

The Brattle Group

Incentive Regulation: Lessons from other Jurisdictions

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Significant Experience with Different Types of PBR

- ◆ “RPI-X” type regulatory plans:
 - UK—“cost-forecast”-type rate path set to recover forecast of costs
 - Ontario—“productivity”-type: rate path set at current costs minus historic productivity trend
- ◆ Rate freeze / moratorium
 - Many US examples, varying plan terms
- ◆ Multiple forward-looking test years
 - California and BC examples—like UK but without RPI-X formula
- ◆ Targeted measures
 - Fuel purchase costs, losses, etc.
 - Service quality, DSM, etc
- ◆ “Menu” approach
 - UK—menu of cost targets with different degrees of true-up (sharing)

UK Experience with RPI-X

- ◆ Based on five-year cost forecasts (“building-blocks”):
 - Utility forecasts costs for next five-year period
 - Regulator reviews forecasts in light of
 - Actual spend in recent period(s)
 - Forecasts of the other utilities
 - Various formal and informal benchmarking exercises
 - RPI-X revenue path is set to give same NPV over five years as the NPV of the adjusted cost forecast; added quality of service incentives
- ◆ PBR seen as highly successful in UK
- ◆ Continual evolution
 - “Menu approach” introduced for electricity distribution capex
 - Equalising incentives for capex and opex, addressing timing issues
 - Recent regulatory review concluded “building block” approach is working well and should be retained
 - Exploring longer-term plans; incentives to reduce carbon footprint

“Menu” Approach in UK Electricity Distribution

- ◆ Capex forecast subject to “gaming”
 - Is the investment program real, or is there built-in scope for under-spend?
- ◆ Hard to dismiss asset replacement arguments
 - With uneven age profiles and different service territories and customer mix, capex forecasts differed significantly from historic levels and across firms
- ◆ Regulator (Ofgem) offered a “menu”—i.e., utility chooses either:
 - Larger capex allowance, but trued-up close to actual spend
 - Firm can invest if it needs to, but does not gain from under-spending
 - Smaller capex allowance, only partial true-up
 - Firm induced to reveal unbiased (less biased) investment forecast
- ◆ After success with capex menu, extended to O&M costs

UK Also Shows “RPI-X” is not that Simple

UK electricity distribution allowed revenue in year t:

$$= BR_t + PT_t + IP_t + LCN_t + IG_t - K_t - AUM_t - CGSSP_t + CGSRA_t$$

Where:

$$BR_t = PU_t \times PIAD_t - MG_t \quad (\text{PIAD}_t \text{ is the “RPI” term})$$

$$TB_t = TP_t - TA_t \quad TA_t = TV_t \times PIAB_t \quad IP_t = IL_t + IQ_t + IT_t + IFI_t$$

$$K_t = (RD_{t-1} - AR_{t-1}) \times \left[1 + \frac{(I_t + PR_t)}{100} \right] \quad MPT_t = MPC_t + MPA_t$$

$$PT_t = LF_t + RB_t - HB_t - IED_t + MPT_t + TB_t + UNC_t$$

$$LF_t = LP_t - LA_t \quad AL_t = ALP \times UD_t$$

$$RB_t = RP_t - RA_t$$

$$RA_t = RV_t \times PIAB_t$$

$$IL_t = UIL_t + PCOL_{t-1} - COL_t + PPL_t$$

$$UIL_t = LR \times PIAL_{t-2} \times (AL_{t-2} - L_{t-2}) \times \left[\left(1 + \frac{I_t}{100} \right) \times \left(1 + \frac{I_{t-1}}{100} \right) \right]$$

continued...

This formula appears in the first half of the approx. 60 page portion of the regulatory order defining allowed utility revenue.

Ontario gas distribution

- ◆ Much of the effort in the proceeding went into determining “X”
 - Complicated statistical/econometric models
 - Results sensitive to model design, input assumptions, data issues
- ◆ Econometric model suggested $X = +2.0\%$
- ◆ Index number approach suggested $X = -0.1\%$
- ◆ Insufficient data to measure productivity using Canadian firms
 - Reliance on US data raises comparability issues
 - Similar story with electricity distribution in Ontario and Alberta
 - Similar story in Australia

US PBR Experience

- ◆ Use of PBR for utilities and distribution companies declined
 - 16 states with broad-based PBR examples in 2000
 - 10 states in 2003
 - 5 states in 2007
- ◆ Rate-freezes/rate moratoriums were most widely used approach
 - With or without earnings sharing and service quality incentives
 - Rate freeze avoids litigation over X
 - Does not work in the increasing cost environment of recent years
- ◆ Some broad-based PBR examples used today:
 - 5-yr Maine and Massachusetts RPI-X plans with new X-factors of 0.4-1%
 - California now uses 3-year forecasts of revenue requirements (in place of various RPI-X approaches used since early 1990s)
- ◆ Wide-spread use of targeted incentives (e.g., DSM)
- ◆ Automatic COS formula-driven rate adjustments in AL, MS, LA

Australian PBR Experience

- ◆ Traditional “building-block” RPI-X approach similar to UK (cost-forecast RPI-X)
- ◆ Recent debate over permitting some utilities to use productivity-based (TFP) approach instead
- ◆ Regulator concluded:
 - There is a possible benefit to set X-factors based on productivity analyses rather than forecasted revenue requirements
 - Insufficient data to calculate TFP trends
 - Firms should start to collecting data (as no regrets option),
 - Firms could “opt in” to use TFP approach once sufficient data has been collected (which would likely take at least 8 years)

Netherlands Electricity Distribution

- ◆ First generation PBR plan used Data Envelopment Analysis (DEA) to identify relative efficiencies among utilities
 - Higher X-factors for firms deemed “less efficient” based on statistical results
- ◆ That and subsequent plans dogged by appeal and legal dispute
- ◆ Approach undermined by
 - “black box” statistical methodology, giving unexpected answers about which firms were deemed most efficient
 - Insufficient “buy-in” from distribution companies and other stakeholders
 - First generation plan (as well as subsequent plan) immediately dogged by appeals and years of legal disputes
- ◆ DEA approach abandoned: 2nd and 3rd generation used index-based TFP approach to set X-factor

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