
BENCHMARKING THE COSTS OF ONTARIO POWER DISTRIBUTORS:

A Review of the Pacific Economics Group Report

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Benchmarking -- Introduction

- ❑ Benchmarking is a common component of regulation. For example, it can be used to:
 - ❑ set cost of capital and capital structure;
 - ❑ set productivity factors and inflation factors in price-cap formulae;
 - ❑ assess other performance indices e.g., service quality, reliability.

Benchmarking -- Introduction

- Incentive regulation leads away from detailed cost analysis by regulators.
- Proponents of cost benchmarking argue it is useful for
 - ‘rebasing’ costs from time to time
 - supplementing incentive regulation when ‘incentives’ are weak
 - informing policy decisions e.g., on industry structure.

Benchmarking -- Methods

- Methodologies for benchmarking costs and production.
 - Data envelopment analysis.
 - Stochastic cost frontier estimation.
 - Cost and production function estimation.
 - Index-based approaches.

Benchmarking – Estimation of Best Practices

- “Best-practice” methodologies:
 - data envelopment analysis
 - stochastic frontier estimation.
- In the present setting, these are of secondary interest principally because “best practices” are far more difficult to estimate accurately than average performance. Much more data would be required.

Benchmarking – Estimation of Best Practices

- Estimation of “best-practices” difficult to reconcile with “incentive regulation” which is premised in part on the idea that the regulator cannot estimate minimum costs especially accurately.
- A sensible alternative to estimation of “best-practices” is estimation of say “best-quartile” performance. Regression techniques can be applied (in particular, quantile regression).

PEG Report

- Analysis focuses primarily on estimation of regression models and indexes for OM&A costs.
- Explanatory variables / Cost drivers:
 - ❑ Number of customers
 - ❑ Price of labour
 - ❑ Retail deliveries
 - ❑ Distribution line circuit kilometers
 - ❑ Percent forestation of rural service territory
 - ❑ Percent distribution plant underground
 - ❑ Canadian Shield (binary)
 - ❑ Non-contiguous service territory (binary)

PEG Report

- Very high R^2 -- approximately 98% of variation in OM&A costs explained by the variables in the model.
- This would suggest that the overwhelming majority of OM&A costs can be explained by observable factors included in the model.

PEG Report

- Based on model estimates, authors calculate cost performance scores which vary widely:
 - The “most efficient firms” have costs 30% below the level predicted by the models.
 - The “least efficient firms” have costs 40% above the level predicted by the model.

PEG Report – Assessment

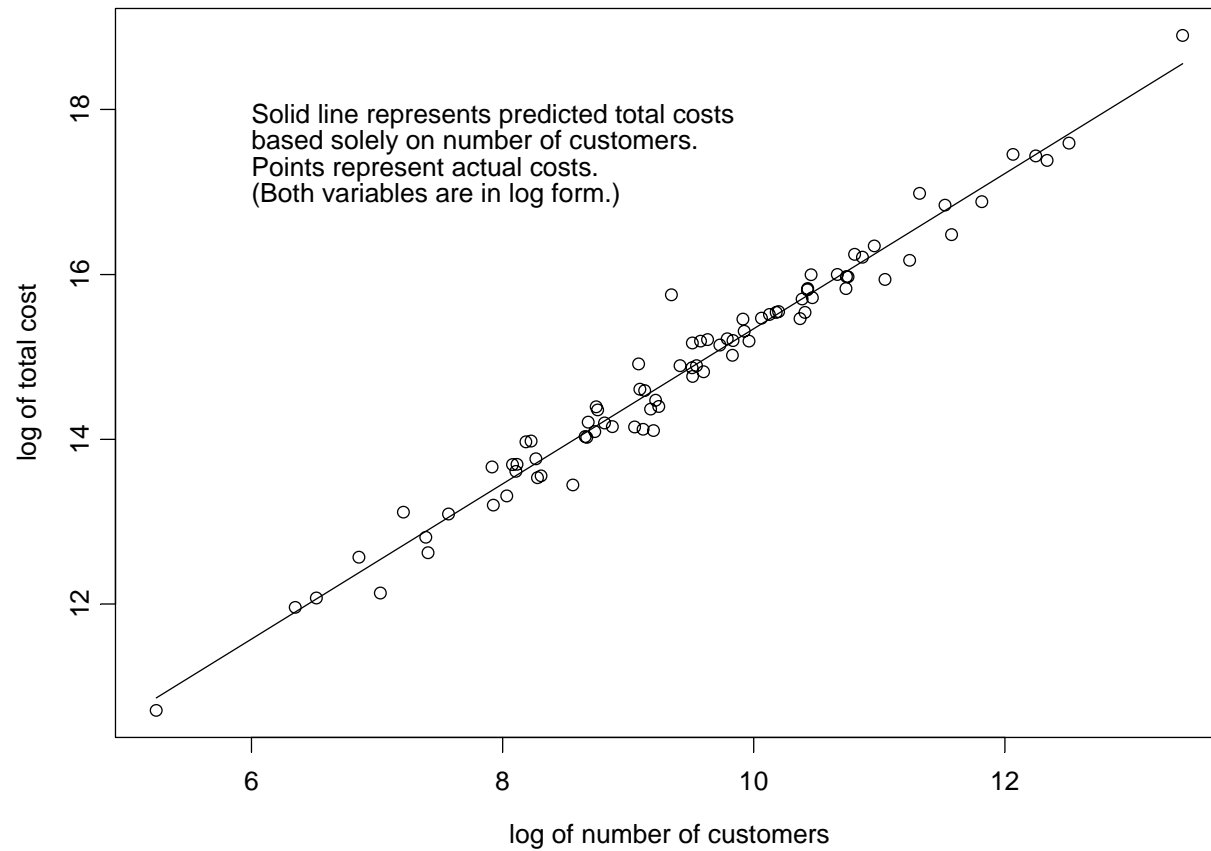
- Very high explanatory power of the estimated models would suggest that
 - ❑ a great deal is known about distributor costs;
 - ❑ costs can be predicted with a very high degree of accuracy given a small number of distributor characteristics.

 - These conclusions would be erroneous.
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PEG Report – Assessment

- Over 95% of variation in total OM&A costs is explained by a single cost driver -- the “number of customers”.

PEG Report – Assessment



PEG Report – Assessment

- If one uses “OM&A costs per customer” as the dependent variable, R^2 would be much lower.
- Differences in “OM&A costs per customer” are of greater practical interest because they are reflected in bills paid by customers.

PEG Report – Assessment

- In a capital intensive industry such as electricity distribution, capital costs typically constitute the majority of total costs. These are excluded from the analysis.
- Omission of capital costs limits value and applicability of empirical results.

PEG Report – Assessment

- ❑ **age of distribution plant** -- past analyses have found that aging distribution systems require increased OM&A expenditures;
- ❑ **service quality** – differences in service offerings, service quality and reliability can materially affect costs;

PEG Report – Assessment

- ❑ **voltage levels** – for historic reasons, some distributors possess systems with a variety of voltage levels; this can have a significant impact on OM&A costs;
- ❑ **customer mix** – distributor costs can be affected by the particular mix of residential, commercial and industrial customers that it serves.

PEG Report – Assessment

- Report suggests “economies of scale are available over a wide range of output in Ontario”. This conclusion is premature.
- Insufficient information provided as to the accuracy of the estimated scale effect.
- Moreover, scale economies in OM&A do not necessarily imply scale economies in total costs.

Conclusions and Recommendations

Omission of Capital Variables

- To the extent that capital-related variables are absent from the analysis, the cost models that are estimated in the PEG report do not represent standard practice in the economics literature.
- Data on capital variables need to be developed and incorporated in the models.

Conclusions and Recommendations

Skewing of Incentives

- Focus on OM&A costs can lead to skewing of incentives within the regulatory process -- distributors will have the incentive to increase capital costs in order to reduce OM&A costs.

Conclusions and Recommendations

Skewing of Incentives

- Potential impacts –
 - ❑ over-capitalization
 - ❑ under-spending on OM&A
 - ❑ sub-optimal decisions with respect to own/lease alternatives.

Conclusions and Recommendations

Data Issues

- Omission of “age of capital stock” can influence performance scores of some utilities by more than 10%.
- In addition to capital variables, other important cost drivers need to be considered:
 - ❑ service quality
 - ❑ load factors
 - ❑ differing voltage levels
 - ❑ customer mix

Conclusions and Recommendations

Data Issues

- The “wage” variable used in the PEG study is a proxy. Insufficient information provided on how it was constructed.
- Alternative wage data should be considered.

Conclusions and Recommendations

Model Validation Issues

- ❑ The “double log” and “translog” specifications that have been estimated have a long and venerable history in the economics literature,
- ❑ However, much progress has been made since their inception.
- ❑ Additional evidence on the validity of the estimated models needs to be provided, both in the single and multiple equation settings.

Key Focus Areas

1. Incentive issues:

- a. impacts on incentives of focus on OM&A costs rather than on total (including capital) costs
- b. rational incentive creation

Key Focus Areas

2. Data issues:

- a. capital related variables
- b. wage variables
- c. other cost drivers – e.g., service quality, voltage levels, customer mix
- d. accounting consistency

Key Focus Areas

3. Modeling issues:

- a. model specification
- b. model validation
- c. multi-equation modeling

Key Focus Areas

4. Regulatory issues:

- a. transparency / reproducibility of results
- b. need for an efficient mechanism by which a utility with “unfavorable scores” can address cost issues without excessive regulatory burden for the utility or the Board.