Benchmarking of German Electricity DSOs

Experiences and Lessons Learned from RP2 to RP4

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BNetzA scientific dialogue

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From RP2 to RP4

RP2: 94.7% (final report February 2014)	**RP3: 94.1%** (final report April 2019)	**RP4: 95.9%** (final report April 2024)
Swiss Economics / SUMICSID	Swiss Economics / SUMICSID with IAEW	Swiss Economics / SUMICSID with IAEW
11 parameters for 182 DSOs 1 Connections (norming parameter in SFA) 1 Meters 5 Cables/Lines 2 Peakload 1 Decentralized generation capacity 1 Surface [red: mandatory]	**9 parameters for 198 DSOs** 1 Meters (norming parameter in SFA) 4 Cables/Lines 2 Peakload 2 Generation capacity	**9 parameters for 194 DSOs** 1 Meters (norming parameter in SFA) 3 Cables/Lines 2 Peakload 3 Generation capacity
Core topics • Find meaningful model with mandatory parameters • Reflect energy transition • "City effect", labor conditions, East/West	**Core topics** • No mandatory parameters • Impact of energy transition (resulting in additional data collection) • Application of priority list of parameters • Outlier routines (no change)	**Core topics** • Definition of data request • Impact of energy transition • Technical Blocks: More meaningful base models • DSOs without concession area (BGH)
Changes related to "principal of prudence" + Exponential inefficiency assumption in SFA instead of half-normal + Cooks Distance cutoff threshold of 4/(n-p-1)	**Changes related to "principal of prudence"** – No mandatory parameters – DEA CRS + Efficiency Bonus + Partial publication of data	**Changes related to "principal of prudence"** + Full publication of data + Significance of SFA relaxed to 90% + Upscaling of SFA

Principle of prudence and remaining trade-offs

Rather extensive principle or prudence

- Set of variables not restricted to purely exogenous / output-oriented ones, e.g. length of cables/lines
- Selection criteria:
  - High minimal and average efficiency rated good,
  - Consistency to earlier benchmarks (model, results)
- Model development: extensive model search, purely statistical bottoms-up procedure
- Technical:
  - SFA: exponential assumption of inefficiency, requirement of significance of SFA relaxed to 90%, rather low Cooks Distance threshold, upscaling of scores, no strict avoidance of multicollinearity
  - Outliers are always excluded, also when no data error
- Second-Stage-Analysis, peer analysis (aim to avoid peers with high number of peer-count)
- Efficiency scores:
  - Minimal value of 60%, best-of-four instead of averages: Best-of-two of DEA and SFA, best-of-two of Totex and sTotex
  - Efficiency bonus

Important remaining trade-offs for modelers

- ARegV requirements on parameters / variables:
  - Not determined by decisions of operator
  - Not wholly or partially repetitive in their effect, not already represented by other parameters
  - Must be selected using qualitative, analytical or statistical methods that correspond to the state of the art.
  - same selection of parameters for DEA and SFA
- Selection criteria:
  - Cost drivers must make conceptual sense
  - Significant coefficients, positive signs
  - Significance of SFA (somewhat relaxed)
  - Completeness vs. try to limit multicollinearity
  - Ensure correlation of DEA and SFA scores
  - Consistent number of outliers

→ **Trade-offs are important to avoid data mining exercise**

Achieved improvements, room for further improvement

	Achieved Improvements	Room for improvement
Data definition and collection	• Involvement of consultants and stakeholders in data definition	• Yearly collection
Data validation	• Publication of data, involvement of stakeholders • More checks, more methods	• Validations based on yearly data • Consequences of incorrect deliveries by DSOs
Parameter development and cost driver analysis	• New and more refined parameters to reflect the energy transition • Introduction of priorities (RP3) • Definition of “technical blocks” that each covers one supply task (RP4)	• Model net analysis of cost drivers
Model development	• (LASSO) • Top-down procedure based on priorities (RP3) • Technical blocks procedure in RP4	• Further refine technical blocks
Frontier modelling	• More extensive model search in RP4 • Possibility to propose specific models for stakeholders in RP4	• Dynamic / panel models
Validation	• Exhaustive second-stage analysis	• Differentiate second-stage analysis between parameters where we care and where not

Thank you for your attention!

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