

*Hybrid System
Case Study Teams: Debriefing a
Potential Solution*

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Session 16

Overview

- This is an example of how this problem might be solved.
- It involves some simplifying assumptions and may not be the best solution.
 - Whether it is “best” depends on many factors, most of which are not considered in this case study.
- There may not be one best solution for a particular situation.



Objectives

- Infrastructure Expansion
- Predictability for Investors
- Protect residential customers from unnecessary price increases

“Answer”

- Per customer revenue caps with two baskets (residential and business) and three options
- Option 1: $I - 2$ with RORR
- Option 2: $I - 5$ with earnings sharing
- Option 3: $I - 7$ with pure revenue caps



Price vs Revenue Caps

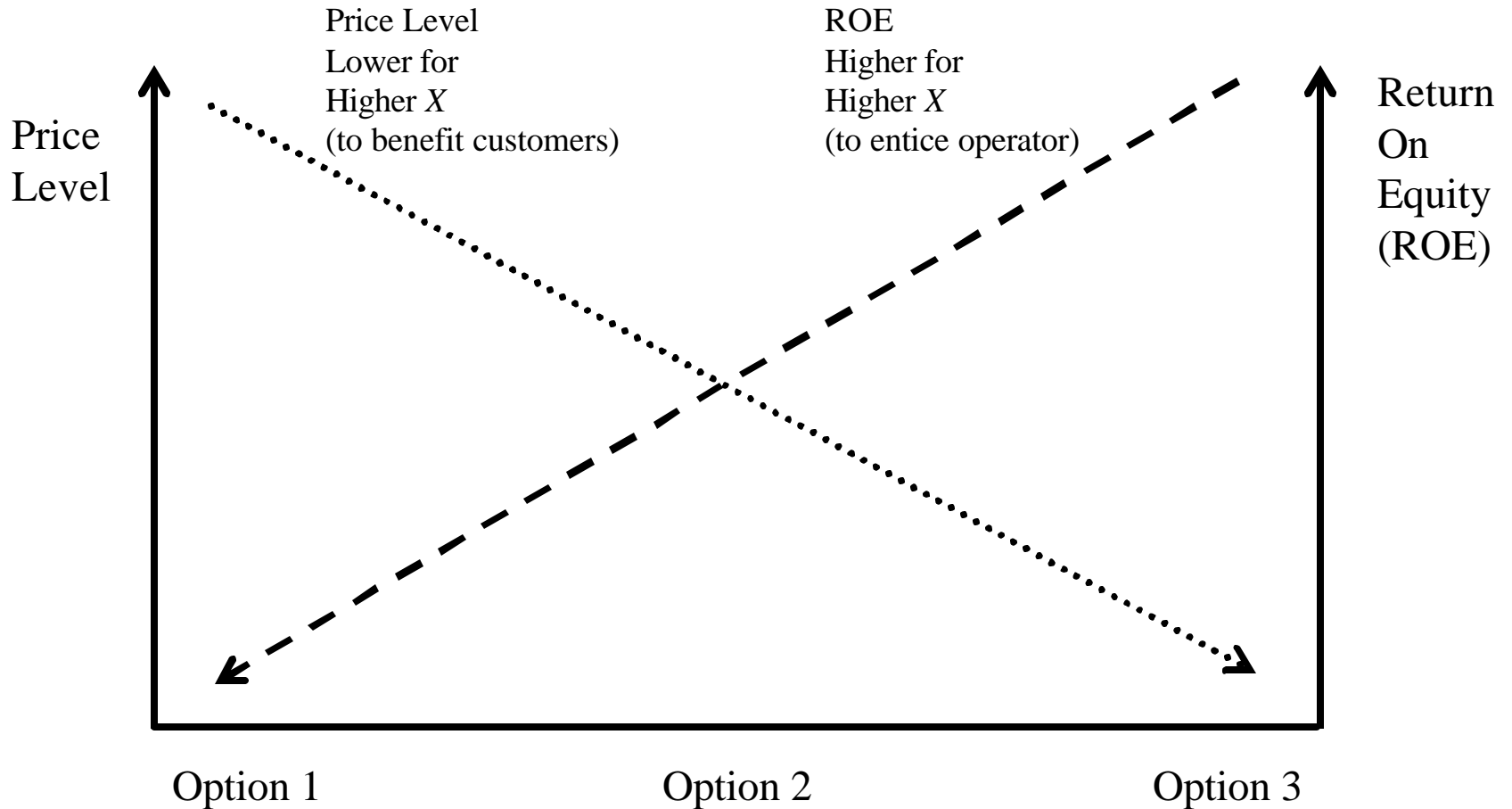
- We assume that we pass through fuel costs and that all other costs vary with the number of customers
 - Based on assumptions about network expansion and demand
- Therefore, we choose to cap revenue per customer
 - Residential service basket
 - Business service basket
- Benchmark to develop *X*-factors



Benchmarking

- We obtain data from nearby countries and benchmark our operator on cost per customer and cost per kWh
- We find
 - Some operators are like ours in that their costs decrease 2 percentage points each year relative to inflation
 - Other operators' costs decrease 6 percentage points each year relative to inflation
 - The most efficient operators' costs decrease 10 percentage points each year relative to inflation
- Three types of operators implies three options

Option design



Option Design (cont.)

	Option 1	Option 2	Option 3
Effect on Customer	I - 2	I - X_M , where $X_M > 2$	I - X_H , where $X_H > X_M$
Effect on Operator	ROE = COE	ROE _M > COE	ROE _H > ROE _M



Option 1

- X -factor = 2
- Earnings sharing
 - None. Rate of return regulation

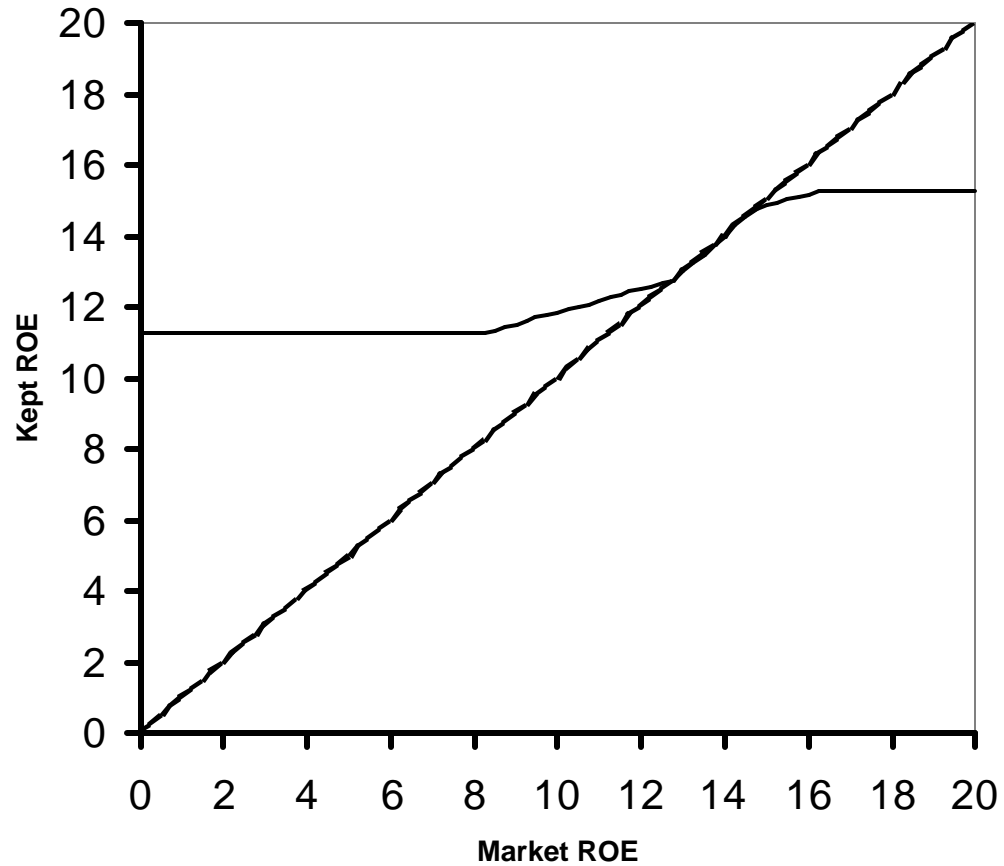


Option 2

- *X-factor = 5*
 - Less than 6 to provide incentive to choose
- Earnings sharing
 - Goals:
 - limit ROE to no more than 1.5 above COE
 - Allow ROE to exceed by COE by at least 1 to provide incentive to choose this option

Sharing for Option 2

Sharing Mechanism for Option 2



Sharing for Option 2 (cont.)

- Earnings sharing
 - Lower bound at 11.25 market ROE
 - From market ROE 11.25 to 12.75, customers bear $2/3$ and operator bears $1/3$
 - From market ROE 12.75 to 14.75, operator keeps
 - From market ROE 14.75 to 16.25, operator keeps $1/3$
 - All market ROE above 16.25 returned to customers



Option 3

- $X\text{-factor} = 7$
- Earning Sharing
 - None. Operator keeps