Budgetary Interests and the Degree of Unbundling in Electricity Markets - An Empirical Analysis for OECD Countries

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Introduction I

- considerably varying degree of electricity market liberalization across OECD countries

- possible explanations from empirical studies:
  - reform efforts increase after a (deep) growth crisis (Pitlik and Wirth, 2003; Pitlik, 2008)
  - right-wing governments tend to favor liberalization (Potrafke, 2010)
  - less stringent vertical separation in more corrupt countries (van Koten and Ortmann, 2008)
we find a relationship between (corporate income) taxation and electricity market reform (as measured by the level of unbundling)
we conjecture this relationship to be induced by misconduct of ministry officials/regulators taking advantage of a high taxation to meet personal ends
Dependent Variable

- degree of vertical integration in OECD electricity markets as measured by the ETCR’s sub-indicator (Conway and Nicoletti, 2006; OECD, 2011):

  - What is the degree of vertical separation between the transmission and generation segments of the electricity industry?
    - separate companies: 0
    - accounting separation: 3
    - integrated: 6

  - What is the overall degree of vertical integration in the electricity industry?
    - unbundled: 0
    - mixed: 3
    - integrated: 6

  - both questions are equally weighted
Main Explanatory Variable

- combined (central/sub-central) corporate income tax rate (OECD Tax Database, 2011)
  - data for 30 OECD countries
  - period from 1981 to 2007
Estimation Method

- standard OLS regression with country and year dummies
- regression model:

\[ vi_{it} = \alpha + \beta \cdot \text{taxrate}_{it} + \gamma \cdot X_{it} + \delta \cdot cdum_i + \theta \cdot ydum_t + \epsilon_{it} \]
### Estimation Results CITR

<table>
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<th>Column</th>
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<th>totaltaxrev(_{t-1})</th>
<th>totalgovdebt(_{t-1})</th>
<th>GDPgrowth(_{t-1})</th>
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**Note:** Columns (1)-(7) show estimation results of standard linear OLS estimations. Robust standard errors in parentheses. ***/**/* denotes significance at the 1%/5%/10% level.
findings suggest that a higher corporate income tax rate impedes vertical separation

this relationship is corroborated by the robustness checks
The Regulators’ Role I

- why should the misconduct of officials responsible for regulation induce this relationship?

- two periods of liberalization
  - early years (until around 1990): supervision of the energy sector primarily by ministries
  - the "golden age" (since around 1990): independent regulatory authorities (IRAs)
public officials employed by the state

Niskanen’s (1968, 1975) theory of bureaucracy suggests that they are interested in both

- a (non-tangible) output: supervision of non-competitive markets to prevent undesired sector outcomes and
- a discretionary budget: financing of higher wages and/or perquisites
The Regulators’ Role III - Early Years II

- Financial means of (responsible) ministries increase as total tax revenues increase.

- Regulatory measures which induce higher tax yields might hence increase the ministry’s budget.
  - The intense competition between generators after a full separation considerably reduces the sector’s profits.
  - Increasing the degree of unbundling reduces the tax basis.
  - The higher the CIT rate, the higher the loss in tax revenue.
  - Public officials should thus be inclined to defer unbundling when CIT rates are high (positive estimation coefficient).
The Regulators’ Role IV - The ”Golden Age” I

- although independent, also regulators might be interested in a good budgetary position of the state and hence high tax yields
  
  - the funding of more than 60% of 175 surveyed regulators (including 31 energy regulators) comes fully or partially from government (Hanretty and Koop, 2009)
  
  - 14 European electricity regulators reach an average financial independence of just under 0.75 (1 = full autonomy) (Gilardi, 2008)
  
  - 8 out of 15 energy regulators get all or parts of their funding from government (Johannsen et al., 2005)
  
  - in 11 out of 27 CEER member countries the energy authority’s budget forms part of the state budget; in 8 of these cases regulatees are not involved in the regulator’s funding (CEER, 2005)
The Regulators’ Role V - The ”Golden Age” II

- the objectives of experts employed by the state deviate (partially) from their public mandate (Moe, 1989)
  - might act in a way that is beneficial for themselves, but detrimental to society (similar to Niskanen’s (1968, 1875) public servants)
- regulatory bodies are prone to self-perpetuation and the quest for importance (OECD/IAE, 2001)
our paper provides an additional explanation for considerable differences in the degree of energy market liberalization

we conjecture ministry officials/IRA members acting as sketched by Niskanen’s bureaucracy theory to aim at higher appropriations for their ministry/agency
authority budgets indirectly affected by sectoral tax payments that, in turn, depend on the prevailing market structure might then result in competition-hampering regulations

accordingly, a clear delineation of the regulator’s financial interests from its regulatory goals is vital to achieve the latter
Thank you for your attention.