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 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:

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

$$TB_t = TP_t - TA_t \quad \text{TA.} = TV. \times PIAB. \quad IP. = IL_t + IQ_t + IT_t + IFI_t$$

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

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

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

$$RB_t = RP_t - RA_t$$

$$RA_t = RV_t \times PIAB_t$$

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

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

continued…
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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Incentive Regulation

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