

Economia, Finanza e Analisi dei Dati

Laurea Magistrale

Data Analysis for Economics

Topic 2: Fuel Prices and Taxes

Marco Nieddu

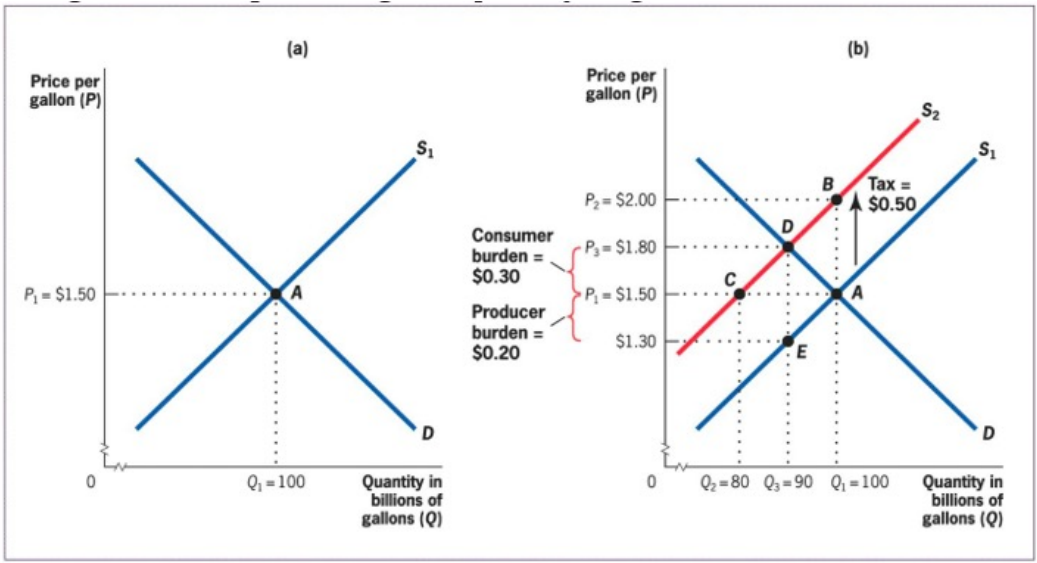
Fall 2026

What Is in a Litre of Fuel?

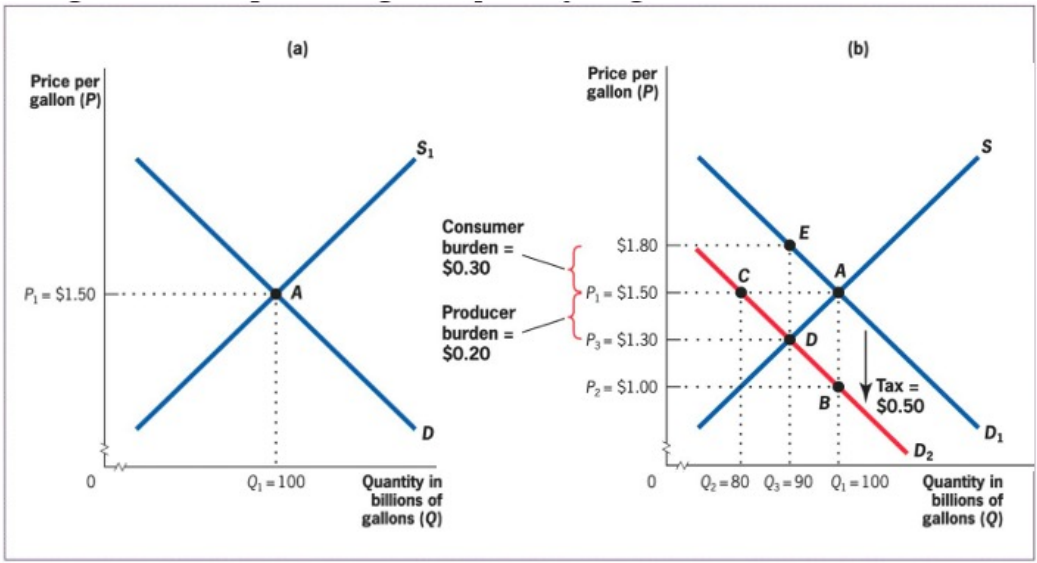
- Part of the pump price pays for the fuel, the refinery and the station; the rest goes to the state:
  - the **excise**: a fixed amount per litre;
  - the **VAT**: 22% of the net price plus the excise.
- In March 2022, with prices at record highs, the Italian government cut the excise on petrol and diesel by 25 cents per litre (30.5 cents with the VAT).
- **Did pump prices fall by as much?** Who got the money the state gave up: drivers, or the oil companies and the stations?

Theoretical Framework: Tax Incidence

- How (equilibrium) prices respond to taxes is a longstanding question in Public Economics, with distributional implications.
- **Tax incidence**: who ultimately bears the economic burden of the tax?
  - 'Naive' answer: those who pay the tax to the government (*statutory incidence*). The excise is paid by the oil companies.
  - But *statutory incidence* $\neq$ *economic incidence*.
- The burden may fall on consumers, producers, or both, regardless of who pays it. What matters is the elasticity of demand and supply: the less elastic side bears more of it.



Gruber, *Public Finance and Public Policy*, 6e, © 2019 Worth Publishers



Gruber, *Public Finance and Public Policy*, 6e, © 2019 Worth Publishers

A More Realistic Perspective

- The standard model relies on several assumptions, such as:
  - perfect competition,
  - perfectly rational agents (complete and symmetric information/attention).
- Fuel demand is rigid: with perfect competition, a tax cut should go (almost) entirely to consumers. Does it?
- We have reasons to believe that these assumptions are often not satisfied.
- For example, standard theory suggests that tax cuts and hikes should have symmetric effects on prices.
- And with market power, firms can keep part of a tax cut: competition should matter.

What Goes Up May Not Come Down

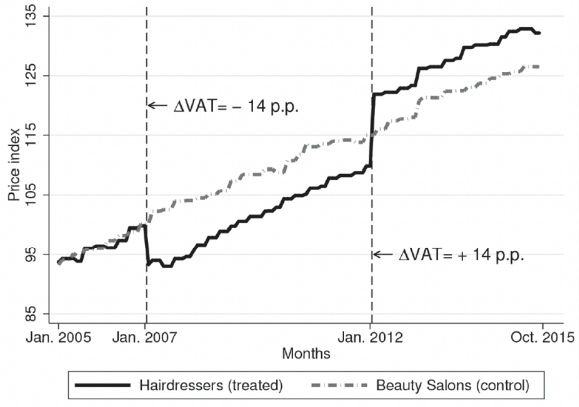


FIG. 1.—Finnish hairdressing sector VAT reforms. This figure shows the price of hairdressing services and beauty salons before and after the 14 percentage point hairdressing services VAT cut in January 2007 and the 14 percentage point VAT hairdressing services hike in January 2012.

A (very short) literature

- Gruber, J. (2022). *Public Finance and Public Policy*. Worth Publishers.
- Benzarti, Y., Carloni, D., Harju, J., & Kosonen, T. (2020). What goes up may not come down: asymmetric incidence of value-added taxes. *Journal of Political Economy*, 128(12), 4438–4474.
- Kilian, L., & Zhou, X. (2024). Heterogeneity in the pass-through from oil to gasoline prices: A new instrument for estimating the price elasticity of gasoline demand. *Journal of Public Economics*, 232, 105099.
- Harju, J., Kosonen, T., Laukkanen, M., & Palanne, K. (2022). The heterogeneous incidence of fuel carbon taxes: Evidence from station-level data. *Journal of Environmental Economics and Management*, 112, 102607.
- Genakos, C., & Pagliero, M. (2022). Competition and pass-through: Evidence from isolated markets. *American Economic Journal: Applied Economics*, 14(4), 35–57.

This Topic

	Question	**Data**
1. Prices	Incidence analysis of tax cuts & increases	National weekly prices by component, 2005–2026; Brent crude oil
2. Revenues	Who pockets the tax changes?	Prices + monthly fuel sales
3. Competition	Do stations with more competitors pass on more?	Daily prices of every station

In class/homework: replicate the same analysis for the 2026 excise changes.

Institutional Details

- The excise changes rarely, by steps.
- 14 March 2022: cut announced. 28 March 2022: -25 cents per litre on petrol and diesel. December 2022 and January 2023: back, in two steps.
- In 2026, new changes: a realignment of petrol and diesel in January, a new cut in March.
- Heating oil comes from the same refineries and the same crude oil, but its excise never changed: a candidate **control**.

Part 1: Prices

1. **What is in a litre**: pump price = net price + excise + VAT; the share of taxes over time.
2. **Looking for controls**: crude oil and heating oil.
3. **The retail margin**: net price of diesel − net price of heating oil.
4. **Seasonality**: to account for seasonality, we can compare each week with the same week of 2018–2019.

Part 2: Quantities

1. **Excise revenue (State)**: litres sold $\times$ excise, month by month. What is each change worth?
2. **Do sales move?** Prices and quantities: is demand inelastic?
3. **Firm revenues**: the retailers' margin before and after each change.
4. **Who gains/loses from the 2022 cut?** The state and the sellers.

Part 3: Competition

- Parts 1 and 2 use national averages. But the market is local: a station competes with the stations nearby.
- Theory: in competitive markets prices are close to costs, and a tax change is passed on; with market power, firms can keep part of it.
- Genakos and Pagliero (2022), Greek islands: pass-through about 0.4 with one station, about 1 with four or more.
- We use the daily price of every Italian station (MIMIT), with its location: do stations with more competitors pass on more of the excise changes?

Data Sources

- Weekly prices by component, Ministry of the Environment and Energy Security (SISEN), open data, IODL 2.0: https://sisen.mase.gov.it/dgsaie/open-data
- Fuel sales by month: MASE, *Consumi petroliferi*.
- Brent crude oil (`DCOILBRENTEU`) and the dollar-euro exchange rate (`DEXUSEU`): FRED, Federal Reserve Bank of St. Louis, https://fred.stlouisfed.org/
- Daily prices of every station: MIMIT, carburanti-archivio-prezzi: one file for prices (*prezzi*), one for the stations (*anagrafica*).