Should Customer-Owned [i.e. "Public"] Monopolies face Different Regulation to Investor-Owned Firms?

Dr Richard Meade
Cognitus Economic Insight® & Auckland University of Technology
richard.meade@cognitus.co.nz
www.cognitus.co.nz

MBIE Webinar

30 August 2021

cognitus

Introduction – Backstory

- Been thinking about distribution sector problems since acting on lines company mergers in mid 1990s
- Before undertaking my PhD, researched electricity sector problems while at the New Zealand Institute for the Study of Competition and Regulation (ISCR):
  - Wrote on the (de)merits of regulating customer-owned lines companies
  - With Lew Evans, co-authored "Alternating Currents or Counter-Revolution?" on New Zealand's electricity reforms ...

Backstory (cont'd)

cognitus

Backstory (cont'd)

- Presentation based on one of my four thesis papers at Toulouse School of Economics (for a policy audience!):
  - *Theory* of how to regulate monopolies, with different ownership types, when regulator cares about both:
    - Efficiency – i.e. low operating costs; and
    - Quality – e.g. high reliability;
- A companion thesis paper provides *evidence* on New Zealand Electricity distributor performance
- Currently extending the analysis so it can be taken to Swedish electricity distribution data (with Magnus Söderberg, University of Gothenburg)

Focus of Presentation

- Electricity distribution
- Analysis applies to other monopolies where both quality and efficiency matter:
  - Gas distribution
  - Water distribution
  - Wastewater services
- Contrast customer ownership with investor ownership:
  - Can think of council ownership ("municipals") as intermediate case
- Ideas find application in other sectors – e.g. hospitals, broadcasting, ISPs, education, housing ...

Focus of Presentation (cont'd) – Digression

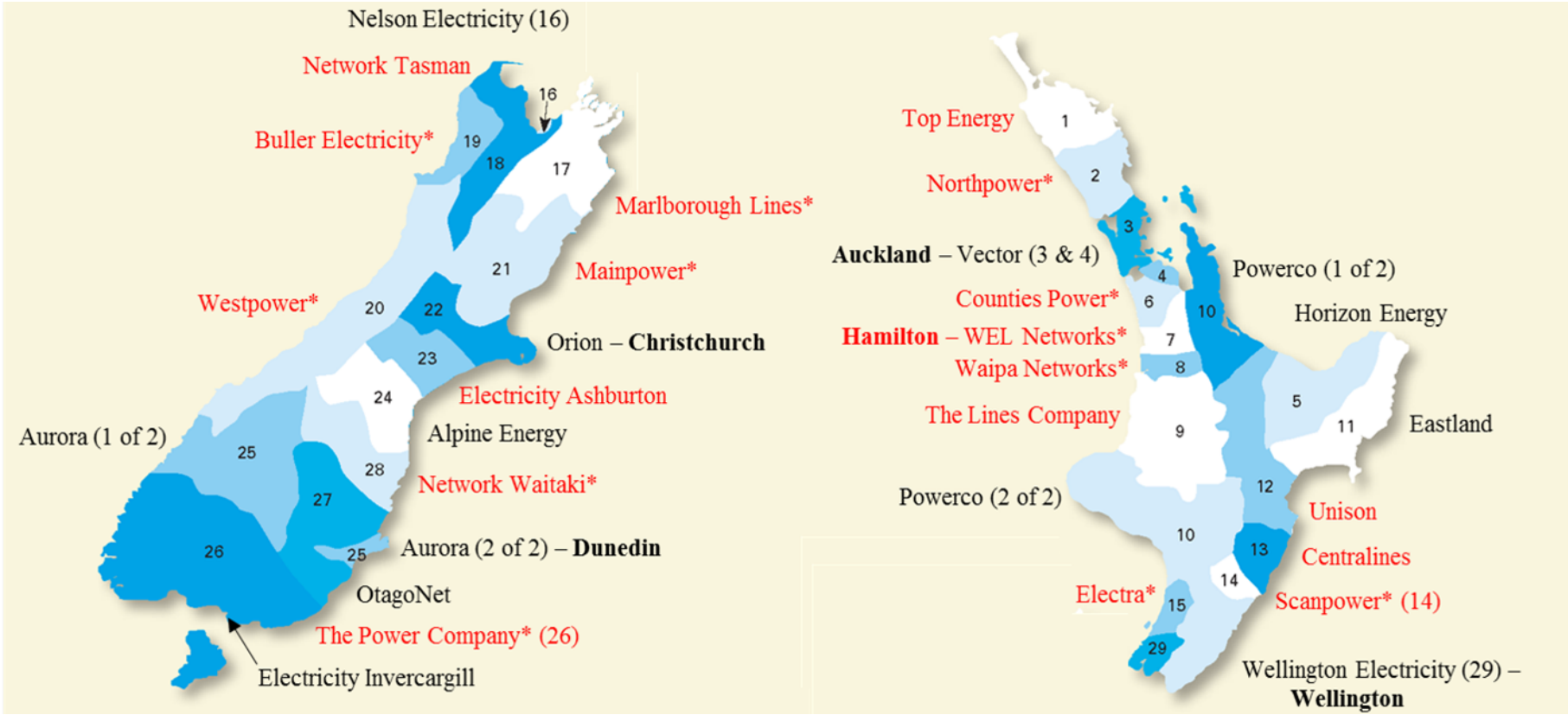
Kidicorp, a leading ECE provider to go non-profit
NZH, Friday 27 March 2015

...
"Profit and returns have never been a priority for us, so this seemed to be the natural and right thing to do."
...
Mr Wright said in the statement that although Kidicorp would have presented significant value to outside investors, they wanted to protect the quality features built up over the years.

Renters pay landlords £5.6bn every year to live in homes that can make them sick or kill them
The Independent, Thursday 21 May 2015

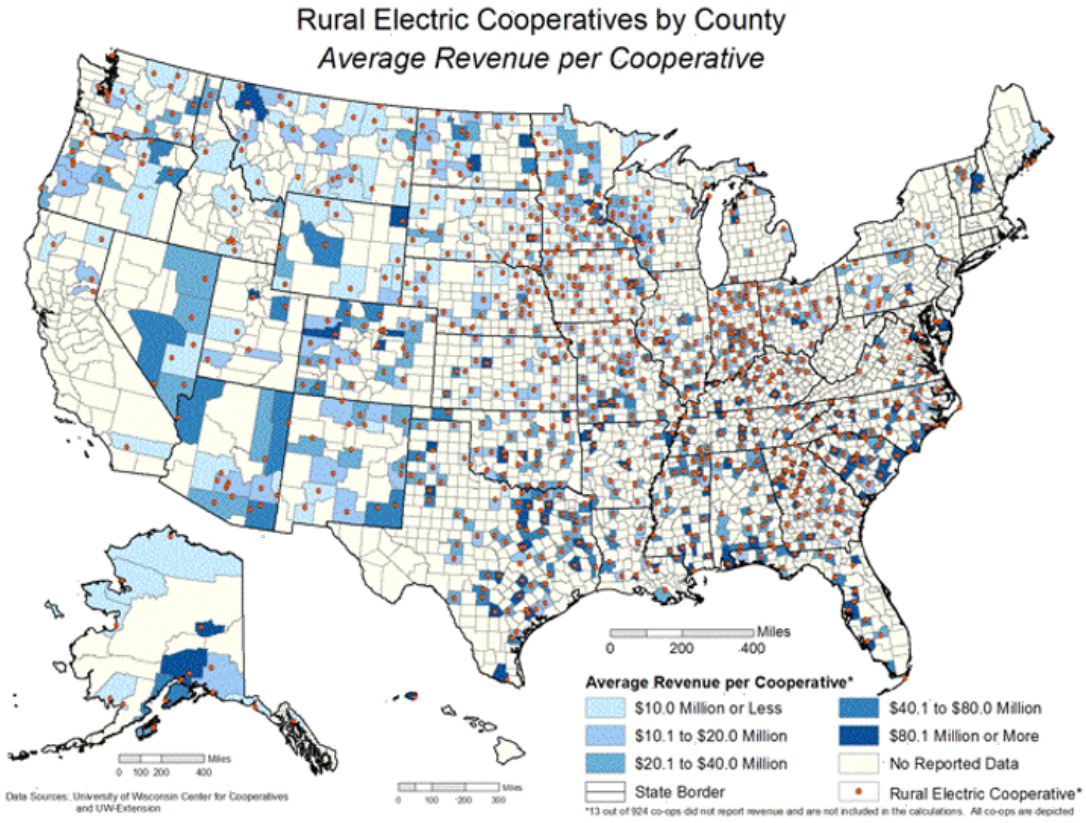
Tenants are forced to give landlords £5.6bn a year to live in unsafe homes which do not meet legal standards, according to a new study.
...
Sixteen per cent of all privately rented homes were found to physically unsafe, compared to just six per cent in the socially rented sector.

Customer Ownership (Red) and Regulation Exemption (*) in New Zealand Electricity Distribution



cognitus

Prevalence of Customer Ownership – US RECs



47 states, networks over 75% of US, 43% of distribution lines
Distribute US$600m "dividends" to customer owners annually

cognitus

Prevalence of Customer Ownership (cont'd)

- Other US customer-owned utilities:
  - Rural telecommunications – 260 customer-owned firms with networks over 40% of US
  - Rural water services – 3,300 customer-owned firms
- Non-US utilities with significant customer ownership:
  - Electricity distribution:
    - OECD – Sweden, Italy and Spain; Chile; New Zealand;
    - Non-OECD – Argentina, Bolivia, Brazil, and Costa Rica; India, the Philippines and Bangladesh; Kenya;
  - Rural irrigation schemes – Australia, New Zealand
  - Finland – 938 water cooperatives, and 74 energy cooperatives

Diversity of Regulatory Treatments

- 12 of New Zealand's 18 customer-owned lines companies meet strict thresholds for regulatory exemption – 17 of 29 companies regulated, 6 of which are customer-owned
- US customer-owned utilities often regarded as self-regulating, and exempted from price regulations:
  - But RECs are price-regulated in 16 of 47 states
  - Some customer-owned telecommunications firms also regulated
- **Begs question** – should customer-owned monopolies be regulated the same as, or differently to, comparable investor-owned firms (if at all)?

Issues – Regulators Face Quality-Efficiency Trade-Off

- "Incentive regulation" well-established as leading approach for regulating distribution monopolies:
  - E.g. $CPI - X$ "caps" on maximum allowed revenues (or prices):
    - Allow firm's revenues to grow by X less than CPI (in %)
    - Forces firm to find cost-savings of at least X (% of revenues) to maintain/grow inflation-adjusted profits
  - X therefore intended to **induce** *efficiency* when firm has (takes) **hidden information (actions)**
- But – well-recognised trade-off between efficiency and *quality*:

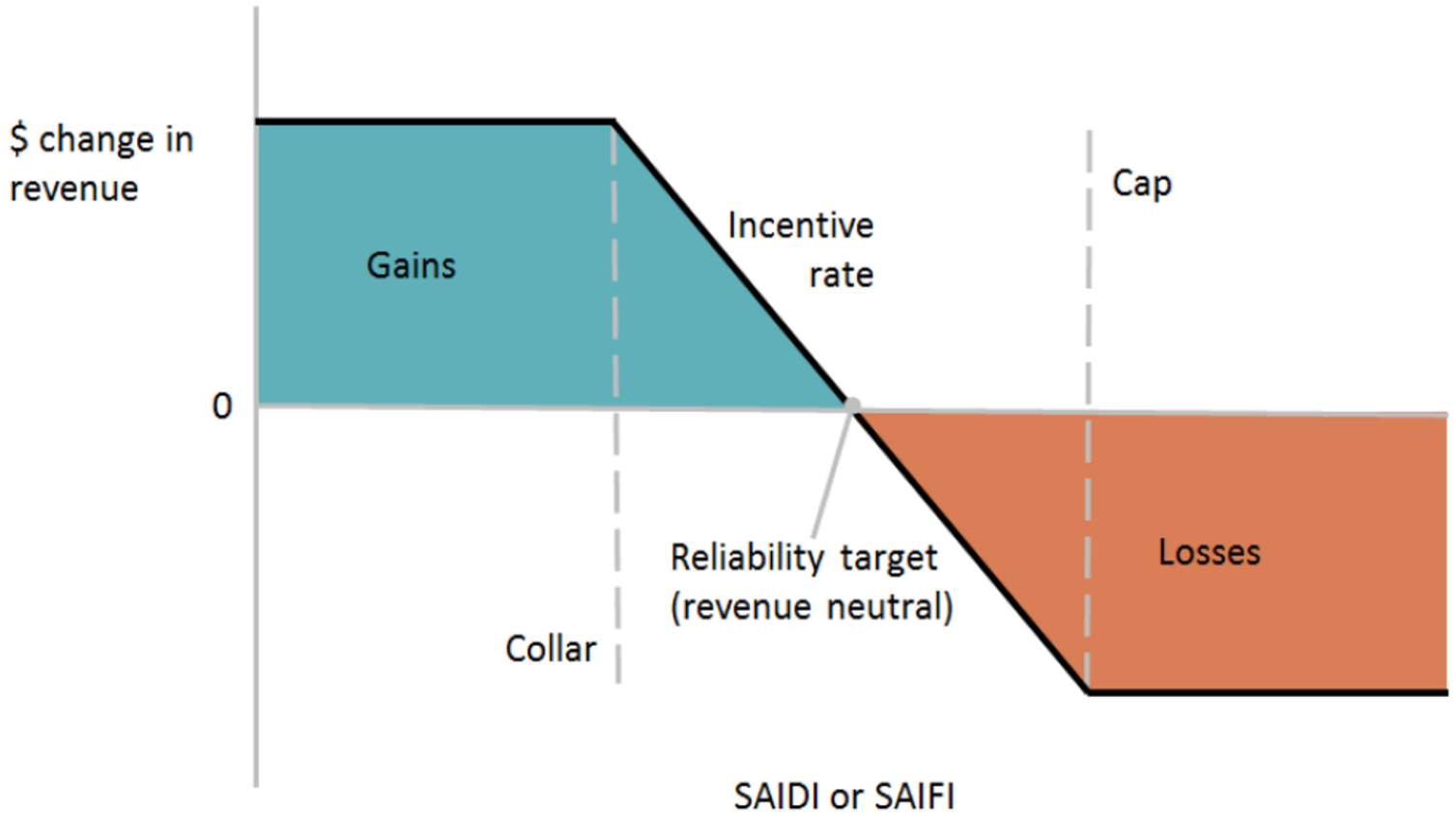
  "Clearly if a regulatory mechanism focuses only on reducing costs and ignores quality it will lead [a] firm to provide too little quality." (Joskow (2006))

Regulators Face Quality-Efficiency Trade-Off (cont'd)

- In electricity distribution, for example, sacrifice reliability while reducing operating costs by:
  - Sacking half the lines repair crew
  - Repairing faults only slowly or incompletely
  - Building networks that are cheap to run but prone to outages
- Regulators have wised up – use incentives and/or penalties for deviations from quality targets:
  - E.g. $CPI - X + Q$, where Q is reward for beating quality target (or penalty for falling short)
  - Applied in UK, Italy, Netherlands, Norway, Sweden, Israel, parts of the US, Australia ...

NZ's Latest Approach – Quality Incentive Scheme ("*Q*")

Figure 6.1: Stylised chart of the revenue-linked incentive scheme



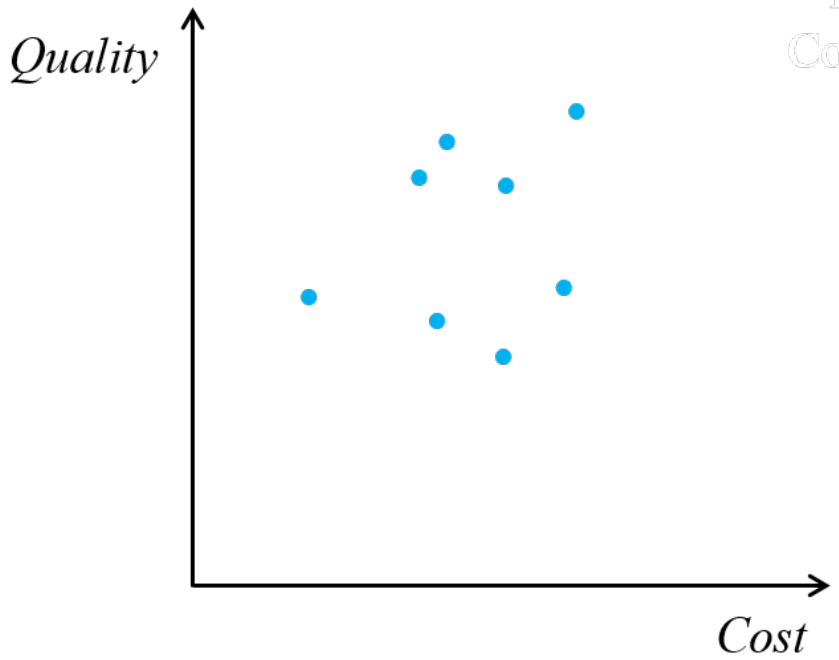
Source: Commerce Commission (2014)

cognitus

Remaining Issues – For Regulators Worldwide!

- What is the right quality target?
  - Is reliability (e.g. SAIDI, SAIFI) the right/only measure?
  - Is history the right place to start? – e.g. engineers' "$n-1$"?
  - Have consumers' willingness to pay (WTP) for quality, and the costs of providing it, even been measured?
  - Modern theory of regulation is surprisingly quiet on how to **induce** desired quality ...
- Are incentives:
  - Proportionate to consumer gains/losses?
  - Appropriate for each customer type?
- *How should quality and efficiency be traded off?* ...

Quality-Efficiency Trade-Off

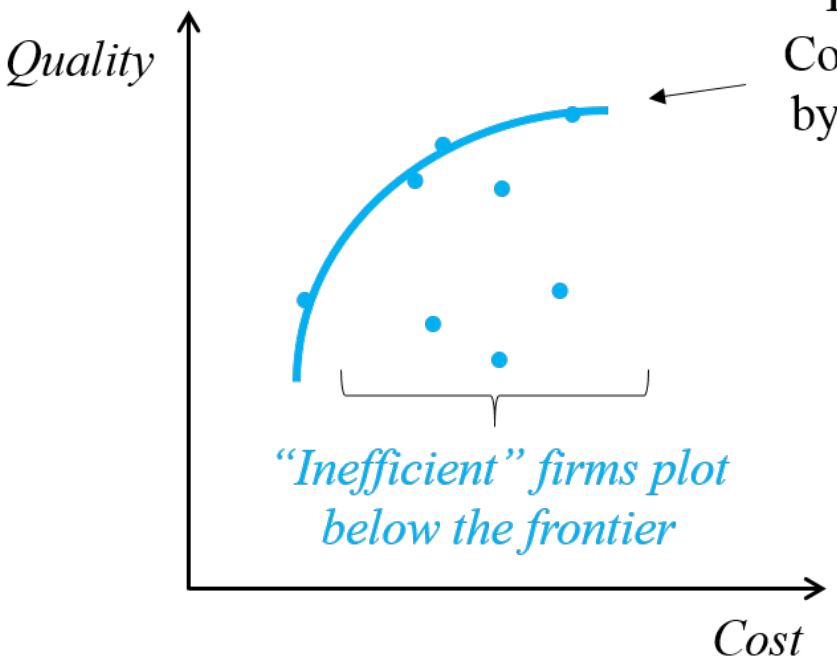


"Efficient Frontier" – defined by the Cost/Quality* trade-offs demonstrated by the best firms, controlling for relevant firm differences

* Or Price/Quality, or Price-Cost Margin/Quality, ...

cognitus

Quality-Efficiency Trade-Off

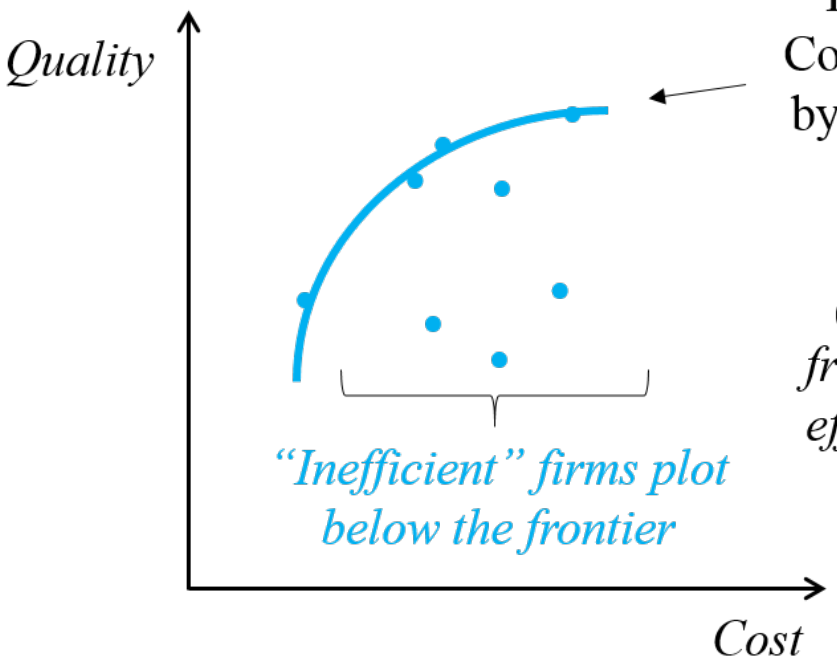


"Efficient Frontier" – defined by the Cost/Quality* trade-offs demonstrated by the best firms, after controlling for relevant firm differences

* Or Price/Quality, or Price-Cost Margin/Quality, …

cognitus

Quality-Efficiency Trade-Off



"Efficient Frontier" – defined by the Cost/Quality* trade-offs demonstrated by the best firms, after controlling for relevant firm differences

(Separate question – are even the frontier firms producing the quality-efficiency trade-offs desired by their customers? ...)

* Or Price/Quality, or Price-Cost Margin/Quality, …

cognitus

Finally – This Presentation's Topic!

- Implicit assumption so far – regulated firms are *investor*-owned and maximise profits
- Reality – many regulated firms are *customer*-owned (a.k.a. "consumer cooperatives"):
  - Care about *consumer welfare* (including from quality) as well as profits
  - Governed by representatives elected by customers
  - Recycle profits back to customers, in proportion to usage – hence regulatory exemptions ...
- *So, how does customer ownership affect the quality-efficiency tradeoff – and hence optimal regulation – when the regulator can only* ***induce*** *firm managers to deliver quality and efficiency?*

Examples re Objectives and Trade-Offs

- Unison – its owner encourages:
  - Rural network investment – unprofitable service delivery
  - Undergrounding in Hastings and Napier – costly safety, visual amenity and reliability
  - Energy efficiency and conservation projects – demand-*reducing* environmental quality
- Other owners explicitly influence quality-*price* trade-off:
  - E.g. Network Waitaki, Counties Power
  - Since firms must at least break even (i.e. unit costs shouldn't exceed prices), equivalent to quality-*cost* trade-off

Approach

- "Standard" theory of incentive regulation:
  - Assumes a monopoly maximises *profits* – i.e. implicitly, that it is investor owned
  - Since ownership is implicit, owners not distinct from managers
  - Typically considers **hidden information/actions** affecting efficiency only

Approach (cont'd)

- I push the standard theory in two new directions:
  - Separate owners from managers – can then allow for different types of owners
  - Allow the manager to take **hidden actions** affecting each of quality and efficiency
- First to consider optimal regulation under customer ownership with "multi-tasking moral hazard"

Setting

- Customers care about both price and quality
- Manager exerts efforts on both cost savings and quality enhancement
- Quality increases demand, revenue and consumer welfare, but not necessarily profits
- Customer owners care about profits, but also consumer welfare
- Owners provide performance incentives to the manager through profit-sharing (e.g. a bonus)

Setting (cont'd) – The Regulator's Challenge(s)

- The regulator wants to know:
  - How to regulate prices (I allow for X in $CPI - X$, but not a separate Q) ...
  - In a way that induces the firm's owners to set the manager's incentives/profit share ...
  - In a way that induces the manager to take **hidden actions** ...
  - In a way that delivers the regulator's preferred mix of efficiency and quality

Findings – Manager's Decisions

- Manager chooses cost-reducing and quality-enhancing efforts to maximise expected bonus:
  - Net of private effort costs, and allowing for risk
- Find the manager can face a *conflict between pursuing efficiency and quality*:
  - Efficiency increases profits and hence bonus – *higher profit share encourages efficiency*
  - Quality can increase costs more than revenues:
    - Quality decreases profits and hence bonus – *higher profit share discourages quality*

Owners' Decisions

- Owners anticipate the manager's conflict between efficiency and quality when choosing profit share
- Investor owners like profits, so they want to induce high efficiency and low quality:
  - They opt for a *higher* manager's profit share – i.e. "strong incentives"
- Customer owners care about customer welfare as well as profits:
  - So they want to induce more quality, but can live with less efficiency, than investor owners:
    - They opt for a *lower* manager's profit share – i.e. "weak incentives"

Regulators' Decision

- Regulator anticipates:
  - The different incentive powers chosen by each owner type
  - The impact of these incentive power choices on the manager's quality and efficiency choices
- Regulator chooses the firm's regulated price – i.e. its "X" in $CPI - X$, a.k.a. its "price cap"

Regulators' Decision (cont'd)

- Regulator assumed to choose the price (cap) to maximise a *weighted average* of consumer welfare and profits:
  - Weights could reflect regulatory bias, or external costs or benefits of supply or consumption, etc
  - If weights are same as customer owners', then regulator chooses same price as customer owners would:
    - Regulatory exemption clearly appropriate in that case

Regulators' Decision (cont'd)

- Suppose increasing price hurts consumers *less* than it helps weighted profits (relatively speaking):
  - Regulator chooses *higher price for customer-owned firm* relative to investor-owned firm:
    - I.e. smaller "X", or *looser price cap*
    - Regulatory exemption more defensible in that case
- But if increasing price hurts consumers *more* than than it helps weighted profits (again, relatively speaking):
  - The *customer-owned firm should face a relatively lower regulated price (i.e. tighter price cap)!*
  - Regulatory exemption warrants a second look in that case

Discussion

- Main finding – in general, *customer-owned monopolies should be regulated differently* to investor-owned firms:
  - Regulatory exemption warranted in certain cases
- Important extra finding is that *ownership form changes how the regulator can influence the manager*:
  - Different incentive power chosen by each owner type
  - Also, the way that investor owners choose incentive power means the regulator can't use price to influence incentives – unlike for customer owners

Discussion (cont'd)

- Analyisis is general, so further work required to make clear predictions about quality-efficiency trade-offs under each ownership type in specific situations
- However, analysis does suggest a *general test for determining whether customer-owned firms should be regulated*:
  - Sufficient to show inverse relationship between customer owners' chosen incentive power and regulated price – work in progress ...

Other "To Do's"

- Add "Q" so that regulator has more than one instrument
- Identify the "efficient frontier" of quality-efficiency points for each firm type:
  - Provides one part of a screen for determining which firms warrant regulatory attention
- Further identify whether even frontier firms are delivering their customers' preferred quality-efficiency trade-off
  - Provides the other part of the screen
  - Requires quantification of consumers' preferences
- Develop tools to help regulators shift firms to the appropriate position on the frontier

***