

Incentive Regulation and Implementation

Total Factor Productivity (TFP)

Utility Regulators Forum

Session One - Incentive Regulation

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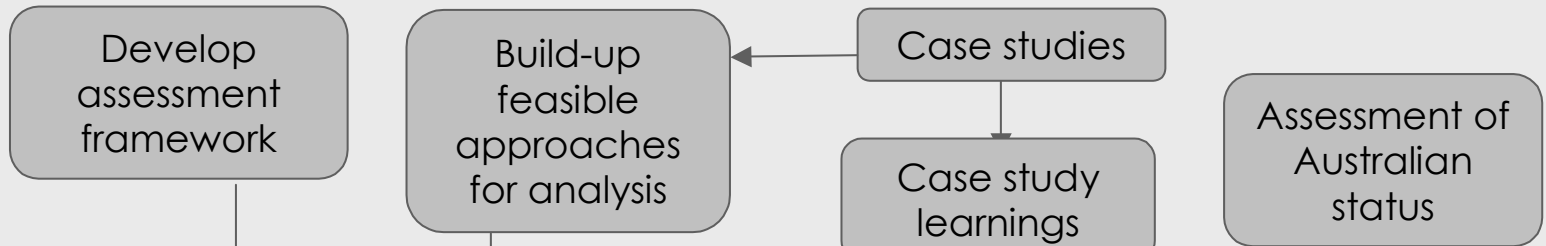
Stamford Hotel, Melbourne

Introduction

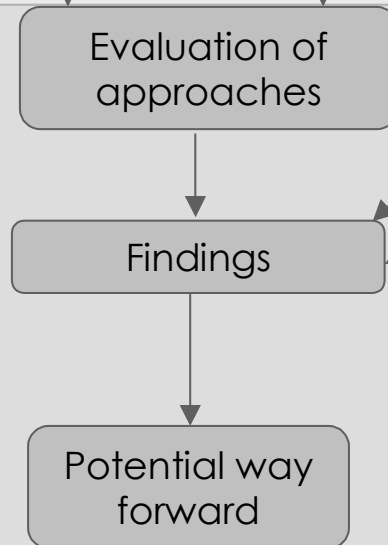
- Approach
- Description of options for CPI – X regulation
- Approaches to CPI – X
- Assessment of CPI-X regulation
- Assessment in Australian context
- Preconditions for adopting TFP approach
- Conclusions

Approach to study

Stage 1



Stage 2



Options for CPI-X regulation

- **Small number of options defined in detail:**
 - ◆ Possible to identify myriad of options that theoretically could be used
 - ◆ Terminology / jargon sometimes loosely applied
 - ◆ Detailed design important in understanding incentives

- **Options identified for analysis:**
 - ◆ Building blocks approach (the status quo)
 - ◆ TFP approaches based on building blocks
 - ◆ Frontier methods from building blocks
 - ◆ Indexation against basket of comparable services

Building blocks approach

- Status quo approach, well established and understood
- Addresses company specific factors in detail
- Requires regulator to have access to specialist skills and expertise
- Decision-making at disaggregated level
- Incentives dependent on approaches to glide path, length of regulatory period, WACC and establishing 'efficient cost levels'
- Implemented where expertise and resources available, and often uses secondary analysis techniques
- Tends to be used where priority is on efficient cost levels while assuring financial sustainability

Total Factor Productivity

- Non statistical productivity growth measure that accounts for all factors of production (Capital, Labor, Raw Materials etc)
- TFP methodology and index requires judgments based on options
- Paper did not consider TFP issues in detail
- Key TFP methodological issues include:
 - ◆ Methodology
 - ◆ Time period
 - ◆ Data requirements (eg measurement of capital)

TFP approaches based on building blocks (Strawman)

- Different options for incorporating TFP, so defined “strawman”
 - Unless it is agreed that existing prices are about right, building blocks used to set starting price
 - Setting ‘X’
 - ◆ analysis of expected rate of change in TFP (generally assumed to be historical rate)
 - ◆ stretch or company specific factors
 - Likely to include ‘Z’ factor for exogenous factors
 - Risks of actual returns and prices differing from anticipated may be addressed through “Offramps” and potentially Earning Sharing Mechanism (ESM)
 - Default starting price for next regulatory period based on indexed P_o ,
 - ◆ unless cost review (of some description)

Offramps

- **Offramps act as safety net for re-opening of “regulatory contract”**
- **Objective**
 - ◆ address situations where the existing regulatory arrangements are no longer applicable
- **Examples**
 - ◆ Actual returns significantly different (too high or too low) from those anticipated
 - ◆ Major industry restructuring takes place
 - ◆ Force majeure events

Earning Sharing Mechanisms

- **ESMs optional (common in North American PBRs)**
- **Allow for price to adjusted outside deadband:**
 - ◆ **Within deadband, price adjusted based on index formula alone**
 - ◆ **Outside deadband, sharing of under and over-performance between shareholders and customers (ie prices adjusted up or down)**

Experience

- Implemented in North America for some electricity and gas utilities, extensively used in telecommunications
- TFP analysis
 - ◆ Results from TFP Studies depend on method of calculation, sample, time period for measuring productivity trends
 - ◆ “Like most statistical data, TFP calculations can be made to sing if they are tortured long enough”
- Process for setting X
 - ◆ In US is evidence based
 - ◆ “We received testimony from the utility (arguing that the offset should be relatively low), and from the public advocate (who argued it should be relatively high)”

Frontier approaches

- Involves forecast of costs for initial year as basis for decision on starting price
- 'X' set based on estimation of efficient frontier and rate of change required to reach (or make progress towards) frontier
- Usually utilise Data Envelope Analysis (DEA) technique
- Mechanistic approach which tends to work hand in hand with associated appeal processes
- May not be consistent with providing sound incentives for investment (if used in isolation)
 - ◆ DEA cannot identify whether gaps in performance due to difference in performance or error
 - ◆ Reliance on company appeal criticised

Frontier approaches (cont)

- Selected where
 - ◆ Considered to be significant potential for efficiency gains
 - ◆ Evidence of large variations in performance (Netherlands)
 - ◆ Large number of entities (eg Norway – 200 electricity distributors)

Indexation against basket of comparable services

- Price indexing occurs with reference to changes to prices for comparable basket of services
- Examples
 - ◆ Initial prices based on company costs
 - ◆ Price adjustments based on index of regional electricity distribution charges
 - ◆ National Grid United States, Massachusetts Electric
- Not widely used,
- Potentially effective where cost of other regulatory processes exceed benefit

Conceptual Assessment

- **Assessment Framework based on analysis of**
 - ◆ **Market context and concepts of competition**
 - ◆ **Regulatory context and overriding objectives**
 - ◆ **Regulatory design principles**

Key Assessment Criteria

- ◆ A number of assessment criteria developed. Key ones included

- ◆ Economic efficiency
 - ◆ Consistency with static allocative efficiency
 - ◆ Consistency with productive and dynamic efficiency
- ◆ Extent regulatory approach creates distortions between
 - ◆ Capital and operating expenditures
 - ◆ Service offerings
 - ◆ Business structure
- ◆ Risks of inability to finance investment or continue to operate the business
- ◆ Risks of profits becoming too high and hence politically unsustainable
- ◆ Constrain or encourage regulatory opportunism

Economic efficiency

- **CPI – X regulation incorporates elements of allocative, productive and dynamic efficiency**
- **Debate on approach for CPI – X regulation concerns the “right” balance**
- **Building Blocks**
 - ◆ **Allows company specific costs to be addressed**
 - ◆ **Multi year price control, glide paths partially delink from costs**
 - ◆ **But concern with impact on dynamic and productive efficiency and costs of regulation**
- **TFP approach**
 - ◆ **Conceptually may make prices more independent of company’s own cost which may enhance dynamic efficiency**
 - ◆ **Lower regulatory cost (probably)**
- **Conclusions:**
 - ◆ **In practice, difference between TFP approach and Building Blocks depend on details of design of each**

Extent regulatory approach creates distortions

- **Distortions in choice between capital and operating expenditures**
 - ◆ Potential for gaming
- **Service offerings**
 - ◆ Convergence of electricity/gas/ telecommunications through shared utilization of infrastructure and overhead
 - ◆ Effect of regulatory approach on efficiency
- **Business structure**
 - ◆ Purchasing services from affiliates (eg asset trust purchasing from affiliated service company)
 - ◆ Effect of regulatory approach on incentives to establish efficient business structures

Risks that the regulatory approach could lead to an inability to finance investment

- Networks ‘long-lived’
- Effects of regulatory approaches on investment will be determined by shareholder / lender perceptions of the operation of the regime over several periods.
- While, in any given year, returns can fluctuate, investors need to consider that the regulatory regime offers a credible promise that returns offered are reasonable, relative to risks
- In practice, no “ binding” regulatory approach can ignore costs otherwise errors in the application of the regulatory approach could deny legitimate expectation of cost recovery

Risks that the regulatory approach could lead to profits becoming too high and hence politically unsustainable

- Importance of the political sustainability of pricing.
- If outcomes of regulation perceived as 'unfair' then political pressures might develop to change the regulator or change the regulatory regime

Does regulatory approach constrain or encourage regulatory opportunism

- “Performance can be satisfactory with a wide range of regulatory procedures as long as arbitrary administrative action can be restrained”.
 - ◆ Levy and Spiller
- “Incentive properties of any regulatory mechanism depend on how the regulated utility expects to be treated in the future. Uncertainty about the behavior of the regulator is arguably as important as the stated methodology in shaping the utilities’ responses.”
 - Williamson

Assessment of TFP approach based on building blocks

- **Conceptual assessment**
 - ◆ Theoretically - has economically desirable properties,
 - ◆ Offramps protects against inability to finance
 - ◆ Offramps, ESMs (optional) protect against prices becoming too high
 - ◆ Offramps, precedent, constraints to regulatory opportunism
- **Practice- effectiveness for meeting regulators objectives, depends on the detailed design, package of instruments, level of parameters and approach to implementation**
- **Chosen where focus is to place priority on market style incentives and desire to move away from cost of service regulation (and usually also to decrease regulatory costs)**
- **Examples studied occur within mature regimes where there was comfort with price levels and established regulatory accounting and decision-making regimes**

Assessment of TFP approach based on building blocks in Australian context

- If objectives for productive and dynamic efficiency and reduced regulatory cost considered important then merit in developing TFP approach
 - ◆ Therefore an important area for consideration is exploring what potential for improving productive and dynamic efficiency in particular industries
- Need to consider preconditions related to outcomes from particular detailed design

Key preconditions for adopting TFP approach

- Regulators and companies must be willing to rely on judgement in the determination of 'X' based on TFP studies
- Regulators may need to be willing to explicitly define return thresholds (upper and lower limits), which would be used to trigger offramps (or ESMs).
- Utilities must be willing to accept variations in outcomes within a band defined by the offramps, with no glide path mechanism
- Willingness to set parameters that facilitate the incentive effects of TFP based price caps

Conclusions

- **Specific regulatory objectives drive the approach**
- **Objectives may vary between sectors and over time**
 - ◆ **Prices are “right”, concern about productive, dynamic efficiency ?”**
 - ◆ **Focus on correct prices? (say investment levels, profitability, excess costs)?**
- **TFP based approaches may better promote productive and dynamic efficiency and reduce regulatory costs (but depends on detailed design)**
 - ◆ **If these outcomes considered important then should start development of TFP approaches**
 - ◆ **Lead time significant – need to consider current and future objectives**
- **Summary: merit in adding TFP approach to the regulators “kitbag” but not a “silver bullet”**