

# **The economic cost of public funds in infrastructure investment**

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# Key insight

Cost of 1€ of public funds = 1€ + *something*



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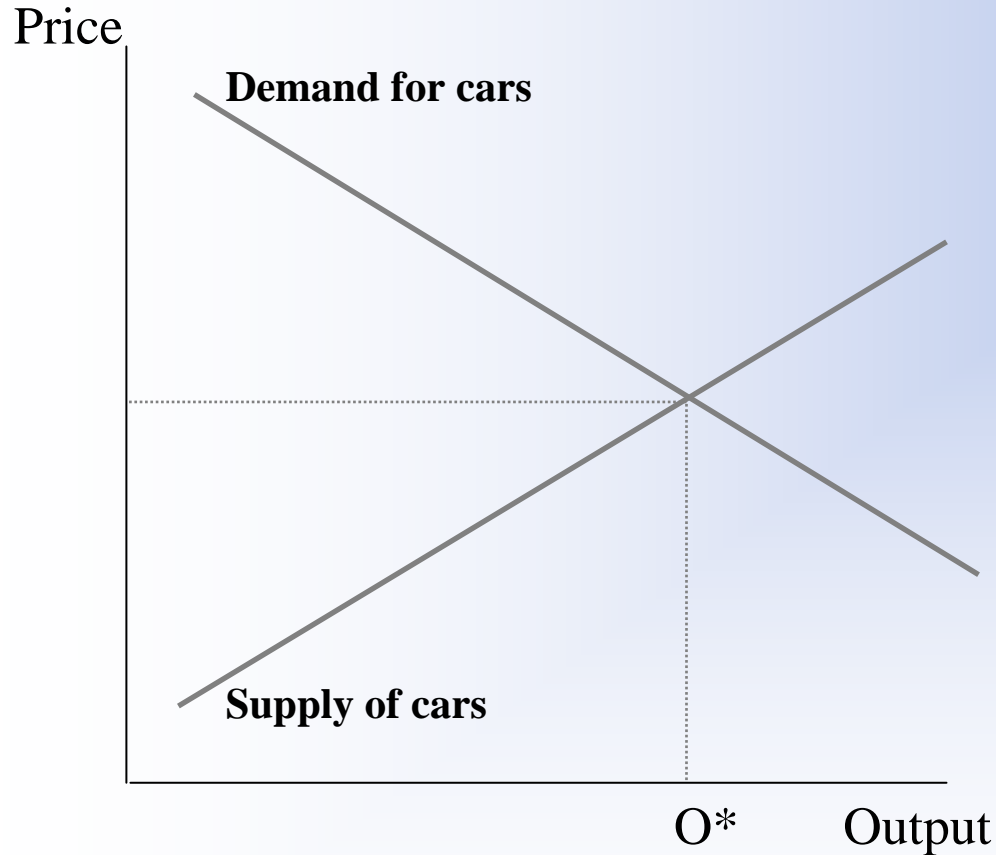
Excess burden of taxation

# Outline

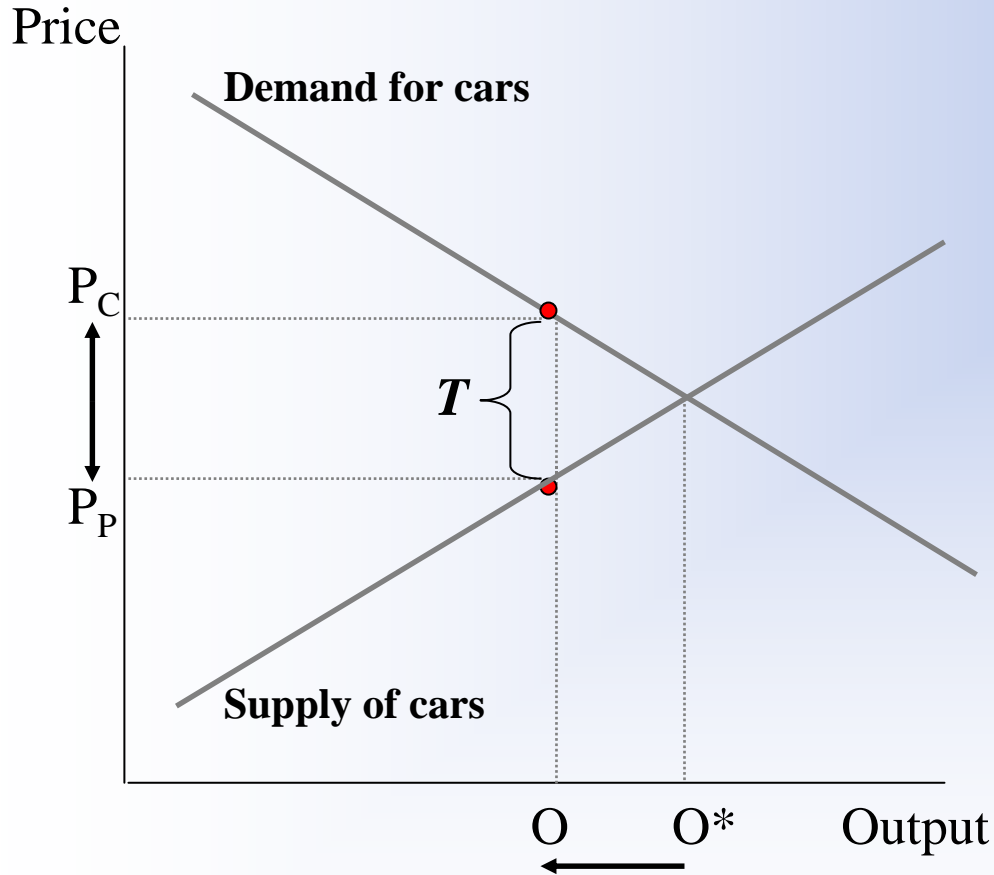
## Economic cost of public funds (CoF):

- (1) What is it? (explaining the “**1 + something**”)
- (2) How big is it? (estimates of the “**1 + something**”)
- (3) What does it imply for investment appraisal?
- (4) Why it should not be confused with
  - (i) Discount rate!
  - (ii) Interest rate on government debt!

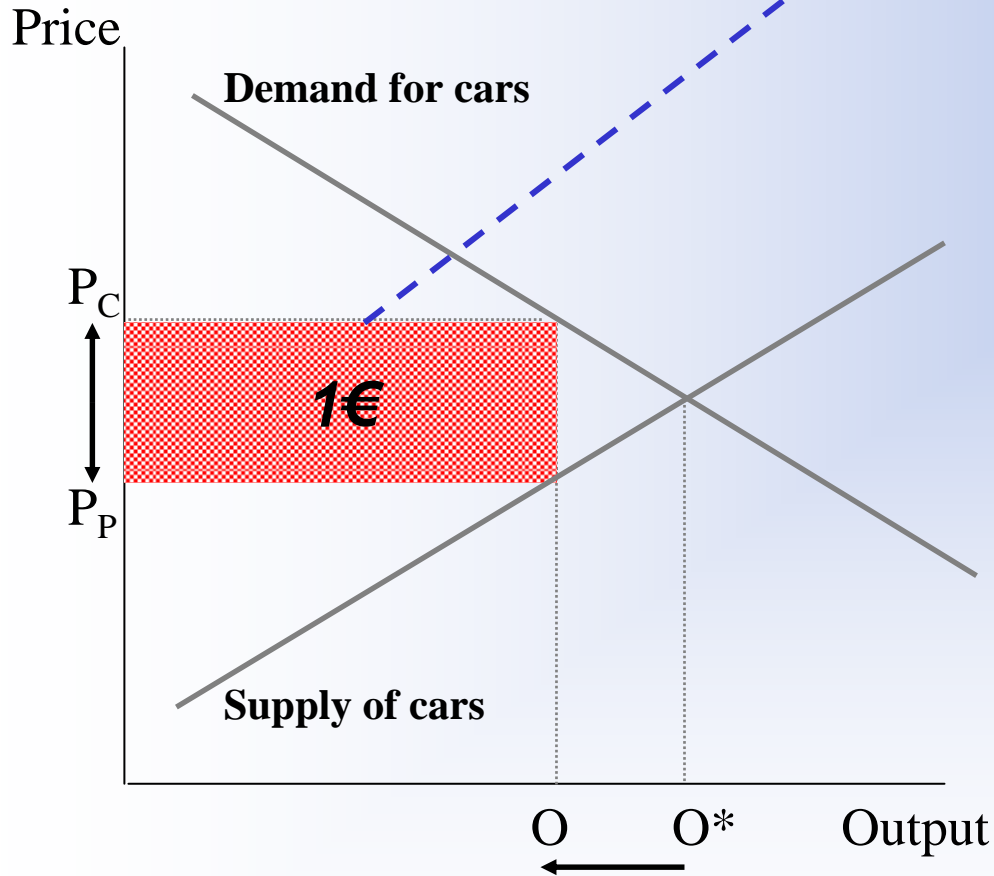
# Explaining CoF: *1 + something*



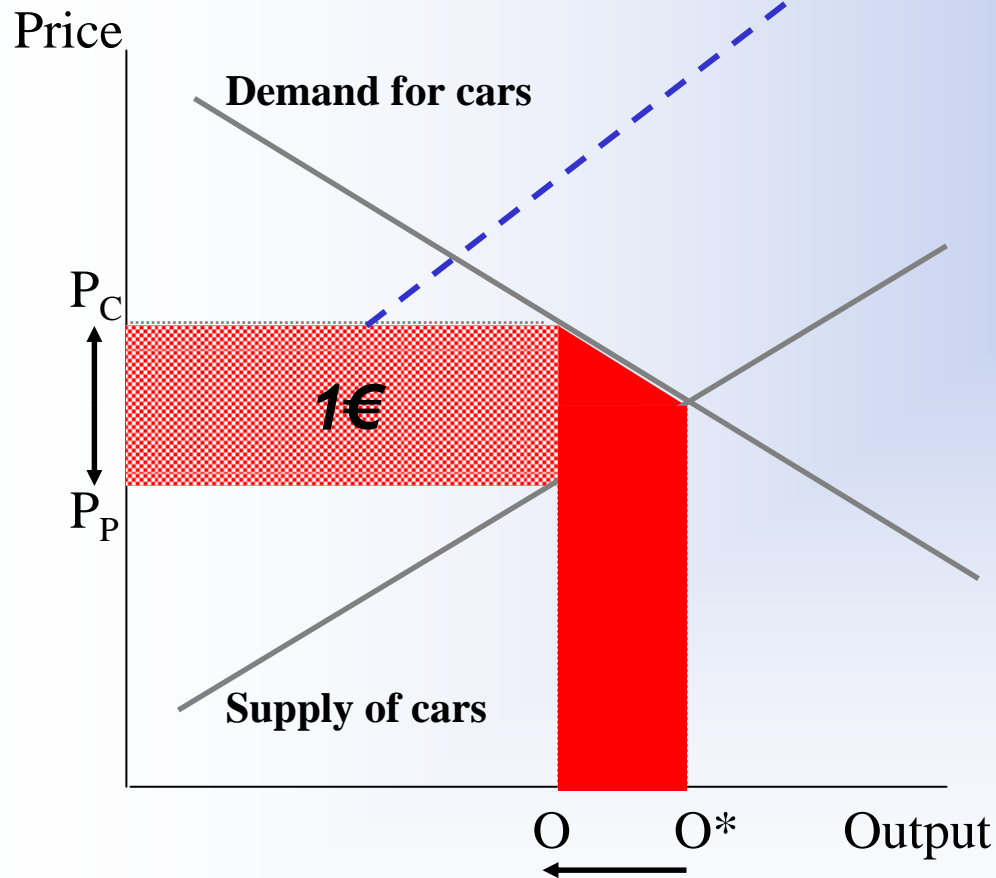
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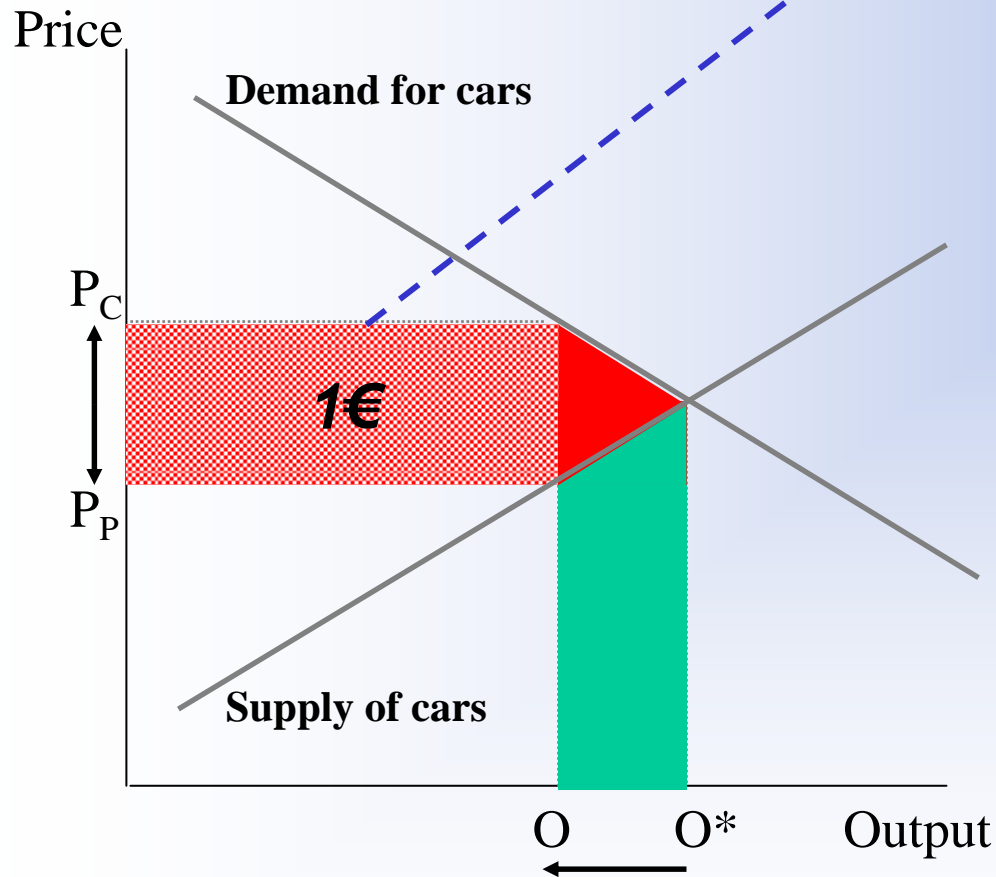
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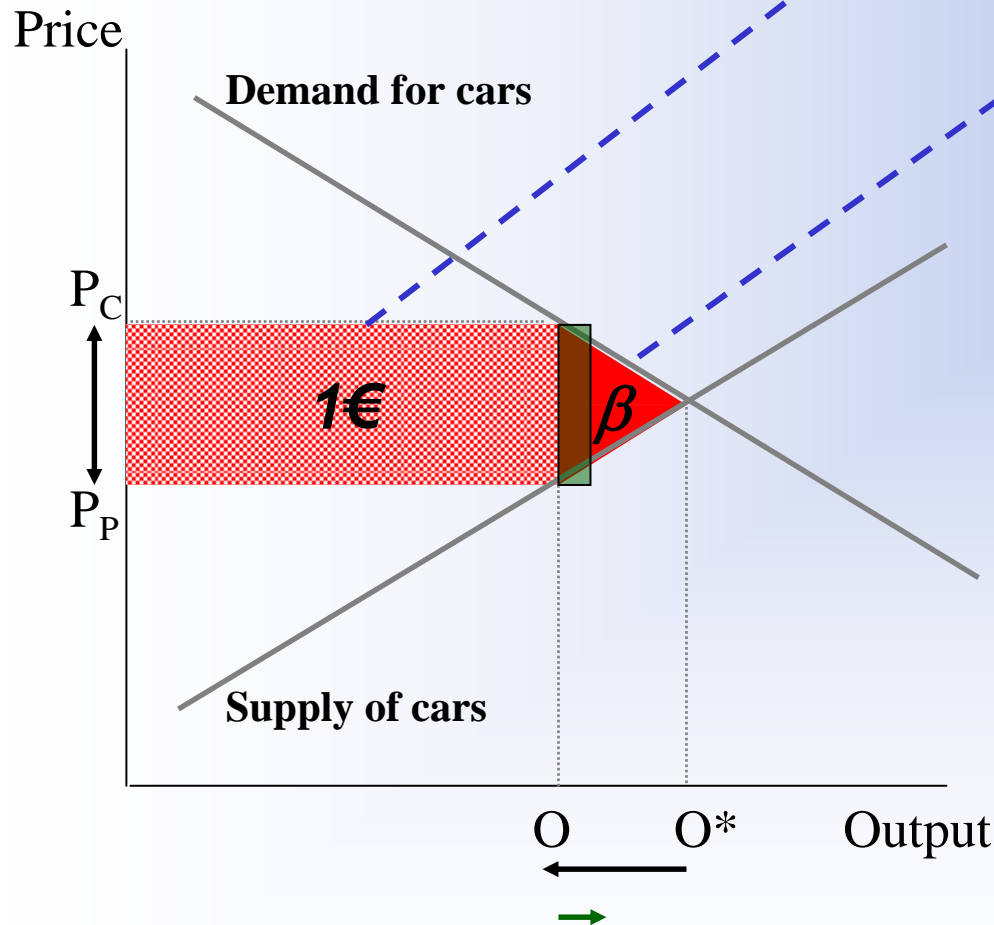
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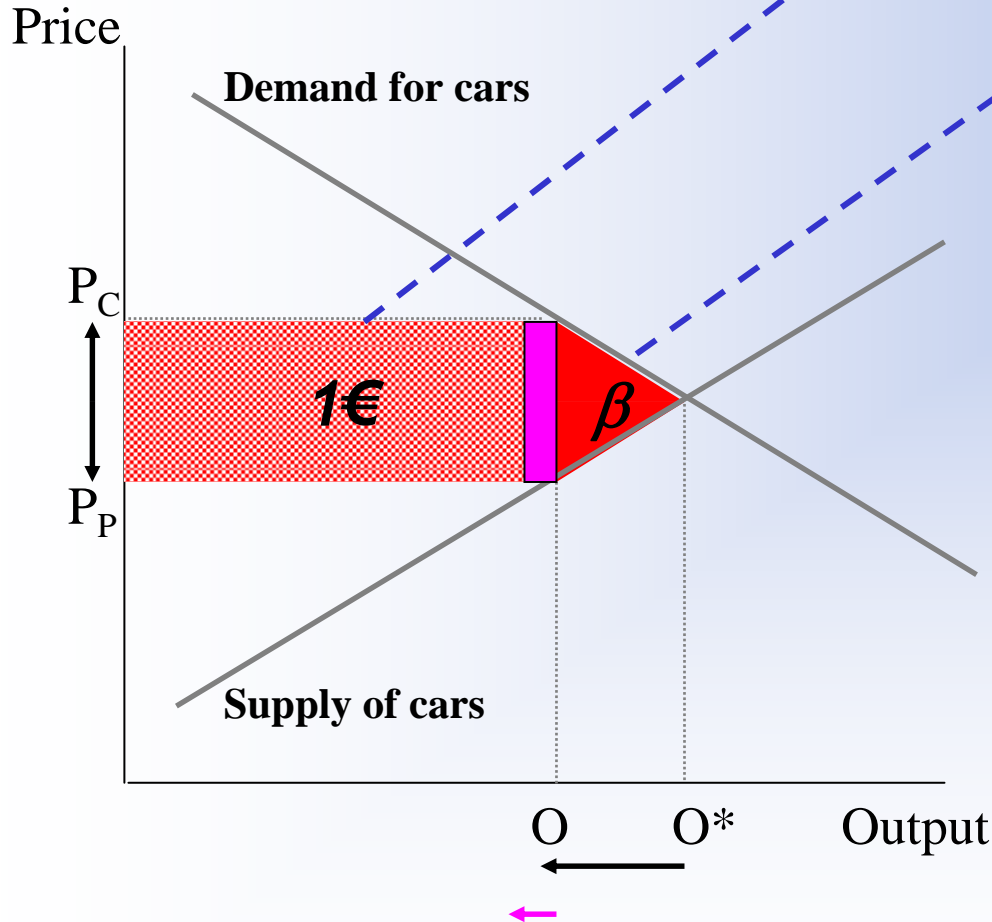
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$\beta$ : Excess burden of taxation  
*Pigou (1947)*

Spending effect of taxation  
*Diamond & Mirrlees (1971)*  
*Stiglitz & Dasgupta (1971)*

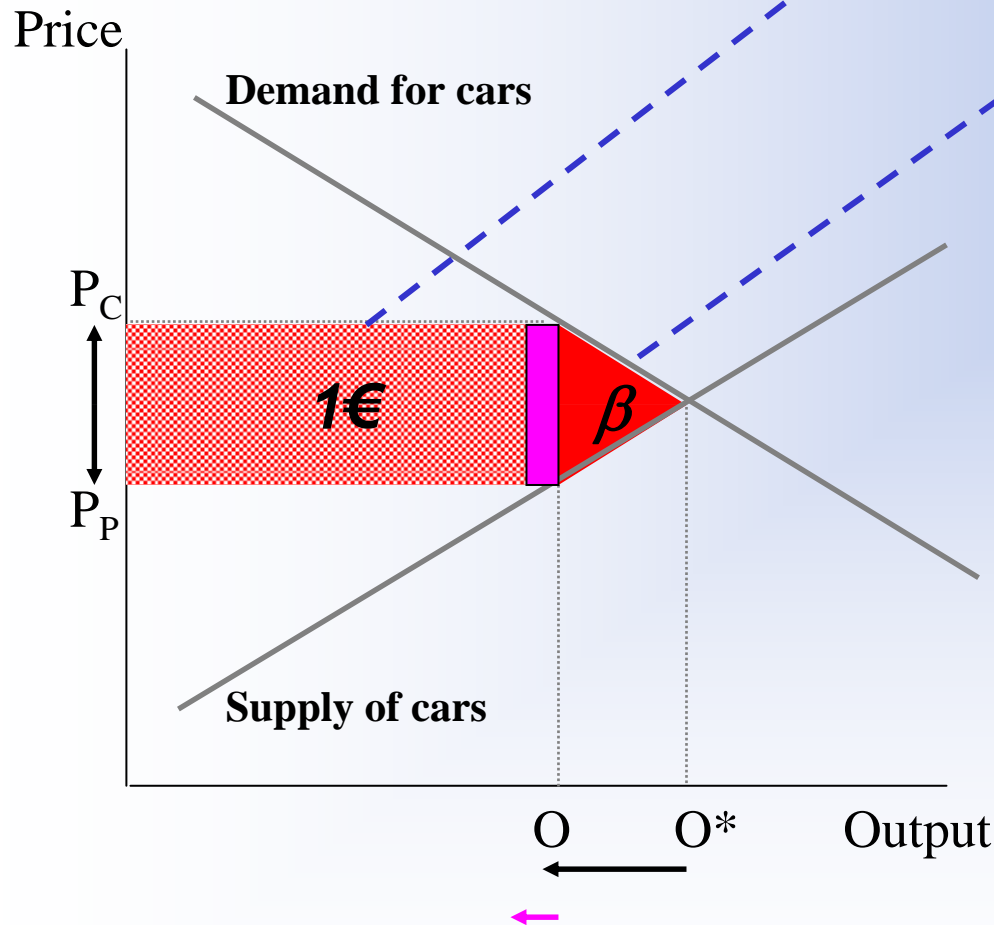
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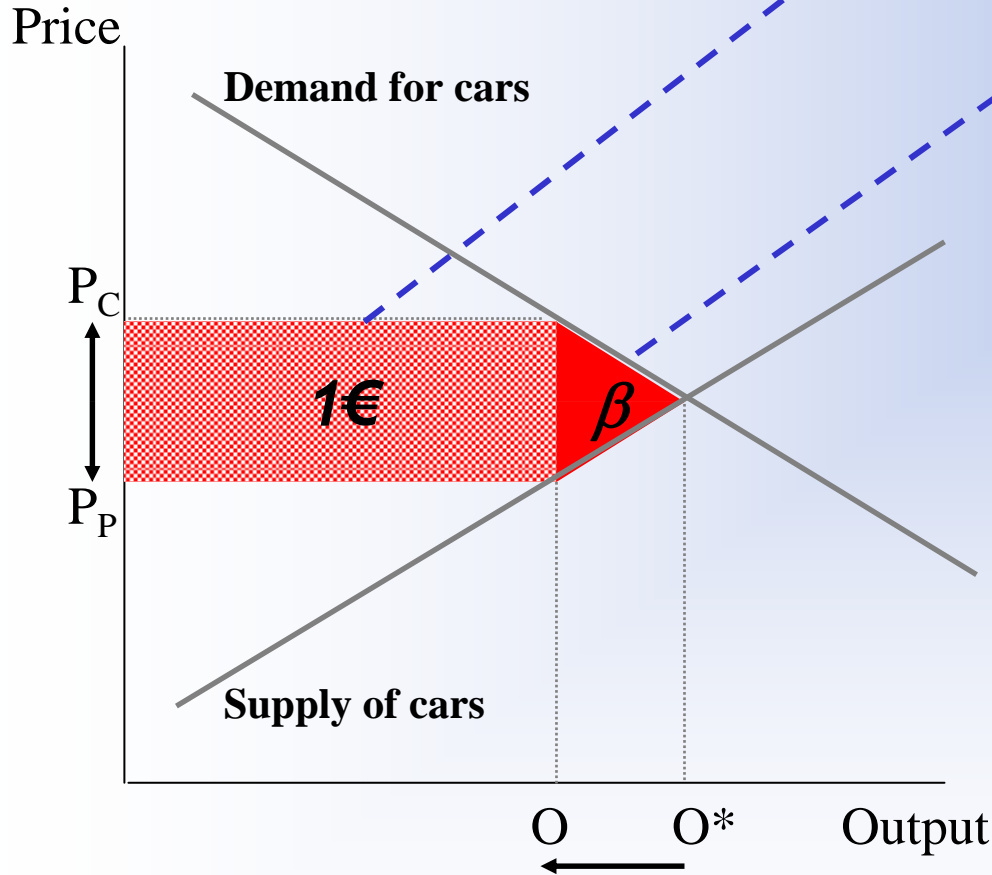
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# Explaining CoF: $1$ + *something*



## Summary

- $\text{CoF} = 1 + \beta$
- $1 = \text{opportunity cost}$   
(burden of taxation)
- $\beta = \text{excess burden of taxation}$
- Other taxes, notably *wage tax*

# Estimates of $1 + \beta$

- *wage tax* -

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Study	Country	Estimate
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*Sources: Jones (2005) and Kleven & Kreiner (2006)*



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- *wage tax* -

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Browning (1976, 1987)	United States	$\approx 1.3\text{--}1.5$
Diewert & Lawrence (1996)	New Zealand	$\approx 1.2$
Campbell & Bond (1997)	Australia	$\approx 1.2$

*Sources: Jones (2005) and Kleven & Kreiner (2006)*



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Kleven & Kreiner (2006)	EU-15	
	<i>Spain, UK</i>	$\approx 1.2$
	<i>GER, FR, AT</i>	$\approx 1.6\text{--}1.9$
	<i>BEL, DK, FIN</i>	$\approx 2.2$

Sources: Jones (2005) and Kleven & Kreiner (2006)



# Cost of funds & investment appraisal

**Standard cost-benefit (CB) rule:**

$$B = C$$

**Modified CB-rule:**

$$B = (1+\beta) C$$

**Modified CB-rule with user fees:**

$$B = [1+\beta(1-\lambda)]C$$

$\lambda =$  **cost recovery ratio;**  $0 \leq \lambda \leq 1$

$\lambda = 0 \rightarrow$  **no cost recovery**

$$B = [1+\beta]C$$

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$1+\beta$	$\lambda$	Cost	Required Benefits
		100	
		100	
		100	

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1.2	0.0	100	120
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# CoF, discount rates & interest rates

2-period model; no cost recovery

First period (t=1):

Costs

Second period (t=2):

Costs & Benefits

Social discount rate:  $d$

$$\frac{B_2}{1+d} = (1+\beta)C_1 + \frac{(1+\beta)C_2}{1+d}$$

Cost of public funds  $\neq$  discount rate

- **CoF: cost of transferring funds from private sector to government at any point in time**
- **Discounting: weighing exercise to compare costs & benefits occurring at different points in time**

Cost of public funds  $\neq$  interest rate ( $r$ ) on government debt

- **Interest rate reflects cost to government, not to society**

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# Conclusion

**CoF > 1** too important to ignore in CBA  
**⇒ B > C!**

**User fees mitigate excess burden (CoF >1), but do not eliminate it.**

**Borrowing means taxing later (rather than now), deferring but not avoiding the excess burden.**

**CoF must not be confused with**

- **Discount rate**
- **Interest rate on government debt.**