

3rd Generation IRM for Electric Distributors

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PEG Assignment

- Difficult assignment
- Unavailability of essential data

Agree With PEG

- Examination of 1st Gen PBR for 3rd Gen IR
- Use of monetary values not physical counts of capital
- Characterization of remaining problems
 - Forced shortcuts result in "problematic" applications to capital calculations for IR and total cost benchmarking
- Differences in LDC labour capitalization has not been controlled for
- Higher costs for LDCs with higher reliability has not been accounted for.

Disagree With PEG Approaches

- Use of only OM&A in benchmarking
- Use of OM&A and proxy capital measures
- Use of US LDC data to derive TFP

Interrelated Issues

- Comments provided on IR, benchmarking and service quality regulation
- Three are intricately related
- Comments on one and not the others would be incomplete

Issues

- Integrated nature of electricity distribution operations in IR
- OM&A benchmarking
- Capital usage
- Proxy capital measure
- Capital cost shares
- Use of US LDC data
- Multi-dimensional output and just and reasonable rates
- Relationship between reliability and expenditure

Issues cont.

- Reliability costs and observed « inefficiency »
- Perverse profit incentives
- De facto IR and deterioration of Ontario reliability
- Internalizing social cost of interruptions
- Critical, multi-dimensional role of IPI
- Productivity factor-ROE menu incorporates LDC diversity

Recommendations

- Short run:
 - PF – ROE menu based on Ontario frontier v. average TFP
 - IPI
 - ❖ share of capital in LDC costs ranges from 45% (1st Gen) to 63% (PEG 3rd Gen) versus 15 – 17 in GDP price index
 - ❖ during periods of rapid change in financing costs, GDP seriously deficient in tracking interest rates
 - ❖ trough-to-peak rate changes average 400 bp, 17 months
 - ❖ rising inflation will force central banks to aggressively raise rates in near term
 - ❖ likely funding gap of on-going capital projects with GDP price index
 - assessment of reliability compliance to 2000 standards

Recommendations

- Medium run:
 - work on integrating continuous LDC operating data 88 – 07
 - work on integrating capital data from early 1970s to 2007
 - assess benchmarking approaches for Ontario LDCs with Ontario data
- Long term:
 - benchmarking on total costs with Ontario data
 - integrated SQR
 - WTP, socially optimum level of reliability

Integrated Nature of Dx Operations

- Joint nature of LDC output
 - Just and reasonable rates cannot be determined unless costs are assessed jointly with SQ
 - Failure to reflect all outputs seriously biases assessment in favor of LDCs with lower reliability
- Substitution relationships among LDC's inputs
 - LDCs with equal costs can operate with very different proportions of capital and OM&A

OM&A Benchmarking

- Fails to recognize integrated nature of operations
- LDC's can and do make management decisions regarding appropriate distribution of budgets between OM&A and capital
- Share of capitalized labour 10% to 50%
- Resulting capitalized labour 7% to 39% of OM&A
- Inverse relationship between capitalized labour per customer and OM&A per customer
- Cost rankings change with capitalized labour added to amount of OM&A

Exclusion of Capital Usage from Benchmarking

- PEG excludes properly calculated capital costs from IR and benchmarking
- Mini Inventory Model rejected for use in benchmarking report used in IR report
- Lack of use of capital costs undermines cost comparisons and « consumer dividend » recommendations

Biased Capital Measure in TFP

- Capital proxy has widespread and significant errors across LDCs relative to properly determined capital cost
- Undermines PEG's TFP analyses
- Unacceptable as basis for an IR

Biased Capital Shares

- PEG capital share of 63% based on 2002-2006 Ontario data using capital proxy (Net fixed assets)
- Substantial and wide spread error between real capital cost and proxy; for most LDCs the proxy over estimates amount of capital
- IPI developed in 1st Generation PBR rigorously examined and evaluated
- Input weights based on results of 48 LDCs extensively tested
- Preferable to use these weights to PEGs which are based on proxy capital

Use of US LDC Data

- Very large, urban, US LDCs
- May have very different organizational structures from Ontario LDCs
- Many also distribute gas and some are vertically integrated
- Some under IR, some not
- Unlikely good peer group for Ontario LDCs
- US municipal LDCs could provide better peers
- As structured US peer group cannot be basis for 3rd Generation IR

Multi-dimensional Output

- LDCs produce and sell multi-dimensional output
- Service quality/reliability among others can vary substantially producing different products
- Regulators have dual responsibility and must ensure prices are just and reasonable and ensure appropriate level of service quality/reliability

Reliability and O&M Expenditure

- Using a medium length time series of data filed with Board finds that among LDCs' O&M expenditures are statistically related to reliability performance
- Low reliability causes LDC to raise budget
- Relationship should be keenly appreciated by regulators especially when transitioning from COS regulation to IR

Reliability Costs and Observed Inefficiency

- Reliability varies widely with cost
- LDC benchmarking to account for differences in reliability performance/costs
- Mis-identify « higher cost » LDCs as less efficient than lower cost LDCs with lower reliability
- If so, benchmarking will penalize high-reliability LDCs and reward low reliability LDCs
- Perverse incentive scheme could incent high reliability LDCs to reduce OM&A and improve benchmarking score
- Results in decline in reliability

Proposed IR and Perverse Profit Incentives

- Shift to IR can put OM&A costs in conflict with pursuit for profits
- Cost reductions earlier in plan are worth more to utility than later reductions
- Since capital may not be subject to significant changes within earliest years of plan term,
- Utility could be incented to cut OM&A beyond prudent level for service quality and reliability

De Facto IR and Deterioration of Ontario Reliability

- On average, service quality appears to have declined in Ontario over 2000-2006 period
- Some LDCs not compliant with performance guidelines
- 2000 reliability itself appears to have declined relative to mid1990s
- Appears Board has not examined reliability performance

Critical Multi-Dimensional Role of IPI

- Automatic adjustment for LDC cost changes
- Obviates need for frequent COS proceedings
- Mirrors COS process by adjusting rates on prudence basis using sector average as prudence test
- Mitigates mistakes in RAM associated with macroeconomic price index that will over/under compensate LDCs
- Establishes yardstick competition among LDCs with better performers holding down costs
- Provides proper incentive signals to LDC/customers

Critical Multi-Dimensional Role of IPI

- Use of GDP requires adjustment for IPD and PD
- Efforts required and issues faced with IPI faced in establishing IPD and PD
- No work done so far on IPD and PD for 3rd Gen IR
- In advocating IPI not seeking perfection
- Recognition that some approaches so inappropriate can do more harm than good
- IPI/GDP relative historical performance says nothing about future performance

GDP Price Index and Financing Gap

- Use of GDP price index will most likely severely under finance capital projects during next term of IR
- Over last 50 years, prime rate has risen 413 basis points from trough to next peak during 10 interest rate cycles in US
- Average duration of movement from t-to-p is 17 months
- Last cycle in 2004 – 2006 saw 425 basis point increase
- Persistent historical divergence between GDP price index and capital costs
- Last cycle saw prime rise from 4.0 to 8.25 percent; at same time GDP price index ranged roughly from 1 to 3 percent

GDP Price Index and Financing Gap

- With widespread inflation in all stages of PPI (i.e., final, intermediate, crude) central banks will move aggressively to contain inflation in near term
- GDP price index will generate revenue increases insufficient to fund on-going capital additions unless these are internally financed
- Such financing gaps will likely lead to reductions in O&M or off-ramp applications
- O&M reductions will lead to further deterioration in reliability

PF-ROE Menu

- PF-ROE Menu incorporates LDC diversity into IR
- Natural solution to diversity issue
- Menu can be easily structured to reach explicit sharing goals between customers and shareholders
- Research on 1st Generation data indicates that initial frontier LDCs improved TFP at higher rate than did interior LDCs both 88-93 and 93-97
- 10 year TFP growth rate of frontier LDCs is 1.6 percent
- Use 1.6 percent to set upper bound and overall 10 year average for lower bound

PF-ROE Menu

Selection	Productivity Factor	ROE	Customer-Shareholder Split
1	.8	8.5	NA
2	1.0	9.5	57 – 43%
3	1.2	10.5	same
4	1.4	11.5	same
5	1.6	12.5	same

Issue of PBR Data

- 1999 PBR Yardstick Survey – yardstick groupings and TFP
 - List A -Yardstick data for 1998
 - List B
 - ❖ 1988-1997, 1998 Labour/Compensation
 - ❖ 1973(1977) -1998 Capital
 - ❖ 1988-1997 Miscellaneous Items
- 1998-1999 first annual PBR filing requirement - rate unbundling
- 2000-2001 annual PBR filing requirements as per 2000 Rate Handbook
- 2002 on - RRR PBR filing requirement

General Recommendations

- Systemic Risk of Improper IR
 - No benchmarking until can be done correctly with full costs (Input) and reliability performance (Output)
 - Full costs better reflects cost structure and input choices, more equitable, evaluates societal resource usage, limits inappropriate incentives
 - Start with data from 1999 PBR surveys

General Recommendations cont

- Factor Input Efficiency
 - Distortions caused by non-market capital price
 - Essential to reflect full factor input choices/ costs
 - Calculate conventional measures of capital costs for equitable cost comparisons
 - **Adaptation period with feasible efficiency targets**
- IR, Cost Incentives and SQR
 - IR w/out standards/penalties results in cost cut
 - **Include SQ as benchmark**

General Recommendations cont

- European SQR Efforts
 - CEER encourages data collection, customer surveys, standards, single customer guarantees
 - Some European countries use WTP and interruption costs in IR
 - Board should review European experience and implement SQ mandates with incentives/penalties.

Short-Term Recommendations

- Interim Term
 - Consider 3rd Gen as transition plan to fully developed IR with term no more than 3 years
- Data Preparation and Analysis
 - Top priority of transition term
 - Work with stakeholders on implementing effective and expeditious research plan
- Mid-Term Review
 - Review for 1st tranche LDCs to begin to operation longer term IR.
- IPI
 - Use 1st Gen framework for 3rd Gen IR

Short-Term Recommendations cont

■ PF-ROE Menu

- Use existing research on LDCs or e.g. Norway menu to set PF
- 1st Gen frontier - mean TFP 1.6 %
- 1st Gen overall - mean TFP 0.8%

Selection	Productivity Factor (percent change per year)	ROE Ceiling (percent)
A	1.25	10
B	1.50	11
C	1.75	12
D	2.00	13
E	2.25	14
F	2.50	15

Short-Term Recommendations cont

- PF and Budget Sufficiency
 - Recommendations assume steady state – sufficient OM&A and capital funding
 - Need for increase in “O” – data on SQ, budgets and ROE indicate budget gap for “O”
 - Need for increase in “A” related to increasing regulatory burden
- SQR and Reliability
 - Examine SQ performance for compliance; cause of deterioration
 - Examine de-facto IR and proposed IR/incentives

Long-Term Framework

- Long-term framework (e.g. 15 years)
 - Staged approach for eliminating inefficiencies
 - Plan terms long enough for LDCs to reach efficiency targets (e.g. 5 years)
- Benchmarking Basis
 - Account for joint nature of output and interrelationship among inputs
 - Total cost; SQ; total inefficiency (+ allocative)
- Socially Optimal SQ
 - Collect WTP and customer costs
 - Integrate reliability cost in 4th Gen IR rebasing

Conclusions

- Recommendations to overcome problems acknowledged by PEG and other issues
- PEG's suggested application of 1st Generation analysis to 3rd Generation
- Recommendation on IPI
- Adopting these recommendations provides the Board with a basis for an effective IR scheme for both the 3rd and subsequent generation IR for the Ontario electricity distributors.