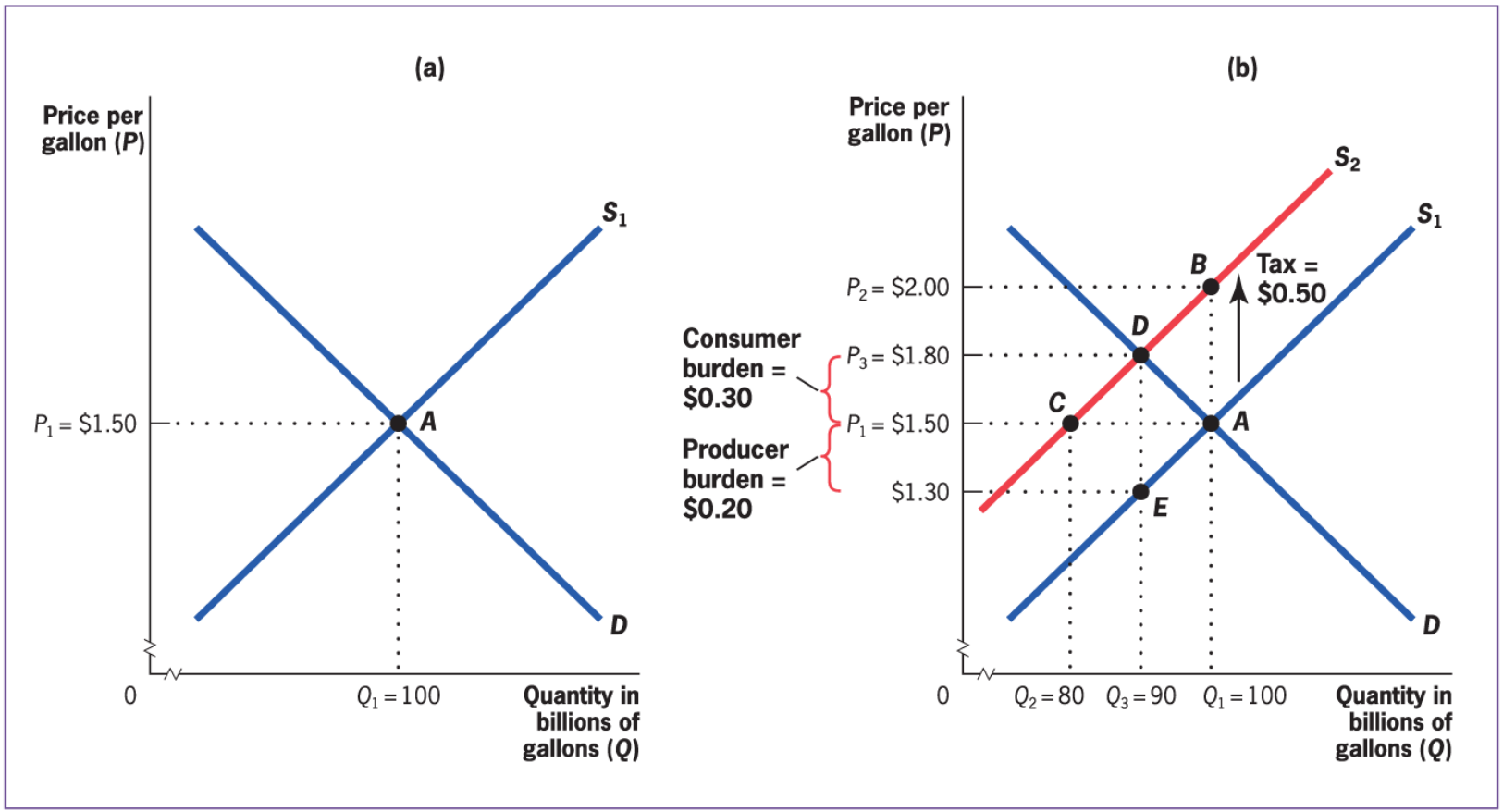
Partial Equilibrium Tax Incidence

Let's first consider the partial equilibrium model with a single good (illustrates well key mechanisms).

Government levies an excise tax on good.

Excise means it is levied on a quantity (gallon, pack, ton, ...) – typically fixed in nominal terms (*e.g, $ 1 per pack*).

Ad-valorem tax is based on a fraction of the price (*e.g., 5% sales tax*).



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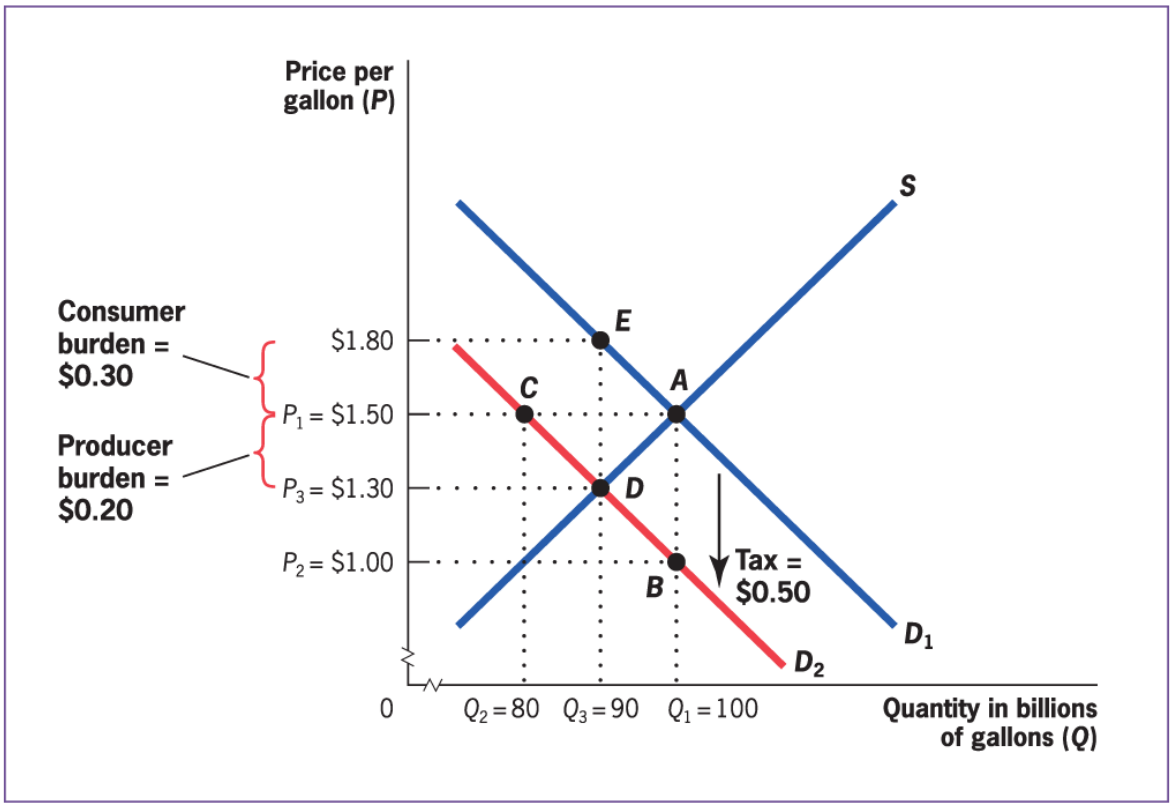

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Figure: The Side of the Market is Irrelevant.

When do consumers bear the entire burden of the tax?

(1) $\varepsilon_D = 0$ (inelastic demand)

E.g., short-run demand for gasoline inelastic (need to drive to work)

(2) $\varepsilon_S = \infty$ (perfectly elastic supply)

E.g., competitive industry with constant cost of production per unit

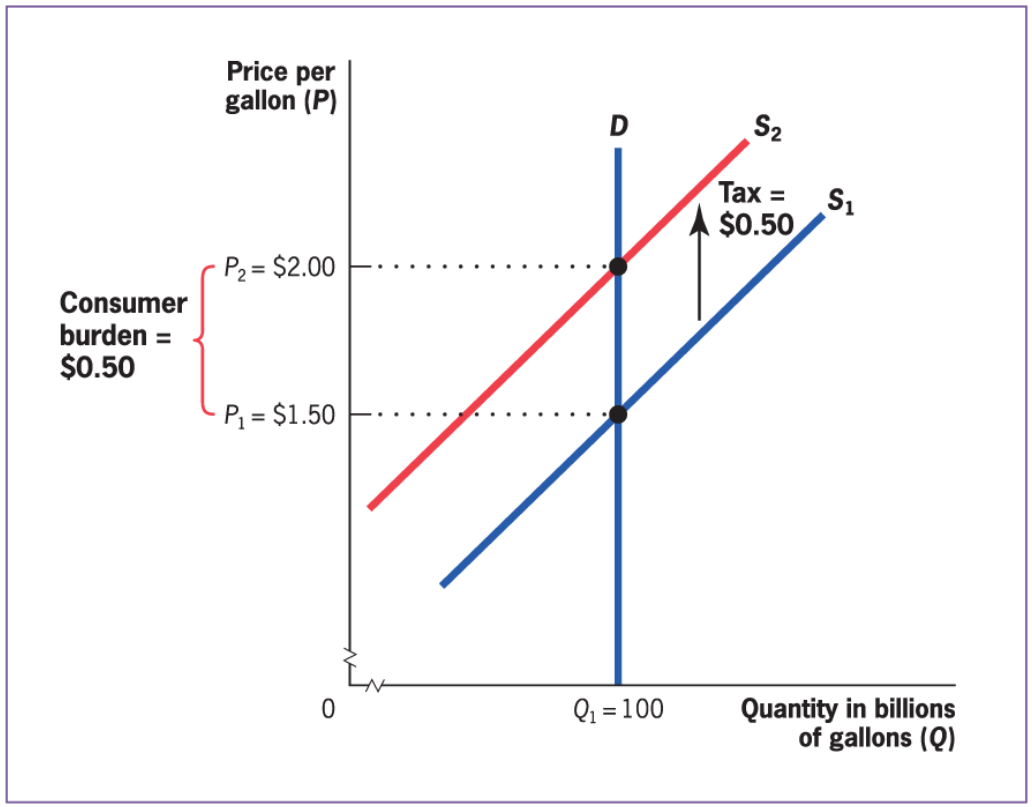

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Figure: Inelastic factors bear taxes.

When do producers bear the entire burden of the tax?

(1) $\varepsilon_S = 0$ (inelastic supply)

E.g., fixed quantity supplied (can only extract so much oil given oil wells)

(2) $\varepsilon_D = -\infty$ (perfectly elastic demand)

E.g., there is a close substitute, and demand shifts to this substitute if price changes

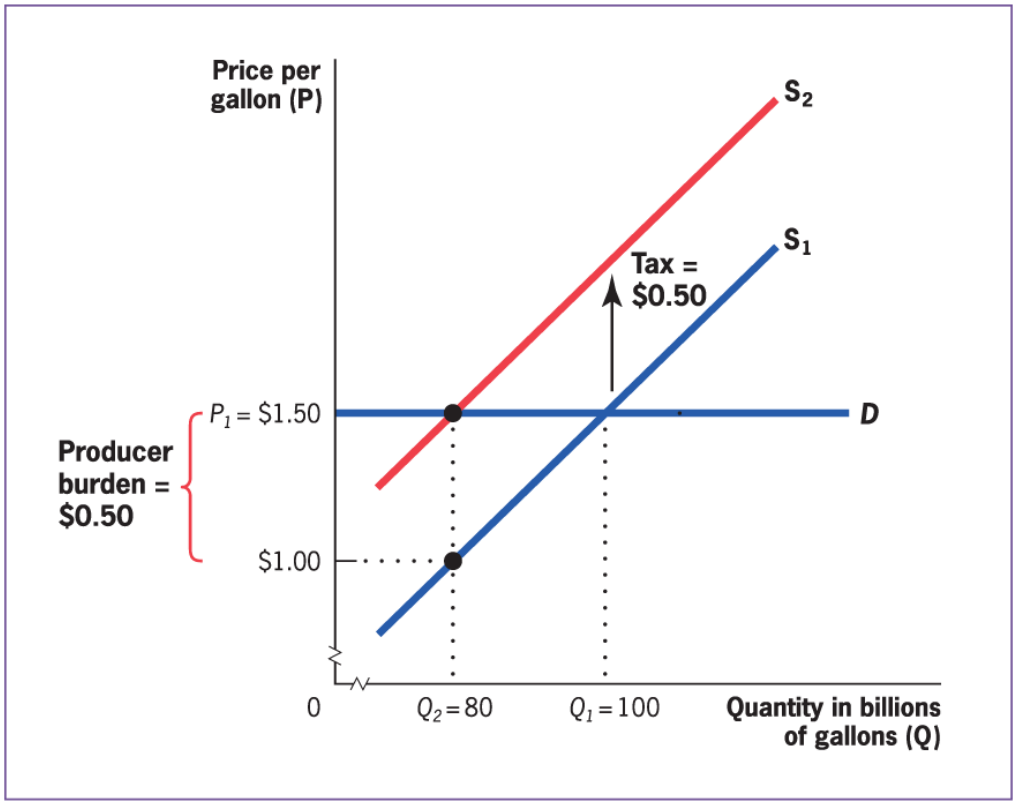

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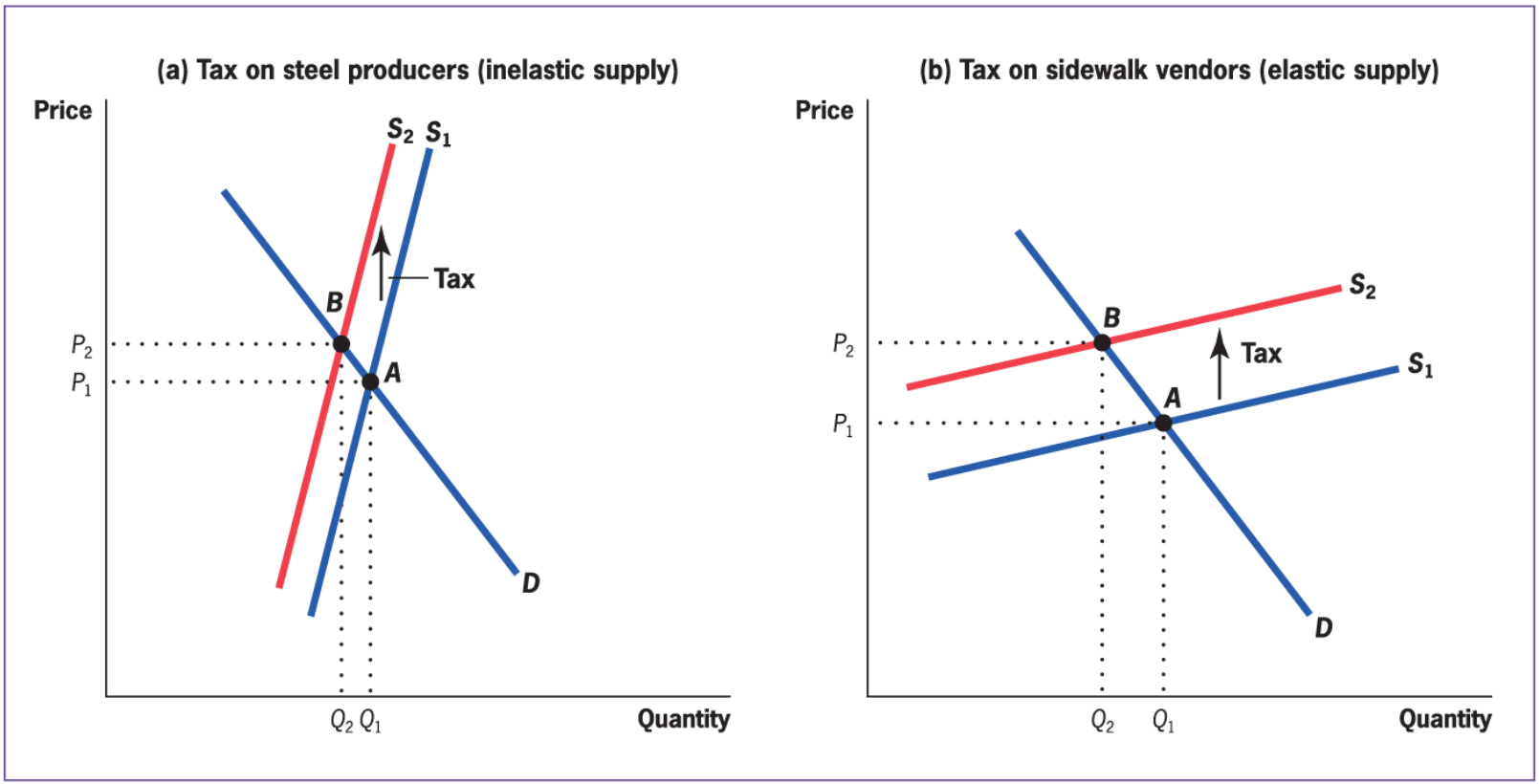
Figure: Inelastic factors bear taxes.



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Efficiency Costs of Taxation

Deadweight burden of taxation is defined as the welfare loss created by a tax over and above the tax revenue generated by the tax.

In the simple supply and demand diagram, welfare is measured by the sum of the consumer surplus and producer surplus.

The welfare loss of taxation is measured as a change in consumer+producer surplus minus tax collected.

It is also known as the **Harberger Triangle** (see textbook for the proof):

$$DWL = -\frac{1}{2} \times \frac{\varepsilon_S \varepsilon_D}{\varepsilon_S - \varepsilon_D} \times \tau^2 \times \frac{Q}{P}$$

Efficiency Costs of Taxation

(1) *DWB* increases with the absolute size of elasticities

⇒ More efficient to tax relatively inelastic goods.

(2) *DWB* increases with the square of the tax rate, so small taxes have relatively small efficiency costs, large taxes have relatively large efficiency costs.

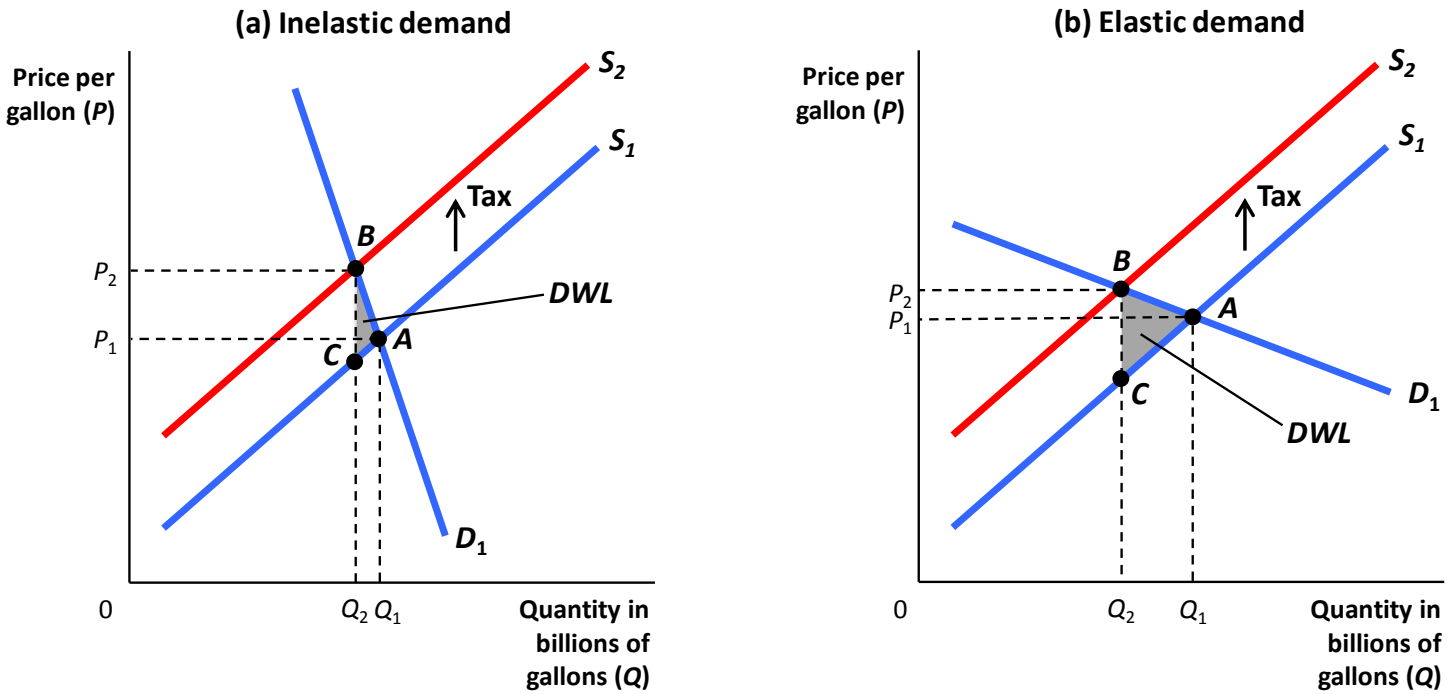
⇒ Better to spread taxes across all goods to keep each tax rate low

⇒ Better to fund large one time govt expense (such as a war) with debt and repay slowly afterwards than have very high taxes only during war.

(3) Pre-existing distortions (such as an existing tax) makes the cost of taxation higher.

20.1

Elasticities Determine Tax Inefficiency



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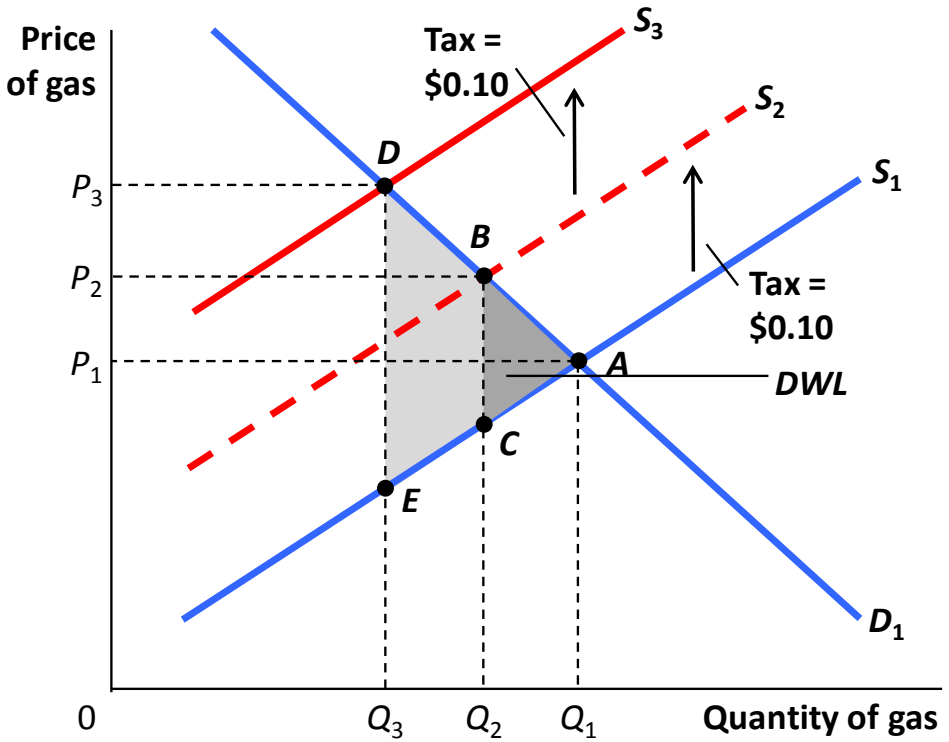
Marginal DWL Rises with Tax Rate



Empirical Application: Decreasing VAT Rates

E.U. directive allowing reduced VAT rates in labour intensive sectors

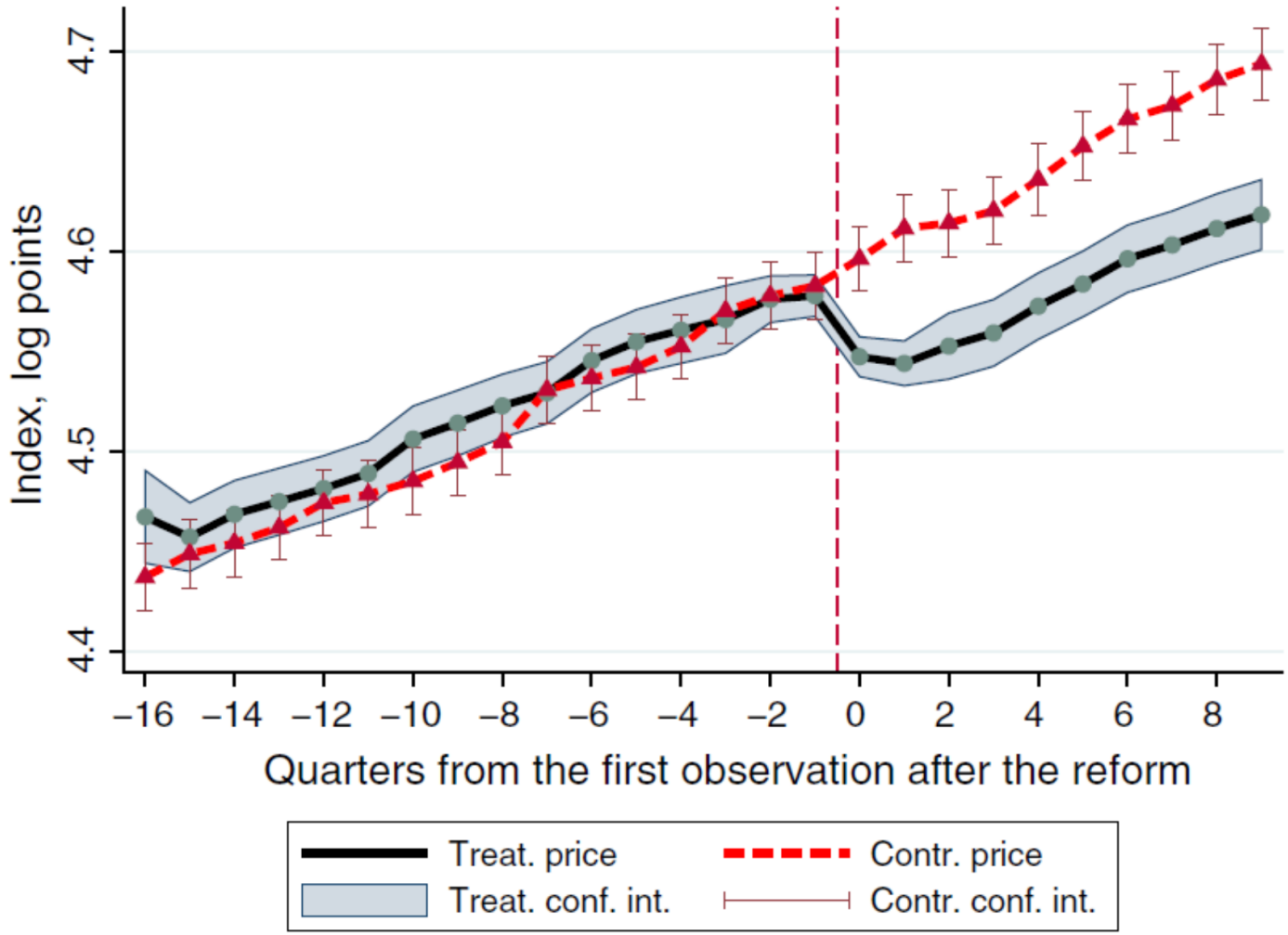
⇒ Aim to experiment whether reduced VAT rates can increase employment and reduce the shadow economy

2007: In Finland, cut in VAT rate on hairdressing services from 22% to 8% (-14 ppts)

Kosonen (2015) assesses the policy's effectiveness using a DiD comparing beauty salons and hairdressing.

⇒ Pass-through estimated around 50% (the consumer prices reduced by -5% to -6%)

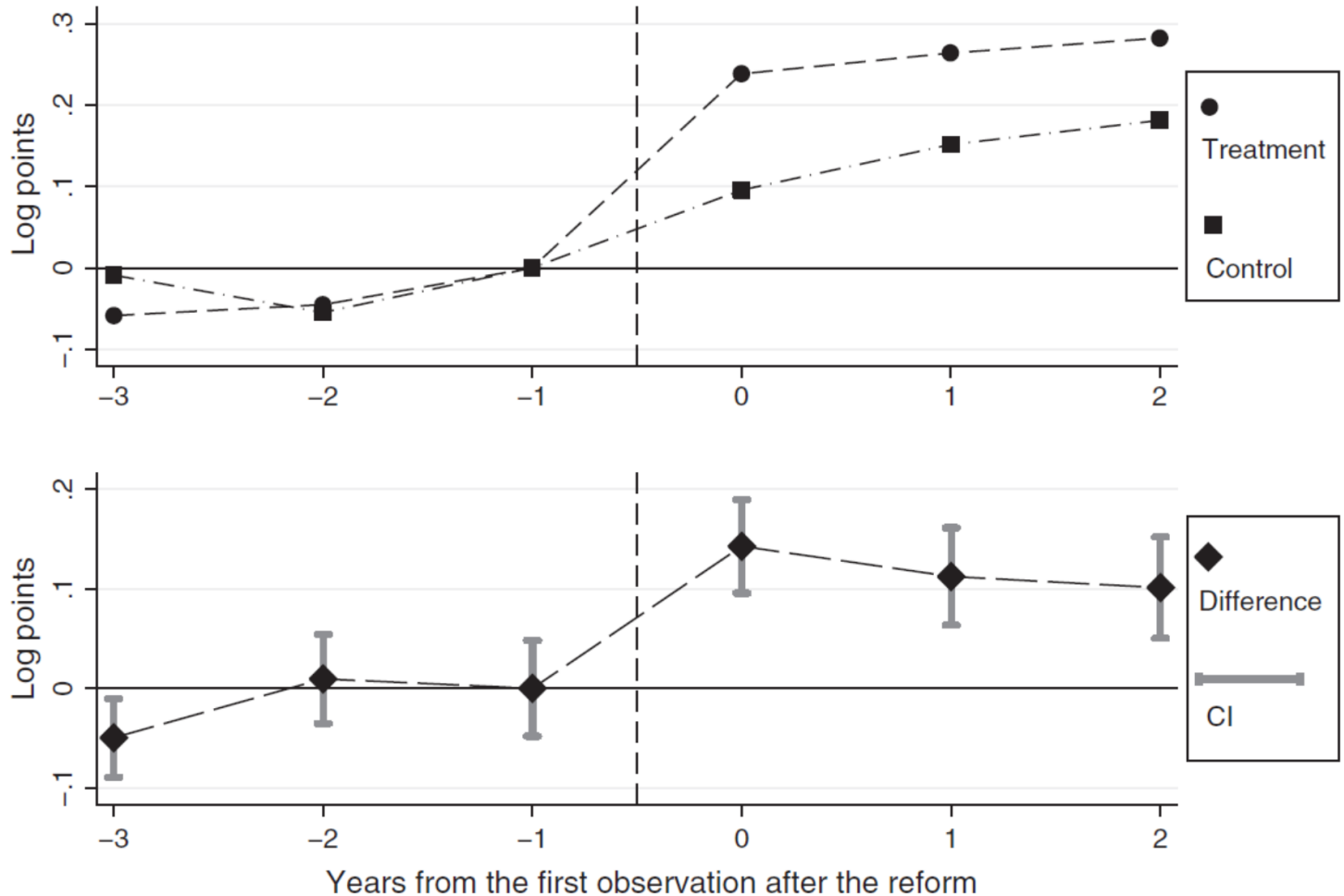
⇒ No effect on employment but a large increase in profits...



SOURCE : Kosonen (2015), Fig. 2, p. 92.

	(1) Net assets	(2) Log all costs	(3) Log wealth	(4) Log revenue	(5) Log wage sum
DiD	-6844	-0.021	0.022	0.056***	-0.080
	(4832)	(0.013)	(0.020)	(0.010)	(0.049)
After	1385	0.194***	0.019	-0.006	0.117***
	(1690)	(0.018)	(0.025)	(0.012)	(0.036)
N	99,136	96,962	90,408	95,67	7441
R2	0.000	0.035	0.005	0.455	0.095
N of firms	20,440	20,202	18,693	20,146	1163

SOURCE : Kosonen (2015), Tab. 7, p. 97.



SOURCE : Kosonen (2015), Fig. 7, p. 96.

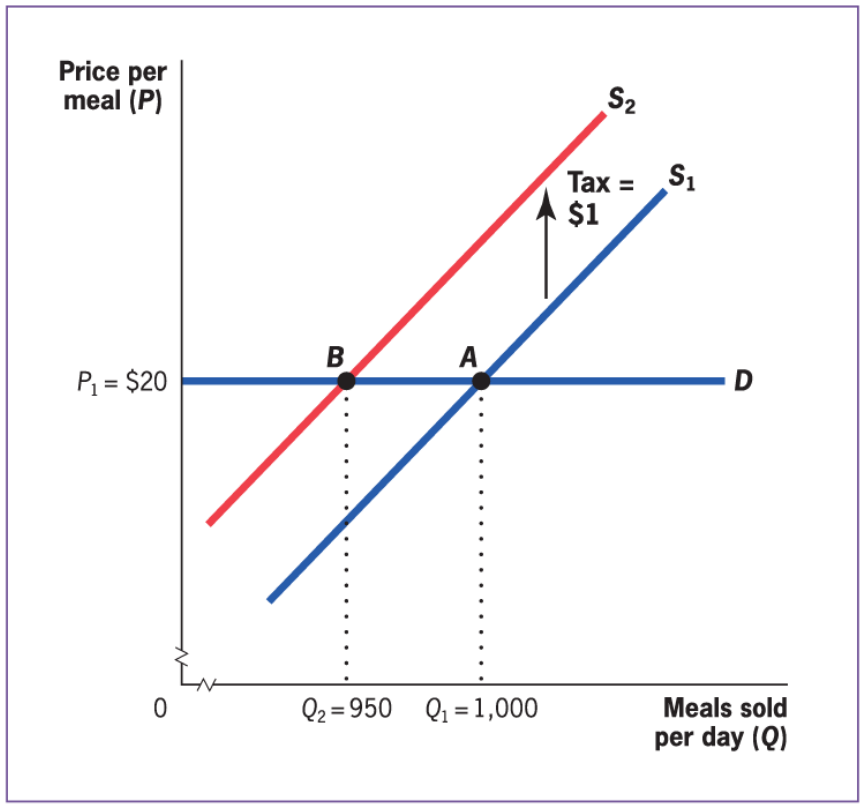
General Equilibrium Tax Incidence

Examples so far have focused on **partial equilibrium** incidence, which considers the impact of a tax on one market in isolation.

General equilibrium models consider the effects on related markets of a tax imposed on one market.

E.g., Imposition of a tax on cars may reduce demand for steel and generate additional effects on prices in equilibrium beyond the car market.

A Concrete Example: Effects of a Restaurant Tax



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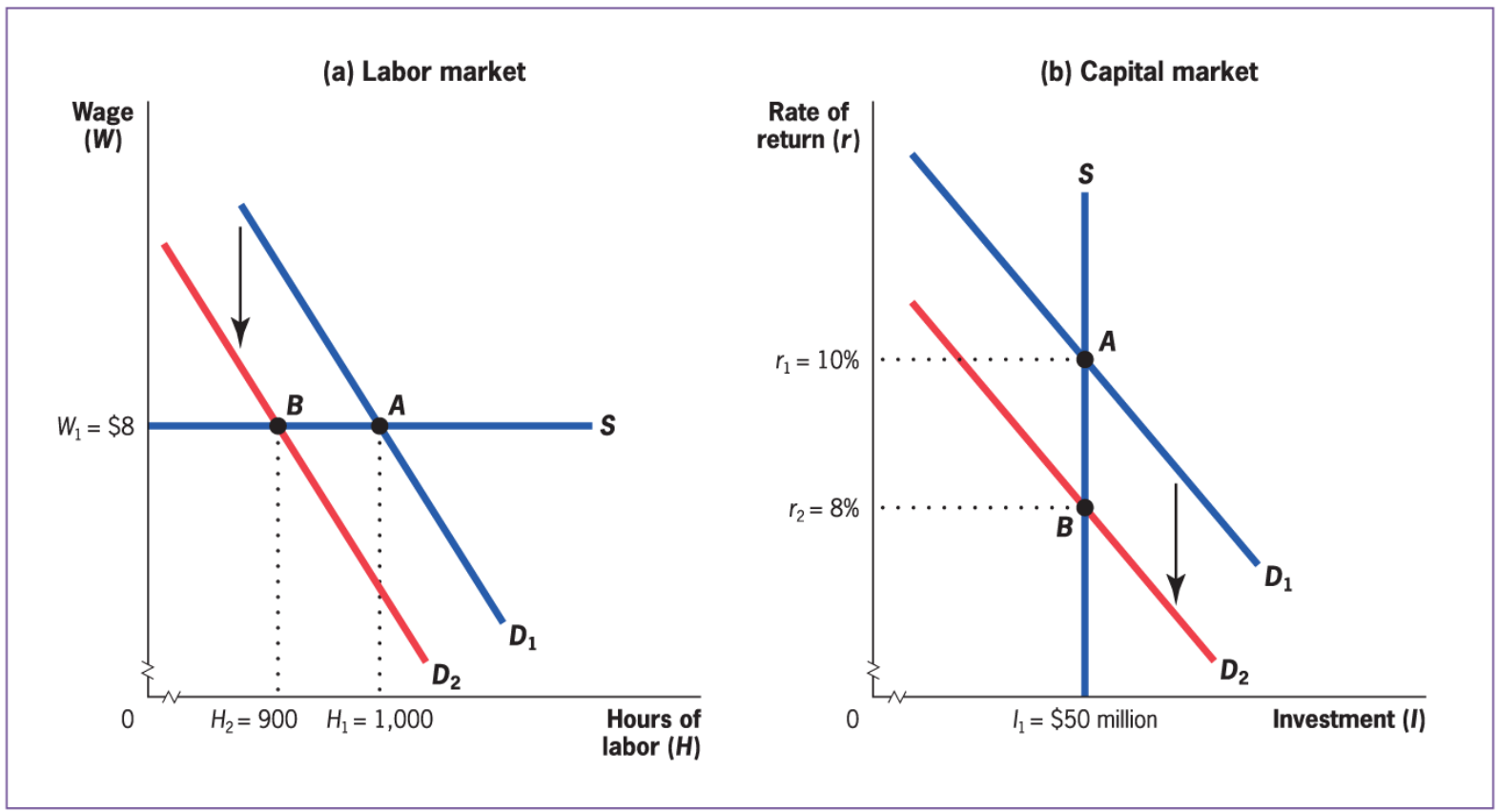
A Concrete Example: Effects of a Restaurant Tax



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A Concrete Example: Effects of a Restaurant Tax

The meal tax acts like an increase in the restaurant's marginal costs and shifts the supply curve inward.

Because demand is perfectly elastic, any increase in price to consumers would drive all business away.

Thus, the restaurant bears the entire burden of the tax, and consumers bear none of it.

More specifically, it is borne by the factors of production (labor and capital).

A Concrete Example: Effects of a Restaurant Tax

Labor supply is likely to be very elastic because workers can always choose another job or go to work in a restaurant in a nearby town.

When the new tax goes into effect and restaurants bear its full burden, they will reduce their demand for workers.

Each worker is worth less because the restaurant's willingness to pay for an hour of labor falls when it is taxed on the fruits of that labor.

The labor demand curve shifts downward, but because labor supply is perfectly elastic, wages do not fall, and workers bear none of this tax.

A Concrete Example: Effects of a Restaurant Tax

In the short run, having invested in a restaurant, the capital owner is stuck, unable to pull out money that has already been spent on stoves, tables, and a building.

Because the tax is borne fully by the restaurants, it reduces their demand for capital.

Capital is also worth less when the restaurant is taxed on the fruits of that capital, so the restaurant will demand capital only from those who are willing to charge a lower rate of return.

Because the supply of capital is inelastic in the short run, capital owners will bear the meals tax in the form of a lower return on their investment in the restaurant.

Factors that are inelastically demanded or supplied in both the short and the long run bear taxes in the long run.

Investments are irreversible, so the supply of capital is inelastic in the short run.

But investors have many opportunities, and, in the long run, the elasticity of capital may be high.

Jonathan Gruber, Public Finance and Public Policy, Fifth Edition, 2019 Worth Publishers, Chapter 19

Kosonen, T. (2015). More and cheaper haircuts after VAT cut? On the efficiency and incidence of service sector consumption taxes. Journal of Public Economics, 131, 87-100. (web)