Oakley Greenwood

Network pricing under a revenue cap

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Overview of Presentation

- What was the AER's rationale in shifting to a revenue cap?
- What are the incentives under the new arrangements?
- What approaches may network pricing managers take to maximise profit?
- What will be required from the AER to be effective in reviewing proposed tariffs?
- Has the regulatory burden diminished?
- After the changes - will consumers be better off?

What was the AER's rationale in shifting to a revenue cap?

- The AER's Stage 1 F&A Paper confirms a move to a Revenue Cap for NSW DNSPs
  - Applies to transitional (1 July 2014 to 30 June 2015) and subsequent (1 July 2015 to 30 June 2019) regulatory control periods.
  - It may represent regulatory precedence for other jurisdictions

- The AER's commentary underpinning the change is interesting (p17; p 74, p75):
  - "*WAPC has not, and is unlikely to provide an incentive for distributors to set efficient prices*"
  - "*We therefore considered that a revenue cap will provide benefits in terms of efficient cost recovery and incentives for demand side management*."
  - "*Benefits of a WAPC rest on a theoretical argument that it provides an incentive to set efficient prices. The AER considers the theoretical arguments have not eventuated in practice ….*"
  - "*We consider the benefits of a revenue cap are individual tariff price stability, efficient cost recovery and incentives for demand side management."*

However, does a Revenue Cap really create incentives for efficient pricing?

A brief overview of the WAPC and Revenue Cap..

- Weighted Average Price Cap (WAPC)
  - Entails capping prices based on the weighted average of prices for individual components within a specified basket of services (usually also involves imposing side constraints on individual tariff components/tariffs classes)
  - Actual revenue received from each additional unit sold varies by the actual tariff for that unit
  - DNSP thus subjected to volumetric risk:
    - DNSPs keep any additional profit they make when demand is higher than anticipated, or
    - DNSPs bear the losses when the reverse occurs.
  - Regulatory pressure on demand forecasts is very high in this case, and
  - DNSP's need to be able to accurately forecast demand at the tariff component level
- Revenue Cap
  - Places a cap on the overall revenue that a regulated business is able to earn in any one year
  - If actual revenue > allowed revenue, the business has to "give back" that revenue to customers in the following years via the adoption of lower prices
  - If actual revenue < allowed revenue, business can increase prices in the following year/s to recoup that under-recovery of revenue
  - Some form of smoothing system (and rebalancing constraint) is typically used to mitigate price gyrations.

Who bears volumetric risk is the fundamental difference between a Revenue Cap and WAPC?

- Revenue cap
  - NPV of actual revenues derived by a business IS NOT impacted by the volume sold, therefore customers bear volumetric risk
  - A DNSP's costs (and therefore profit) will, however, be partially driven by the volume of "cost drivers" consumed (e.g., peak demand, energy at risk, kWh)

- WAPC
  - NPV of actual revenues derived by a business IS impacted by the volume sold – and not just gross volume but volume at the tariff component level and the prices applied
  - A business' cost will in part, be driven by the volume sold, however the impact that volumes have on profit will be dependent on the cost-reflectivity of its tariffs, and also, the time-period underpinning that measure (e.g., SRMC versus LRMC)

Only the 'cost reflectiveness' of tariffs under WAPC has been disputed by the AER, based on their view of the empirical evidence...

How does the NEO and economic theory guide us when it comes to network pricing?

- National Electricity Objective (NEO):
  - "*To promote efficient investment in, and efficient operation and use of, electricity services for the long term interests of consumers of electricity with respect to ….[emphasis added]*"
  - 'Promote efficient use of' (allocative efficiency) requires tariffs for services (and service attributes) to be reflective of future costs so that:
    - The right amount of consumption occurs (consumers will only consume up to the point where the marginal benefit to them equals the marginal cost to society of providing that service); and
    - The right mix of services (or service levels/attributes) is provided to customers (the mix that maximises economic welfare).

- Economic theory would also suggest that:
  - As price increases, demand decreases (a downward sloping demand curve)……sound familiar?
  - Therefore, if prices reflect cost *drivers*, then *total* costs will also decrease as prices increase.

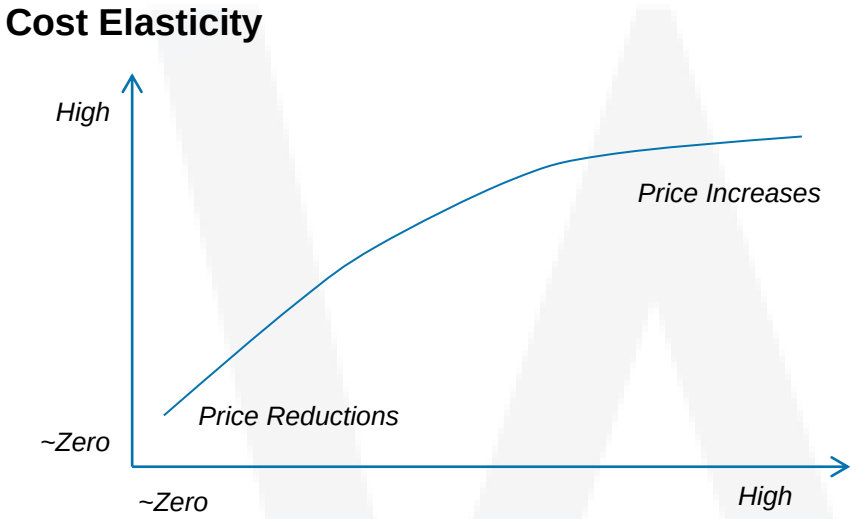
How would a profit maximising business set prices under a Revenue Cap?

- So if a business' costs decrease, as prices increase:
  - Price structure / levels represent a key means by which a business can drive down its costs;
  - However, price structure / levels *do not impact* upon a business' revenues (in NPV terms) under a Revenue Cap
  - Therefore, under a Revenue Cap, a business has a 'super-charged' incentive to use price to reduce its costs, as anything that reduces costs flows directly through to profit (Revenue is capped, profits aren't).
  - This is further reinforced by the fact that businesses are fully exposed to cost risk, relative to regulatory benchmark levels (any increase in demand for services that leads to increased costs will not lead to increased revenue, as happens under the WAPC in theory)

Therefore, a Revenue Cap:
- **Fixes revenues, but not costs (therefore profits)…AND**
- **Prices can influence costs (therefore profits) , but not revenue…**

How would a profit maximising business set prices under a Revenue Cap (cont'd)?

- Businesses would maximise profits by:
  - Increasing price on 'products' that have the **highest 'price elasticity' of demand**, and decreasing price on products that have the lowest price elasticity of demand (opposite of Ramsay Pricing concept!).
    - This seeks to maximise the impact that the overall price change has on reducing demand..
  - Increasing price on the 'products' that have the **highest 'cost elasticity'** (i.e., impact that a change in quantity has on the cost function), and decreasing prices on those that have the lowest cost elasticity.
    - This seeks to maximise the impact that the overall price change has on a business' underlying total costs.



- **High price elasticity / high cost elasticity products represent the "sweet spot" for targeting price increases..**

What types of changes might a profit maximising business make to its tariffs under a Revenue Cap?

- For large customers, a profit maximising DNSP may:
  - Move away from fixed charges…Why?
    - It has a zero price elasticity of demand (assuming pricing between standalone and avoidable cost);
    - It has a zero cost elasticity of demand (as per above caveat).
  - Move away from energy (kWH) charges…Why?
    - It has a very low cost elasticity
  - Move away from anytime maximum demand charges…Why?
    - It is likely to have a lower price elasticity of demand (than a critical peak demand charge); and
    - It has a lower cost elasticity of demand (than a critical peak demand charge).
  - Move towards some form of coincident peak or critical peak demand charging arrangement, differentiated by customer type…Why?
    - A CPD is likely to have a higher price elasticity of demand (than an 'anytime' peak demand charge);
    - A CPD has a much higher cost elasticity of demand (than an 'anytime' maximum demand charge); and
    - Charging higher prices to customer's that have higher elasticity of demands (irrespective of their cost to serve) maximises the overall impact that a price change has on demand.

What types of changes might a profit maximising business make to its tariffs under a Revenue Cap (cont'd)?

- For smaller customers, metrology will be a key driver:
  - Accumulation meters:
    - Move away from fixed charges,
    - Move towards energy based charges (with potential focus on structures such as IBT's or seasonal tariffs that may in part, be seen to be able to impact on demand) and/or
    - There are incentives to potentially move towards some 'aggregated demand' based charge being sent to retailers.
  - AMI meters:
    - Move away from fixed charges
    - Move away from flat energy charges
    - Move towards ToU, Coincident Peak Demand or CPD tariffs
      - Which one, depends on elasticity of demand, the administrative costs and the cost elasticity etc.)

AMI meters may lead to network businesses providing a menu of tariffs, so that customers "self select" based on their ability to respond to that price signal:
- **This implicitly reveals their price elasticity of demand, which should maximise the overall impact that price has on demand (and therefore costs); and**
- **There is no downside risk to the business in terms of NPV of revenue.**

So what is wrong with these outcomes??

- Some might say nothing!!
- Actually, it could be argued that a Revenue Cap 'super-charges' business' incentive to focus its price structures on reflecting its key cost drivers
  - In some cases, it may result in a move towards cost reflective price structures (see move to CPD for large customers).
- However, the above will not apply in all cases (see residential example, with no AMI meter), and moreover, the downside is not just price *structure*, but rather price *levels*…..
- Why price levels?
  - Revenue Cap **encourages price levels that deviate from efficient levels**, so as to maximise the impact that that price has on demand for the service being charged (and therefore profit maximisation).
  - This has significant implications for allocative efficiency, and therefore, the ability for NEO objectives to be met ('promote efficient investment in, and *use of*…")

In short, this could result in DBs pricing some services at artificially high levels to increase their profits at the expense of productive activities in the economy at large and greater comfort and convenience for households – which is contra to the NEO!

There are three constraints that may partially mitigate the downside impacts of a Revenue Cap…

- Rebalancing constraints
  - The AER will rely on rebalancing constraints at the tariff class/tariff component level within period
  - However constraints generally do not apply in year 1 of regulatory period, so what happens then??
  - Difficult to implement within period, given volatility in overall price changes year-on-year (e.g., over-recovery in previous year leads to price reductions in following year; how will the AER ensure that the required price reductions are allocated efficiently across hundreds of tariff components)..

- AER's scrutiny of pricing proposals
  - Consistent with above, the AER will have to more heavily scrutinise businesses annual pricing proposals to assess their compliance with the NERs as:
    - It can't rely on "theoretical" incentives of WAPC
    - It needs to protect against "real" incentives under the Revenue Cap to deviate from/exceed cost reflective price levels
  - For example, it will need to:
    - Thoroughly review cost modelling (SRMC; LRMC) provided by businesses as justification for their proposed price levels/structures – annually...
    - Have a robust understanding of cost drivers, pricing theory etc.
    - They are likely to have a much bigger role than under a WAPC *within* period

There are three constraints that may partially mitigate the downside impacts of a Revenue Cap (cont'd)…

- Cashflow versus NPV…..
  - NPV of revenue is not impacted by timing/amount of sales….*however*
  - A business that is cashflow constrained (e.g., nearing its credit metrics) may be more concerned about cashflow implications of lost revenue in near term, than profit maximisation benefits in longer term (which may temper desire to ration demand through price).

Will these constraints “be enough”???

- In short, we suspect it will be fraught….
  - Are the resourcing levels and existing skill base of AER set up for this role (can they review ~15 DNSPs x lots of tariffs per year??)
  - Asymmetry of information between business and AER (re: costs/demand forecasts; elasticities – a thoroughly unresearched area in Australia)
  - Cannot rely on benchmarking of price levels across businesses, as LRMC is materially affected by business specific characteristics (e.g., existing level of spare capacity; marginal cost of future augmentations; demand forecasts); and
  - Cashflow issues unlikely to be a big enough impediment to most businesses seeking to profit maximise.

- Therefore, the AER is unlikely to be able to cope with the burden sufficiently to enable it to provide the scrutiny and exercise the controls that would be needed to overcome the inherent risks – unless there is a very large lift in resource capability

Will consumers benefit?

- If profit maximising behaviour is deployed by DNSP's successfully, this might not be the case….
  - Pricing above efficient levels imposes an economic cost (a loss in allocative efficiency)
    - Detrimental to affected consumers
    - Detrimental to the economy as a whole
    - Inconsistent with the NEO.
  - It may necessitate more detailed, resource intensive, customer involvement during the annual pricing process, as particular customer groups' seek to protect their interests
    - This may be even more challenging than the present arrangements for consumers, as the debate will shift to DB costs which will be very difficult for consumers to provide informed comment about
  - Potential for increased volatility in pricing outcomes (e.g., year-on-year fluctuations in individual tariff components) that generally stem from adopting a Revenue Cap (although depends on smoothing mechanisms, and rebalancing constraints)
    - Possibly further exacerbated by changes to tariff structures incentivised under the Revenue Cap.

It is not clear what benefits customers will see exactly….

Conclusion…

- A profit maximising firm will, if faced with a Revenue Cap:
  - Seek to ration demand via price – via the adoption of prices that exceed what would otherwise be considered efficient levels;
  - Specifically, they will:
    - Increase the price of 'products' that have the highest price elasticity of demand to maximise the impact that any price increase has on demand
    - Increase the price of 'products' that have the highest 'cost elasticity' to maximise the impact that price increases have on a business' underlying costs.
- A Revenue Cap increases the regulatory burden, as the AER will have to more heavily scrutinise business' annual pricing proposals for compliance with the NERs
- It is highly doubtful whether the constraints placed upon businesses will "be enough" to reduce the incentives for profit maximising businesses to adopt prices that are inconsistent with efficient levels
- It may necessitate much more customer involvement, as certain customer groups seek to ensure their interests are protected
- It is not clear that consumers will benefit from the adoption of a Revenue Cap, relative to the retention of a WAPC – it will be swapping one form of behaviour for another as the incentives change - and transferring significant risks.

"If you look like you are broken someone will fix you..."

Thank you

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