

# Ownership Unbundling of Gas Transmission networks

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Infraday, Berlin 2008

1. The EU History
2. The Economics of Ownership Unbundling
3. Previous Empirical Literature
4. Empirical Estimations
  - Data
  - Method
  - Results
5. Conclusions

## Gas Directive 1998

- Consumer choice Stepwise opening of the gas market with a 30% target in 2010
- Choice of TPA regime (regulated or negotiated)
- Accounting separation as a minimum standard

## Results

- Differing rules across Europe (e.g. U.K. vs. Germany)
- Fragmented market
- Actually hardly any competition with some exemptions

## Gas Directive 2003

- Full market opening until July 2007
- Mandatory regulated TPA regime
- Legal unbundling as a minimum standard

## Results

- Switching rates very low, especially in the household sector
  - Highly concentrated markets
  - Increasing wholesale and end user prices suspect to abuse of market power
  - Insufficient cross-boarder capacity hampers new market entries
- Third legislative package with a focus on unbundling

# Economics of Ownership Unbundling

- Overall objective: maximization of social welfare
- Ownership Unbundling ought to
  - Provide non-discriminatory network access
  - Facilitate regulation
  - Stimulate market entry
  - Increase competition
  - Reduce prices
  - Increase social welfare

## Previous Empirical Literature

Analysis of the implications of regulatory reforms on sector performance in network industries (mostly retail prices)

- Steiner (2001)
- Hattori and Tsutsui (2004)
- Alesina et al. (2005)
- Copenhagen Economics (2005)
- Ernst&Young (2006)
- Brau et al. (2007)

Gas focus

# Previous Empirical Literature

## Focus

- OECD or EU-15
- Indicators for liberalization and privatization
  - Mostly based on “OECD International Regulation Database”
  - Copenhagen Economics (2005): Market Opening Milestones
- Different definitions of the unbundling variable: ownership/legal/accounting

## Method

- Mostly fixed and/or random effects estimations
- Only few applications of dynamic panel estimations

# Previous Empirical Literature

## Results

- Reforms with positive impact on end user prices
- Different driving forces and partly conflicting results, concerning gas
  - Brau et al. (2007): ownership and vertical separation
  - Copenhagen Economics (2005): ownership and network tariffs

## Drawbacks

- Application of aggregated indicators, e.g. OECD database
  - Weights arbitrarily chosen
  - Unbundling of transport not covered
- Marginal effect of ownership unbundling not identifiable
- Indicators: problems of multicollinearity
- Endogeneity problem: reforms might be driven by high prices



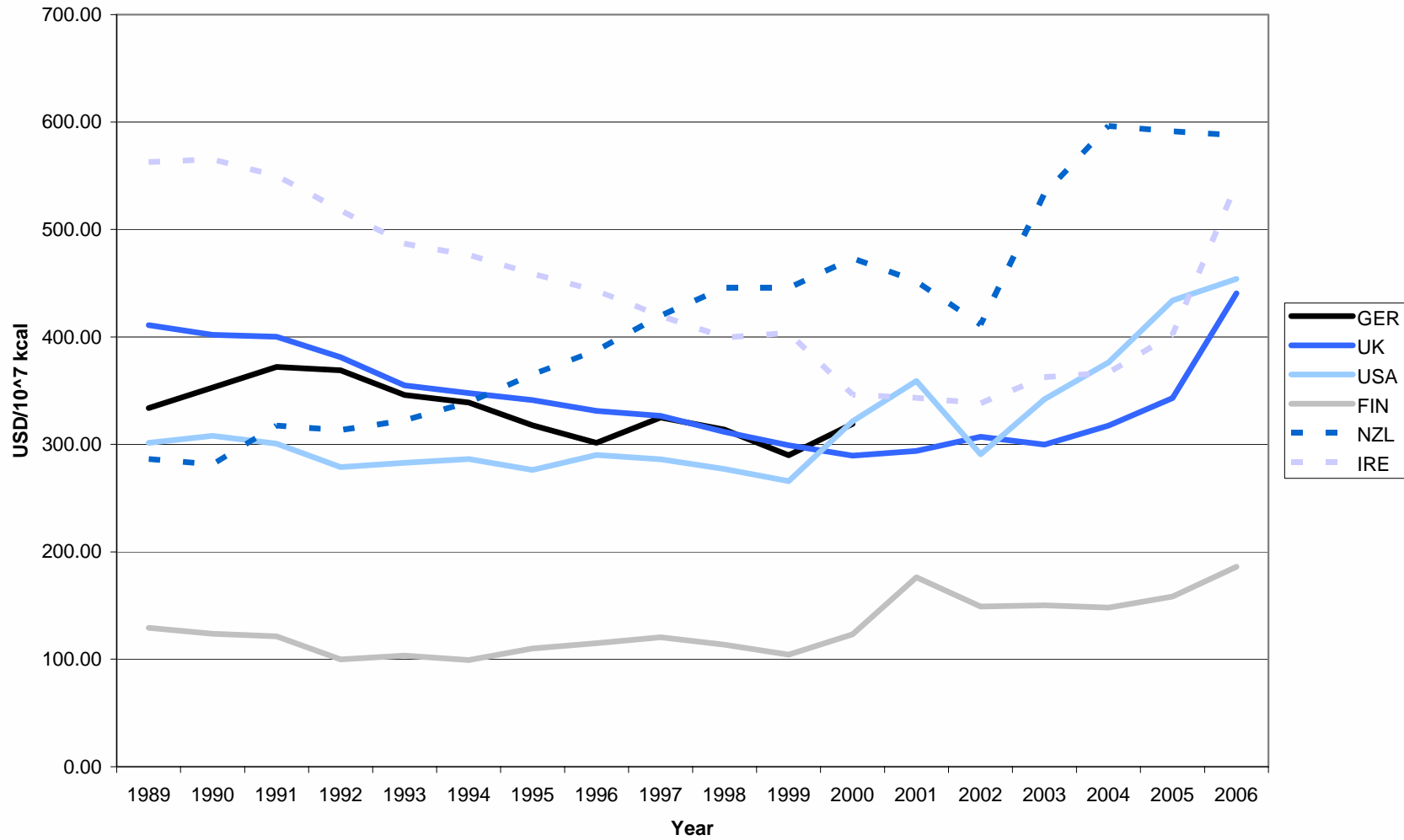
# Empirical Estimations

## Data–Retail Prices

- 29 OECD countries
- Household and industrial customers
- Without taxes in order to avoid distortions
- Period considered: 1989 - 2006
  - Explanatory power for the present
  - Coverage of periods pre and post major liberalization steps
- Source: IEA “Energy Prices & Taxes”
- Adjusted for PPP and CPI

# Empirical Estimations

## Data- Development Retail Prices



# Empirical Estimations

## Data– Development Retail Prices

- Based on the basic indicators out of the “OECD International Regulation Database”
  - Third Party Access as a discrete variable  
(with regulated TPA = 0)
  - Degree of market opening as a percentage
  - Structure of Ownership as a discrete variable  
(with 0 = fully privatized)
- Based on an own survey
  - Ownership Unbundling as a dummy  
(with ownership unbundled = 1)

# Empirical Estimations

## Data – Regulation Indicators & Control Variables

Variable	Expected Sign
Third Party Access	Positive
Market opening	Negative
Ownership	Positive
Ownership Unbundling	Negative

- Oil price world – gas contracts fixed on oil prices
- Retail price industrial customers – elasticity of demand
- GDP per capita – welfare level
- Energy supplied per 1,000 USD GDP – structure of the gas sector

# Empirical Estimations

## Estimators

- Unbalanced panel
- Static approach using a fixed effect estimator
- Dynamic approach using a Least Square Dummy Variable (LSDV) estimator developed by Bruno (2005)
  - Allows for the inclusion of lagged dependent variables
  - Corrects for the endogeneity problem
  - Approximation of the small sample bias via bootstrapping
  - Applicable to finite time horizons

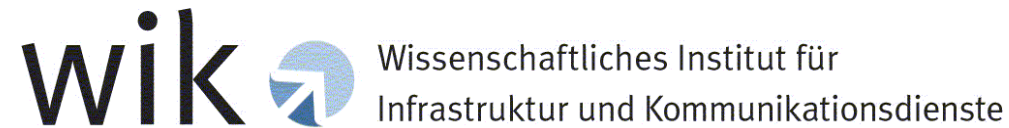
# Empirical Estimations

## Results

	Fixed Effect	Bruno (2005)
<b>Regulatory Indicators</b>		
Third Party Access	-0.045	-0.005
Market Opening	-0.002***	-0.001*
Ownership	-0.009	-0.019
Ownership Unbundling	-0.049***	0.035***
<b>Control Variables</b>		
End user price households (t-1, log)	--	0.586***
Oil price (log)	0.093*	0.110***
Oil price (t-1, log)	0.071**	0.003
End user price industry (log)	0.063	0.069**
GDP per capita (log)	-0.522	0.077
Energy supplied per 1,000 \$ GDP	-5.443***	-0.035
Constant	11.445***	--
R <sup>2</sup>	0.335	
No. of observations	251	232

## Conclusions

- Economic theory provides arguments in favor of Ownership Unbundling (pro-competitive effects, increase in social welfare)
- Previous research did not isolate Ownership Unbundling effect
- Our findings on regulatory reform and retail prices:
  - no significant effect of ownership unbundling
  - neither of TPA or ownership structure
  - main contribution by market opening



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