

A MODEL TO ESTIMATE THE EFFECT OF OIL PRICE ON RENEWABLE ENERGY CONSUMPTION, CASE STUDY: EUROPE

Amirhossein Fattahi, Matteo Mazzarano

Graduate students in M.A. in Resource Economics and Sustainable Development,
University of Bologna, Italy.



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- Overview
- Methodology
- Results
- Discussion: neutrality?

ENERGY MARKET

- Use aggregation: transport, industry, households
- Type aggregation: electric, heating, fuels

ENERGY MARKET

- Renewables vs Oil-Related/Oil-Affected
- Brent affects prices of non-renewable primary

ENERGY MARKET

- Brent is a factor of production

THE RELATION

- $Y_{tot} = Y_r + Y_{nr}$
- Oil as production factor : $Y_r = f(p_{brent})$
- $\partial Y_r = -\partial Y_{nr} \xrightarrow{\text{yields}} \partial Y_r = -f(p_{brent})$

THE RELATION

- Is energy a normal good?
- Yes → Price discrimination

BASIC MODEL

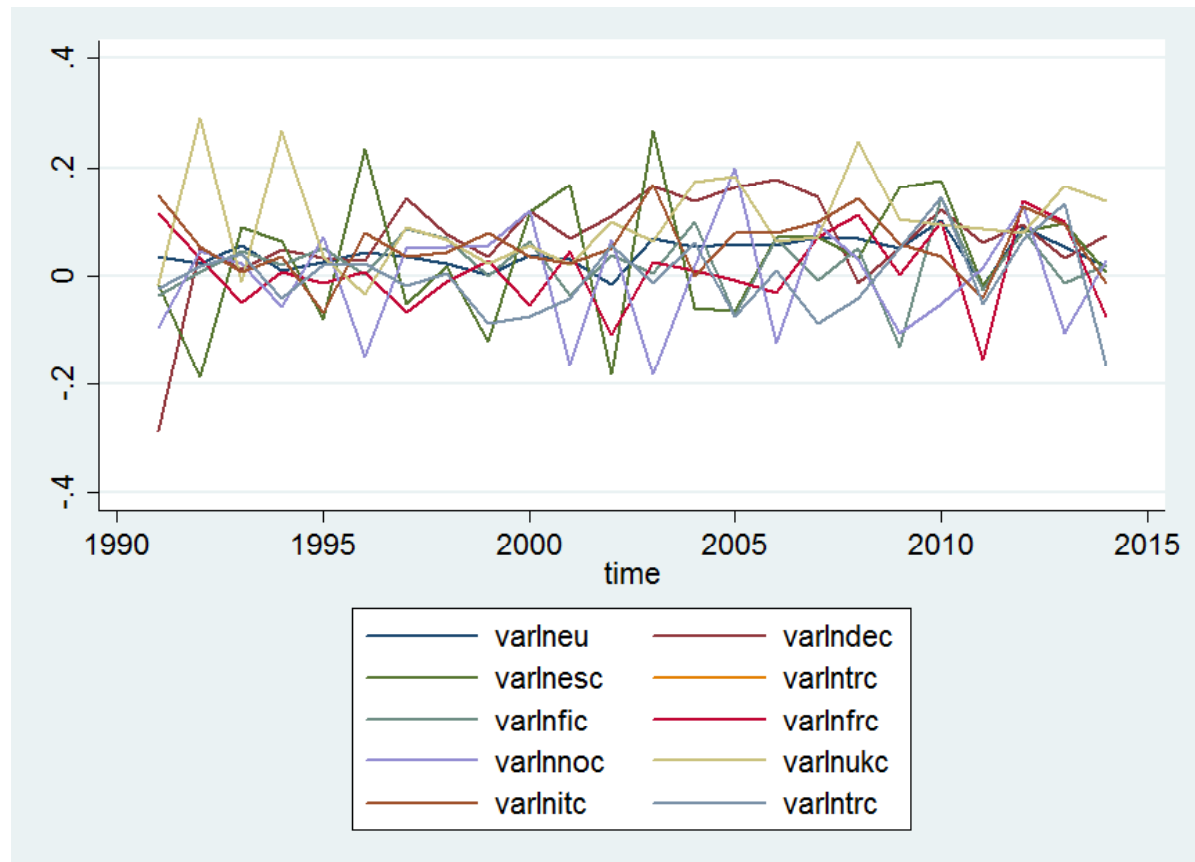
- Data (TOE, Brent)
- The first-step Model
 - $C_i = \beta_i \times L_j \cdot OP + Const. + \varepsilon_i$

BASIC MODEL

- Problems
 - Stationarity
 - Autocorrelation
- Different weight of population: TOE per capita

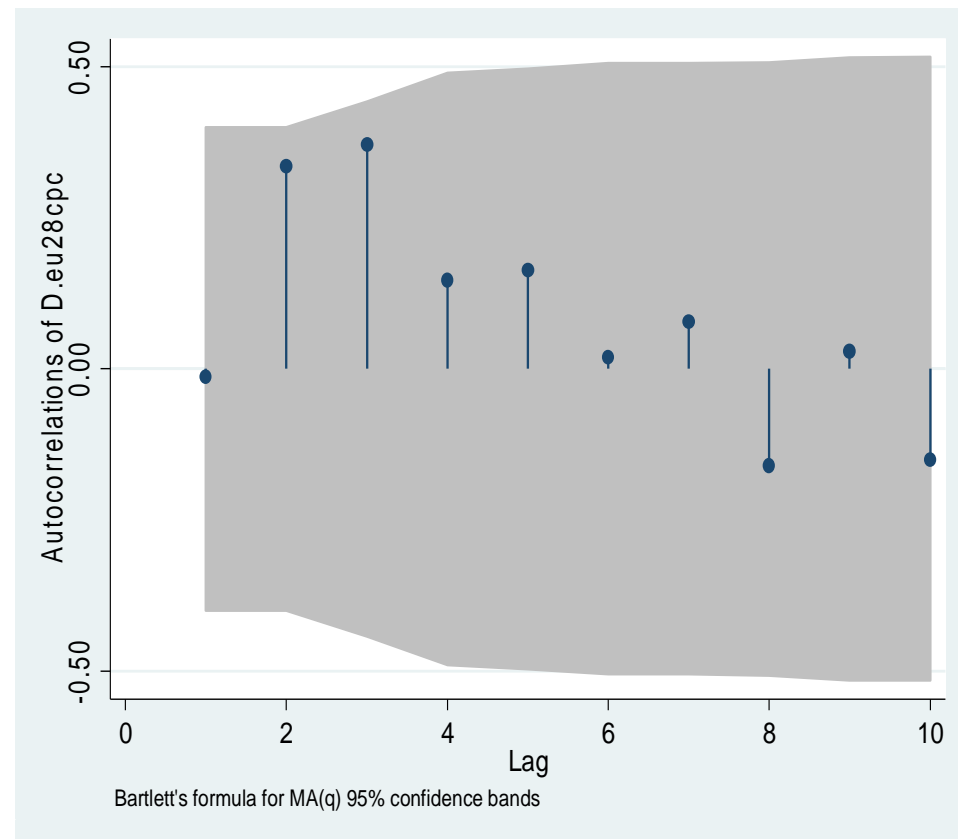
STATIONARITY

- Stationarity Data
- Stationarization
- *Dickey–Fuller* test
- $\Delta \ln X \cong \Delta X / X_0$



AUTOCORRELATION

- Correlogram
- Interpretations



FINAL MODEL

- Normalized Data
- The last-step Model
 - $\Delta \ln CPC_{i,t} = \sum_{\tau=0}^5 \beta_{i,t-\tau} \Delta \ln OP_{i,t-\tau} + \varepsilon_{i,t}$
- Skewness and kurtosis test
- No constant constraint: worse models, constant variations?

ELASTICITY

- Significant β
- Semi-quantitative approach for lags
- Interpretations
- Neutrality and Hedge

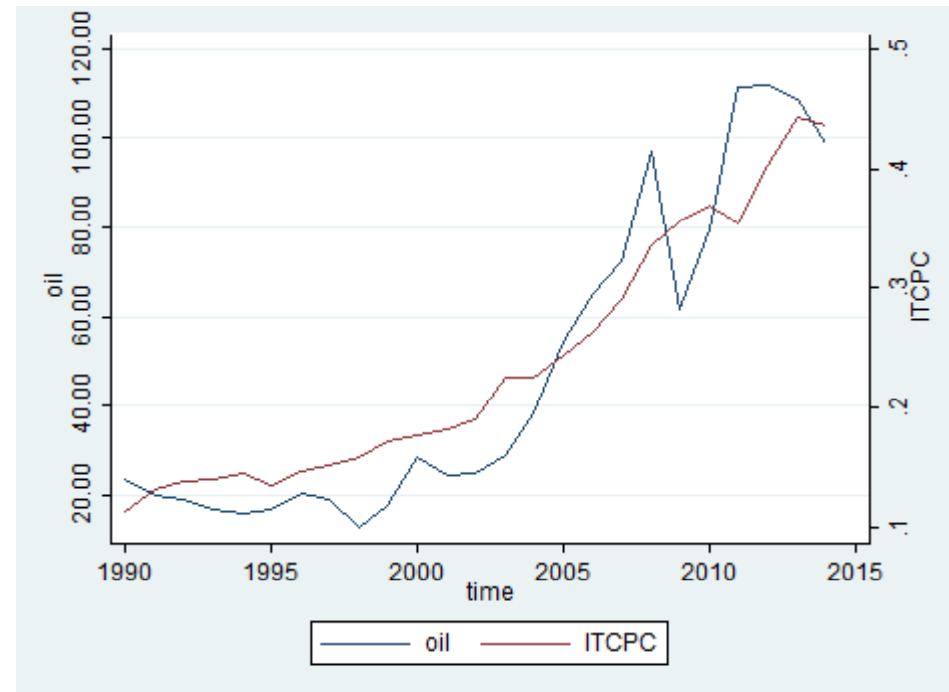
	$\beta_{i,t-2}$ coefficient	Normality Test P-Value H0: homoscedastic errors
<i>Europe28</i>	0.1281057***	0.3942
<i>Germany</i>	0.2075868**	0.0047
<i>Spain</i>	N.S.	0.2456
<i>France</i>	0.1686626**	0.7345
<i>Italy</i>	0.1869651***	0.4447
<i>Sweden</i>	N.S.	0.1572
<i>Finland</i>	0.1379178**	0.8606
<i>U.K.</i>	0.174111**	0.4798
<i>Norway</i>	N.S.	0.1196
<i>Turkey</i>	N.S.	0.2323

KEY RESULTS

- Response Time
- Long-run effect
- Neutrality

KEY RESULTS

- Italy?
- 0.114163 TOE/caput (1990)
- 0.436180 TOE/caput (2014)
- Non-Neutral



FURTHER STUDIES

- Other Regions
- Specific topics
- Development of Neutrality theory



THANK YOU!

Presented by: Matteo Mazzarano

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