"Decoupling" Sales and Profits (An IT Perspective)

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Introduction

- Disclaimer
- Focus on how utility IT department fits into decoupling.
  - Boonin background in billing and forecasting
  - Focus on electric utilities, although decoupling more widely used in gas industry
- Will not focus on:
  - What is being done where by whom
  - Policy nuances except in passing

Decoupling Made Simple

- Utilities' profits are tied to (*coupled with*) sales.
- Sales decrease. Revenues decrease. Profits decrease.
- "Coupling" of sales and profits make utilities naturally resistant to conservation, energy efficiency, demand-side resources (DSR) and other actions that reduce sales.

Historical Overview of Sales to Profits

- In 1960s new resources drove down price. Declining block rates were common. Sales were increasing and there was little encouragement of conservation.
- In 1970s, PURPA encouraged state commissions to look at rate design as way to encourage conservation. New units usually increased the price of electricity. Flat or increasing block rates became more common.
- In the 1990s the emphasis was on competition and rate designs were sometimes frozen.
- Today, carbon caps, IRP and energy independence initiatives are increasing the attention on decoupling.

Utility Rates

- Utility rates in two main components: fixed fees and variable fees based upon consumption.
- Fixed fees generally do not cover all the fixed costs. Some fixed costs and profits are recovered from the variable (usage-based) fees.
- Profits are earned after all fixed cost are covered (at the margin).
- When usage goes down a little, profits can go down a lot.

Effect of Decreased Sales on Revenues and Profits – Extreme Example

Effect on Revenues

(Sales decrease from 110 to 100 units. Price is $1.50/unit)

Original Revenues 110x$1.50=$165

New Revenues 100x$1.50=$150

$15

9% decrease in revenues

Effect on Profits

(Sales decrease from 110 to 100 units. Price is $1.50/unit)

Fixed Costs	$100
Variable Costs	$55

Original Profit= $165-155=$10

New Profits $150-$100-$50=$0

$10 or 100% decrease in profits

Why the Current Emphasis on Decoupling

- Increased emphasis on conservation, energy efficiency and demand-side resources that reduce sales.
- Some underlying reasons
  - Carbon caps that rely on energy efficiency
  - More emphasis by states and FERC on demand-side resources
  - Renewable resources with net metering
  - Energy independence programs stressing the importance of the domestic negawatt

Decoupling in Vogue

- Energy efficiency recognized as important by broad coalitions.
- Rate cases are unpopular and expensive.
- Today's metering and information technology systems allow for adjustments to be made with a sharper pencil.
- Positives have overcome negatives such as increases in operating efficiency between rate cases, cost reductions indirectly related to sales (low-income conservation programs that reduce bad debt) and mismatching of responsibility because of estimated billing.

Sales Fluctuate for Many Reasons

- Weather – more critical to gas and water usage
- Economy
- Number of customers
- Price elasticity
- External energy efficiency
- Utility energy efficiency, conservation and DSR

The Goal of Decoupling

- Eliminate disconnect between utilities' quest for least-cost resources and sales-driven profits.
  - Focus could be on sales losses associated with utility programs not all sales fluctuations.
- Make utilities indifferent between customers conserving or consuming.
- Focus is on sales as established in a rate case and what actually occurs.
- Keep profits unchanged regardless of sales.

Vertically integrated vs. wire utilities with generation sister companies

- Indifference between supply and demand resources
  - Vertical – revenue recovery or traditional recovery can make utility indifferent
    - Power plant costs in rates
  - Wires company with generating sister – making wire company whole may not make generating company whole
    - Fixed cost of power plant not included in rates.
    - Wire company made whole.
    - Revenue recovery does not address drop in sales to generating company.
    - Generating company unaffected by Revenue adjustment. Issue is what is the impact of energy efficiency program on market clearing prices and total sales

Vertically Integrated vs. Wires Utilities Example

Decrease in sales from 110 to 100 units. Original price $1/unit. Decoupling Adjustment of $0.10/unit

Vertical Utility	Wires Utility
Base Adjusted Revenues $110	Base Adj. Rev.
Fixed Costs $100	Regulated Utility $77
Profit $10	Deregulated Co. $33
Actual	Decoupling Adjustment only applies to utility
Revenues $100	
Decoupling Adjustment $10	
Profits $10	Only $7.70 recovered not $10

Impact on Customers

- Assume that starting point is a fair allocation of costs, based upon test year usage.
- Some customers conserve and others do not.
- Both get reallocation of fixed costs. Both see price increase.
- Conserver has total bill decrease, but not as much as if no adjustment were made.
  - Did conserver incur participation cost?
  - Is the program still cost effective from customer's perspective?
- Customer who did not conserve gets a rate and cost increase even though behavior hasn't changed.

Impact on Customers Example

Conservers	Users
Base 55 units $55	Base and Actual 55 units $55
Actual (pre adj) 45 units $45	$0.10/unit surcharge $5.50
$0.10/unit surcharge $4.50	Adjusted Bill $60.50
Adjusted Bill $49.50	

Focus on Electricity

- Much of presentation is transferable to gas and water utilities but key differences exist.
- Gas and water sales more weather dependent that electricity
- Gas more price elastic than electricity in certain classes or applications as there are may be substitute fuel sources such as oil.
- Electric usage per customer often increasing with more end-use devices while gas usage per customer is generally decreasing with gas prices and appliance efficiency up.

Decoupling Adjustment Clause Mechanics

Decoupling – Overall Revenue Approach
Base Sales

- Adjust total sales.
- Start with base period sales, usually from last rate case. Stop!
  - $, kW, kWh?
  - Use $ -
    - Separate by customer class
    - Separate by source (demand, energy portion of tariff)
  - Go

Decoupling – Overall Revenue Approach Use Revenues

Stop again!

- Stripping out revenues with offsetting costs from base and actual.
- Goal is to keep income protected. Applying factor to a base that includes offsetting costs could be a windfall.
- Biggest element is commodity. Usually fairly distinct and easy to separate.
- Gross receipts tax or other dedicated fees. Usually fairly distinct but may be as a separate adjustment or bundled.
- Any revenue with offsetting cost that has been rolled into base rates may make posting on bill more difficult as the factor should be applied to the net revenues not the gross.

Example
Net vs. Gross Revenues
(Sales Decrease form 110 to 100 units)

Net Revenues
($1/unit)

Base revenue net of variable costs plus profit = $110

Actual revenues = $100

Adjustment Factor
($110/$100)-1=0.1

Decoupling Adjustment $10

Gross Revenues
($1.50/Unit)

Base fixed costs+ profits=$110
Base Variable costs= $0.50

Adjustment Factor
($165/$150)-1=.01

Decoupling Adjustment $15

Fails to Adjust for decrease in Variable Cost of $5

Decoupling – Overall Revenue Approach

What's the Base Period

- Stop again!
- How frequently is this calculation made?
  - Monthly, quarterly, annually
  - Usually monthly

Complications
Periods

- Usually monthly to coincide with billing.
- Which factor is applied to which bill?

Period Mismatches Example

February base is 5.5 units

February consumption was 5 units. Must be calculated in same way base was calculated, e.g., all meters read in month or all bills rendered in month.

Factor is 5.5/5=1.1-1=0.1 (known in March and submitted to PUC for approval)

Apply February factor in April.

- Weather milder – consumption is down
- More days in April than February

Revenues (Base-Actual) that are to be recovered from February shortfall will not be exactly recovered in April

Need a reconciliation mechanism. Reconciliation can be applied to subsequent months. May need to be customer class and tariff component specific.

Complications
Period 2

- Was the bill based upon an actual estimated read?
- Technology to the rescue.
  - AMR technology allows for almost all reads to be actual.
  - Decoupling adjustments probably don't have legs without some type of AMR.

Decoupling – Overall Revenue Approach The Formula

- Adjustment factor=(Base sales/Actual sales)-1
- Base sales and adjustment sales should be clear of any revenues with offsetting costs.
- May need to do this calculation for each rate class.
  - Policy issue of who is getting benefits.
  - More applicable when focusing on rate class specific utility programs rather than all changes in sales.
- May want to look at effect on sales revenues by component (demand and energy charge). Should look at customer charge to reflect changes in number of customers.
- Need to have a reconciliation factor to deal with over and under recovery primarily linked to mismatch of periods.

Decoupling – Overall Revenue Approach The Formula – Part 2

- Adjustment factor=(Base sales/Actual sales)-1
- May be different factor for each class and for each tariff component within the class.
- Multiply factor by base to get adjustment.
- Approach could cause a rate decrease if sales increase within one of these sub-sectors.

Complications
Rate Design

- Rates usually have customer charge and either one or two variable components (demand and energy)
- Most revenues with associated variable offsets are found in energy charge.
- Some may be in demand charge to reflect purchased power demand charges.
- Hopefully, commodity costs, regardless of source, are identifiable.

Posting on Bill

- Adjustments usually need to be listed separately.
- If adjustment is done by tariff component, may need multiple lines on bill to keep calculation transparent.
- Roll-in issue. Will regulators allow this adjustment not to be shown as a line item? Probably not?

Simplified Example Bill

Customer Charge $10		$10.00
Demand Charge $1/kw	2 kW	$2.00
Energy Charge $0.10/kWh	750 kWh	$75.00
Customer Charge Adjustment Base		
99/Actual 100=.99-1 *$10		-$0.10
Demand Charge Adjustment Base		
(150/Actual 125)-1 * $	2	$0.40
Energy Charge Adjustment Base		
5000/Actual 4500=(1.11-1)*$75		$8.25
TOTAL		$95.55

Targeting
Focus on Changes Tied to Utility Programs

- Revenues change for many reasons
  - Weather
    - Supposed to be normalized. Actual may be greater or less than base.
    - Extreme weather may have unexpected costs (storm damage)
  - Economy
    - Supposed to be normal
    - Business cycles affect many businesses
  - Price Elasticity and External Standards
    - Somewhat outside of utility control
    - Price elasticity may be part of a utility program to provide accurate price signals.
  - Utility programs
    - Heart of decoupling
    - Can utility's disinclination to do anything that reduces sales be removed?

Focus on Utility Programs

- Use rather than general approach
- Each Commission approved element of utility's energy efficiency program has a savings estimate attached or a method to generate savings.
- For example: Every refrigerator exchange has a kWh and associated revenue decrease estimate. Large commercial or industrial programs have individual energy savings reports.

Focus on Utility Programs Part 2

- Adjustment of revenues is the aggregation of all savings.
  - Adjustment=loss revenue/adjusted sales
    - Sales are adjusted to reflect decreased sales due to programs.
    - Adjustment is now a $/kWh adder
  - Keep within customer class if costs of programs kept within customer class. Otherwise can be across the board sharing of costs and benefits.

Focus on Utility Programs Part 3

- More up-front work and score keeping involved than general approach.
- May be simpler to apply as it is adding a fixed adjustment rather using factors.
- Requires a commitment to ongoing measurement, monitoring and evaluation, but no different than if decoupling adjustment did not exist.
- Still have issues about timing, class allocation and reconciliation.

Nuances

- Collars:
  - May have maximum range for change through this mechanism, e.g., monthly bill may not be changed by more than 5% (plus or minus)
- ROE Caps
  - Utilities may be required to file statements as part of monthly, quarterly or annual reports to ensure that return on equity allowed in last rate case is not exceeded.
- Null zones
  - May have null zone where nothing happens.
- Sharing
  - Programs are sometimes designed so utility is not made 100% protected from usage variances with some portion allocated to consumers.
  - More applicable to general than target methodology.

Other Methods to Achieve Decoupling

Other Methods at a Glance

- Bonus Return on Equity
  - Grant utility that promotes conservation a bonus return on all rate base or portion of rate base associated with conservation.
- Performance Incentives
  - Establish energy efficiency goals and incentives if achieved.
- Adjustments for Program Costs
  - Instead of giving utilities funds in base rates to spend on something that they may have historically opposed, consider linking additional revenues associated with the costs of these programs to actual implementation.

My Decoupling Secret Weapon

- Decoupling only an issue because fixed charges and profits are being recovered from variable (usage-based) fees.
- Be good economists. Move all fixed costs to a fixed charge (a.k.a. Straight Fixed Variable - SFV).
- SFV can makes conservation less attractive as usage charges are lower.
  - Supplement with zero-sum conservation incentive fee.
  - Customers that use more than a typical range of electricity get charged a premium, and customers that use less get a credit.
- Only possible with AMR.
- Strategy being examined within NRRI.

Q & A