
PBR Consequences & Consumer Impacts

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PBR WORKSHOP,

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PBR – Big Picture

Why Move to PBR? What is the Point?

⇒ Increased performance incentives:

⇒ Enhanced efficiency and productivity performance/rates

⇒ Lower Rates

⇒ Better Reliability

⇒ Better Customer Service

⇒ But what about prudent expenditures/investment?

⇒ What about reliability/customer service?

⇒ Less Regulatory Burden

⇒ Regulatory Oversight Simplified

⇒ Regulatory Costs & Time Reduced

Responding to Incentives

1. Regulated utilities respond to incentives; we need to know what legacies exist / objectives.
2. Asymmetric information: regulators may not be aware of all implications of regulatory changes. Proper information and measurement are critical.
3. Changes may not be neutral.

PBR – Big Picture

As heard previously, Many Design Options

- ⇒ Multiple Inflation Index/X-factor Options
- ⇒ Plan Term
- ⇒ Exogenous Factors
- ⇒ Sharing Mechanisms
- ⇒ Off-ramps
- ⇒ Updating/Rebasing
- ⇒ Capital Treatment / Service Quality Provisions?
- ⇒ Hybrids?
- ⇒ Benchmarking (total vs. partial cost / frontier vs. average).

PBR – Big Picture

Many Design Options

- ⇒ LDCs have responded to prior regulatory frameworks/incentives and have embedded legacy issues.
- ⇒ Design options will affect incentives and future outcomes.

We will illustrate with some of our own research on these issues:

PBR – Big Picture

- ⇒ 2 years ago ENMAX applied for PBR (called multi-year FBR). The Application raised issues of:
 - ⇒ Benchmarking and efficiency frontier,
 - ⇒ Productivity
 - ⇒ Indexing, costs and rates
- ⇒ From Ontario, we have data and experience on how some of these things transpired
 - ⇒ These are real world issues, not just an academic exercise
 - ⇒ Taking a look at other jurisdictions can make some of these technical concepts more concrete.

Responding to Incentives

Brief Overview of Research Findings: Ontario LDCs

⇒ Pre-PBR MEUs (1988-1997):

⇒ Relatively efficient, but overcapitalized

- ❑ *technically efficient* (i.e., used of inputs efficiently)
- ❑ *allocative inefficiency* (i.e., may have wrong mix of inputs)
- ❑ reliability compares favourably with any jurisdiction; some with outstanding performance.

⇒ Change in incentive regime 1993:

- ❑ 1993 price freeze
- ❑ 1994 “contributed capital” allowed into rate base.

⇒ Utilities responded to changed incentives.

Responding to Incentives

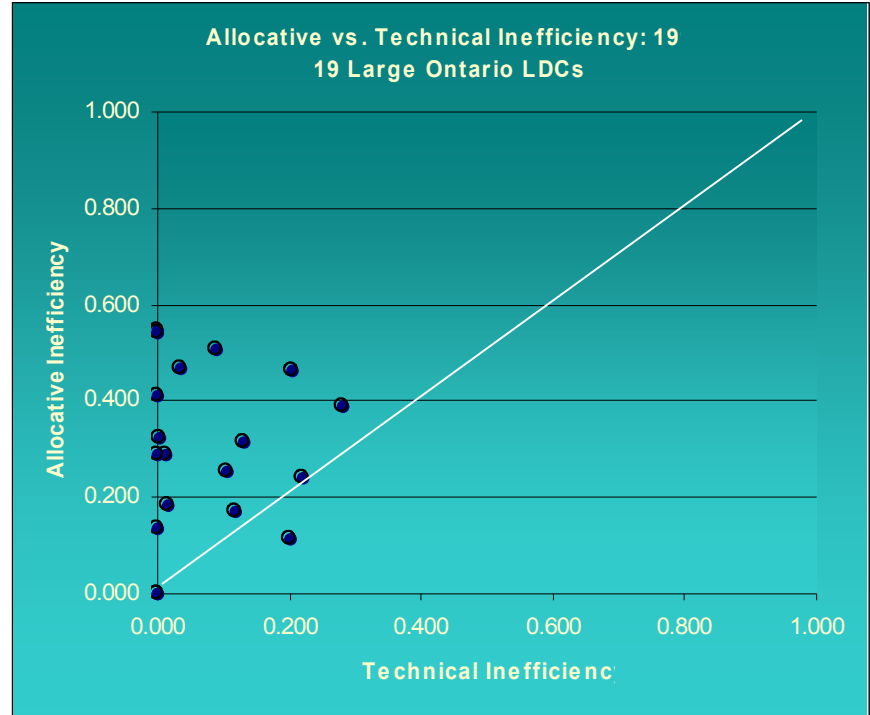
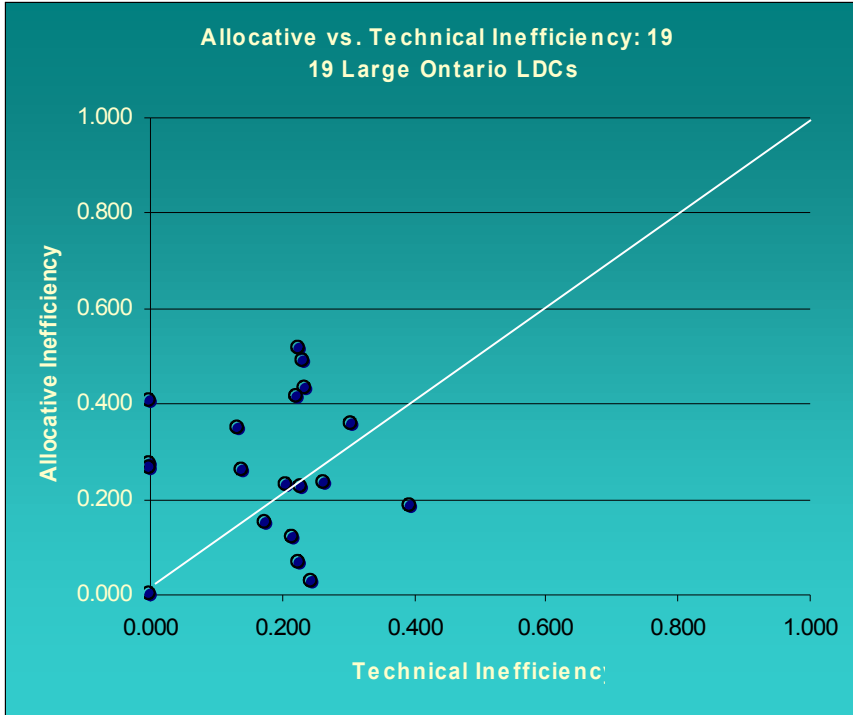
PBR Can Incent...

Size	Annual TFP % chg	
	1988-93	1993-97
Large	-0.5%	1.9%
Medium	0.2%	1.9%
Small	-0.3%	2.4%
All	-0.2%	2.1%
N=48		

Source: Cronin, et al., OEB Staff Report “*Productivity and Price Performance of Electric Distributors in Ontario.*”
<http://www.oeb.gov.on.ca/documents/cases/RP-1999-0034/ppp1.html>

Responding to Incentives

PBR Can Incent...



Source: F.J. Cronin and S.A. Motluk, "PBR with Endogenous Market Designs: The Road Not Taken" Public Utilities Fortnightly, March 2004.

Responding to Incentives

Pre-1998 Reliability Ontario Municipal Distribution Utilities

	3 yr Avg	5 yr Avg
SAIDI		
Mean	1.23	1.20
Top Quartile	0.32	0.42
SAIFI		
Mean	1.49	1.51
Top Quartile	0.34	0.54

Responding to Incentives

- PBR was mandated in 2000. Since then a mix of price freeze, various PBR/IR regimes and COS have been employed.
- Mixed messages / unclear objectives.

PBR Outcomes Since 2000?

What outcomes have we seen since introduction of PBR?

- ❑ Efficiency has declined
 - Technical Efficiency (TE) and Allocative Efficiency (AE) have declined
- ❑ Productivity has declined
- ❑ Rates have increased
- ❑ Reliability has degraded
- ❑ Costs have increased despite government messaging that Mergers & Acquisitions would save up to 30%

Don't view PBR as a panacea with guaranteed outcomes.

Outcomes: Average Annual TFP

- Average annual TFP (“Total Factor Productivity”)

Pre 2000:

- 1988-1997: 0.75% to 0.86%
- 1993-1997: 1.63% to 2.05%

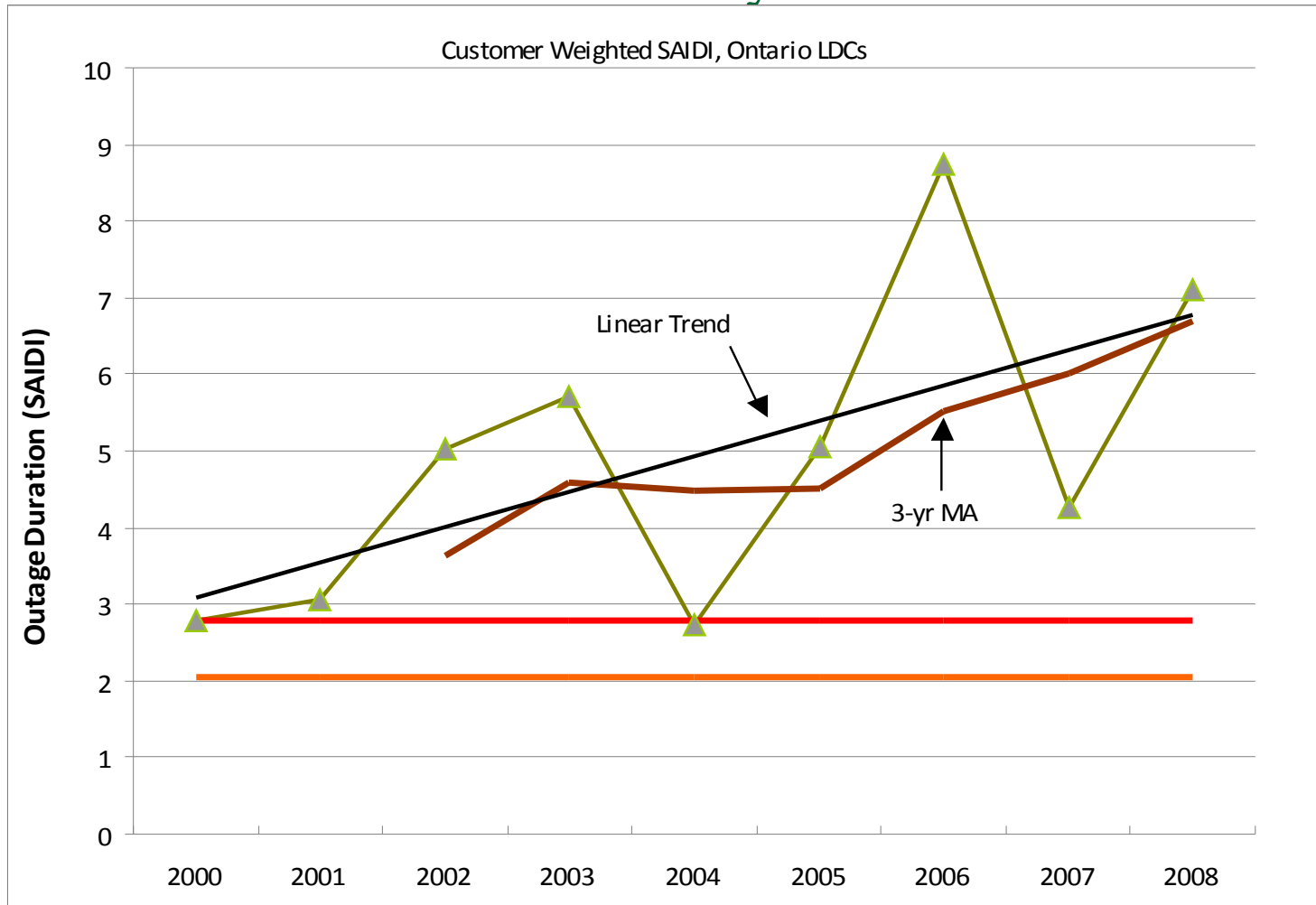
Source: OEB Staff Productivity Study, Cronin et al. available at <http://www.oeb.gov.on.ca/documents/cases/RP-1999-0034/ppp5.html>

Post 2000:

- 2002-2007: -0.5% to -1.67%

Source: London Economics International on behalf of Coalition of Large Distributors, available at http://www.oeb.gov.on.ca/OEB/_Documents/EB-2007-0673/presentation_LEI_20080808.pdf

Outcomes: Reliability



Updated from F.J. Cronin and S.A. Motluk, 'Ontario's Failed Experiment Part2: Service quality suffers under PBR framework,' Public Utilities Fortnightly, August 2009.

How Have LDCs Responded?

Reliability

- Few studies on reliability

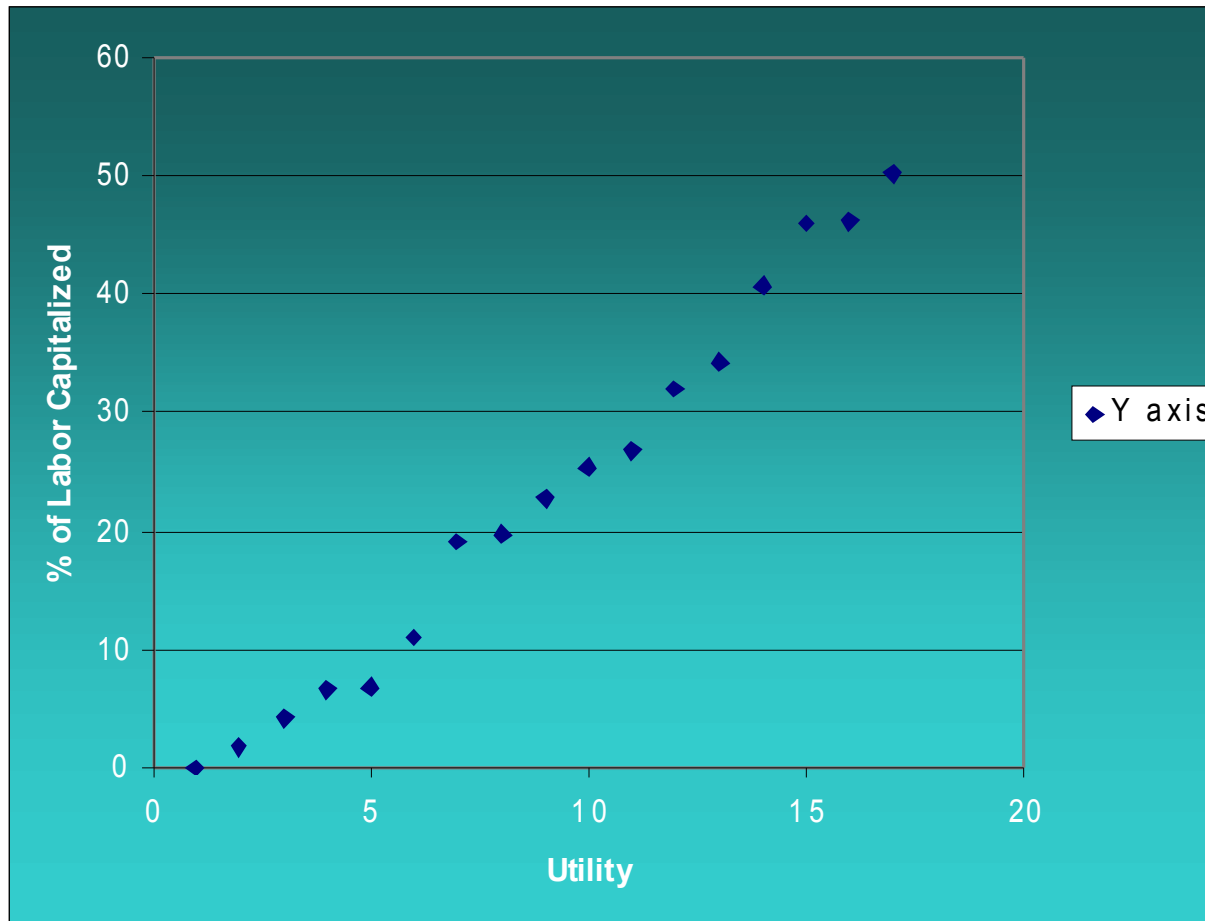
- Perverse incentives have driven regulatory responses:
 - (e.g. CEER (Council of European Energy Regulators, Ofgem, NVE (Norway), US States, others
 - Some jurisdictions have:
 - imposed mandatory standards
 - monetized reliability values
 - determined socially optimal reliability levels and associated required investment/O&M.

Incentives and Outcomes

- Total Cost Benchmarking that recognizes the capital intensive nature of LDCs and multi-output/multi-input nature of electricity distribution.
- Partial cost (O&M only) benchmarking may not reveal true efficiency of LDCs
 - Perverse incentives:
 - reward inefficient, punish efficient
 - Reward decreased reliability, punish superior reliability

Understanding Incentives

- Example: Capitalized Labour, Ontario LDCs (2000-2001)



Understanding Incentives

■ Example: Ranking by OM&A vs Total Cost

Source: Cronin & Motluk, "Examining the (Mis) Specification of Peer Group Performance Benchmarks for Electric Utilities," Presented at North American Productivity Workshop II, Union College, New York (2002).

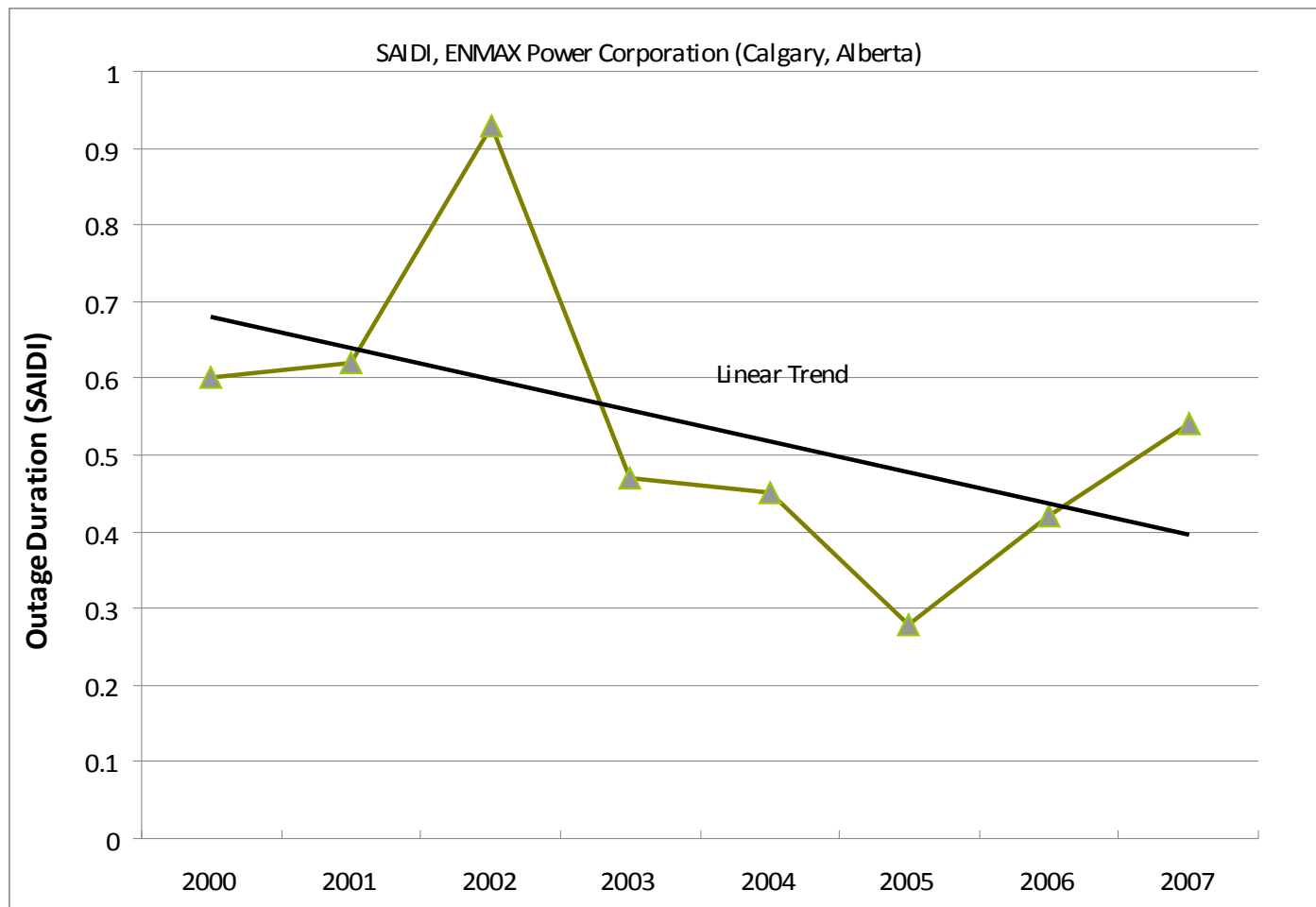
Utility	OM&A Ranking	Total Cost Ranking	Difference in Rankings	Percent Difference in Ranking
1	3	43	-40	-0.83
2	7	30	-23	-0.48
3	8	24	-16	-0.33
4	10	35	-25	-0.52
5	11	33	-22	-0.46
6	12	39	-27	-0.56
7	15	45	-30	-0.63
8	18	11	7	0.15
9	20	6	14	0.29
10	21	7	14	0.29
11	22	10	12	0.25
12	24	41	-17	-0.35
13	25	42	-17	-0.35
14	28	46	-18	-0.38
15	31	47	-16	-0.33
16	31	47	-16	-0.33
17	33	9	24	0.50
18	37	3	34	0.71
19	38	18	20	0.42
20	42	23	19	0.40
21	45	14	31	0.65
22	46	21	25	0.52
23	47	25	22	0.46

Conclusions

PBR not a panacea; success not guaranteed

- Know your legacies
- Know your objectives
- Have the right choice of timeframe/consistency (e.g. Norway example)
- Benchmarking appropriately (e.g., total costs)
- Mandatory reliability standards are imperative
- Data (ongoing and consistent)
 - Full data collection on capital, reliability and operational characteristics

What Are We Trying To Achieve?



AUC Proceeding ID. 12, Exhibit 148, New UCA IR 17, Attachment.

What Are We Trying To Achieve?

Residential Rate Comparison 800 kWh/month – 2010 Rates

EPCOR \$16.33

ENMAX \$20.32

Hydro Ottawa \$26.68

Horizon Utilities \$22.56

Toronto Hydro \$31.50

Range: +11% to +93%

What Are We Trying To Achieve?

SAIDI, Horizon, Ottawa, ENMAX



Menu PBR: OEB Staff 1st Gen Proposal

Selection	PF	ROE Ceiling
A	1.25	10
B	1.5	11
C	1.75	12
D	2.0	13
E	2.25	14
F	2.5	15

Source: OEB Staff Draft Distribution Rate Handbook, July 1999, Chapter 4, available at <http://www.oeb.gov.on.ca/documents/cases/RP-1999-0034/Chapter%204.pdf>

Additional Reading Material

Yardstick PBR: F.J Cronin and S.A. Motluk, '*PBR with Endogenous Market Designs: The Road Not Taken*,' Public Utilities Fortnightly (March 2004).

Benchmarking: F.J. Cronin and S.A. Motluk, '*Flawed Competition Policies: Designing 'Markets' with Biased Cost and Efficiency Benchmarks*,' Review of Industrial Organization (Vol 31, No.1, August 2007).

Factor bias and efficiency: F.J. Cronin and S.A. Motluk, '*Agency Costs of Third-Party Financing and the Effects of Regulatory Change on Utility Costs and Factor Choices*,' Annals of Public and Cooperative Economics (Vol 78, No.4, Dec 2007).

Menu PBR: F.J. Cronin and S.A. Motluk, '*Dealing with asymmetric risk: Improving performance through graduated conditional ROE incentives*,' Public Utilities Fortnightly, (May 2009).

Mixed Messages and Objectives: F.J. Cronin and S.A. Motluk, '*Reviewing Electric Distribution Restructuring in Ontario: Policy Without Substance or Commitment*,' Utilities Policy (Vol.14 No.1 2006).

Mergers, Scale and Scope: F.J Cronin and S.A. Motluk, '*How Effective Are M&As in Distribution? Evaluating the Government's Policy of Using Mergers and Amalgamations to Drive Efficiencies into Ontario's LDCs*.' Electricity Journal (Vol 20, Issue 3, April 2007).

Service Quality and PBR: A. Ter-Martirosyan and J. Kwoka, '*Does Incentive Regulation Compromise Service Quality? The Case of U.S. Electricity Distribution*,' European Association for Research in Industrial Economics (EARIE), 2009.

A. Ter-Martirosyan, '*The Effects of Incentive Regulation on Quality of Service in Electricity Markets*,' GWU Dept. of Economics Working Paper presented at International Industrial Organization Conference, Northeastern Univ. (2003).

F.J. Cronin and S.A. Motluk, '*Ontario's Failed Experiment Parts 1 and 2*,' Public Utilities Fortnightly, July-August 2009.

Norwegian Experience: Edvardsen, et al., '*Productivity and regulatory reform of Norwegian electricity utilities*' in T. Coelli and D. Lawrence, eds., Performance Measurement and Regulation of Network Utilities, Elgar (2006).

Grasto, K., '*Incentive-based Regulation of Electricity Monopolies in Norway*,' Publication 23/1997, Norwegian Water Resources and Energy Administration, Oslo (1997).

Forsund, F. and Kittlesen S., '*Productivity development of Norwegian electricity distribution utilities*,' Resource and Energy Economics, 20 (1986).