University of
South Australia

Customer acceptability, customer preferences and social license to operate: what does all this mean for the water sector?

Bethany Cooper[1,2], Dan Rigby[3], Lin Crase[2], Saeideh Khosroshahi[4], & Marcus Crudden[4]

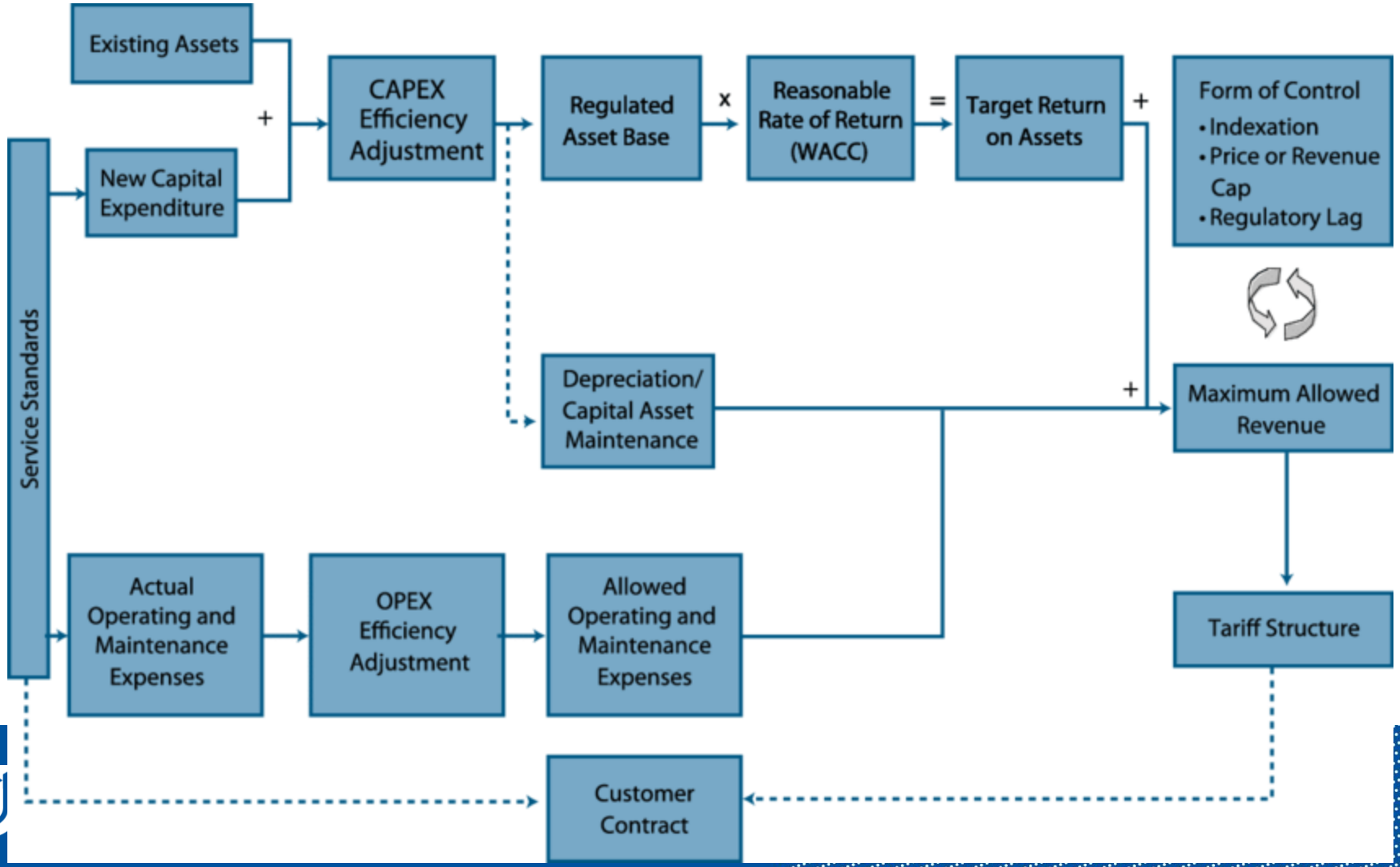
[1.] ARC Industry Fellow [2.] UniSA [3.] University of Manchester [4.] ESC

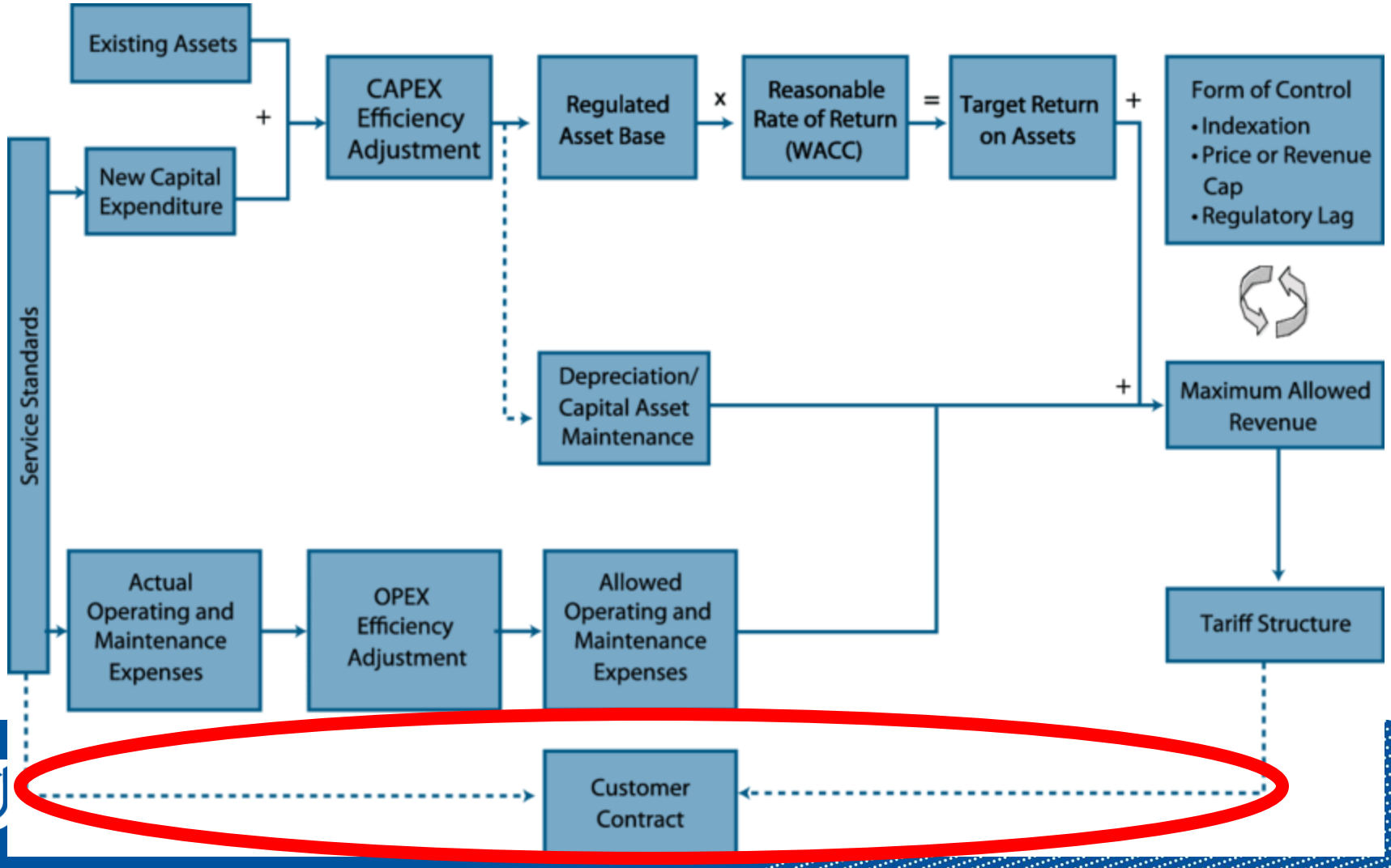
Outline

- Positioning economic regulation, water utilities and customer preferences
- Examples that challenge next water solutions
  - Potable water quality
  - Diffuse pollutants in reclaimed water
- Implications

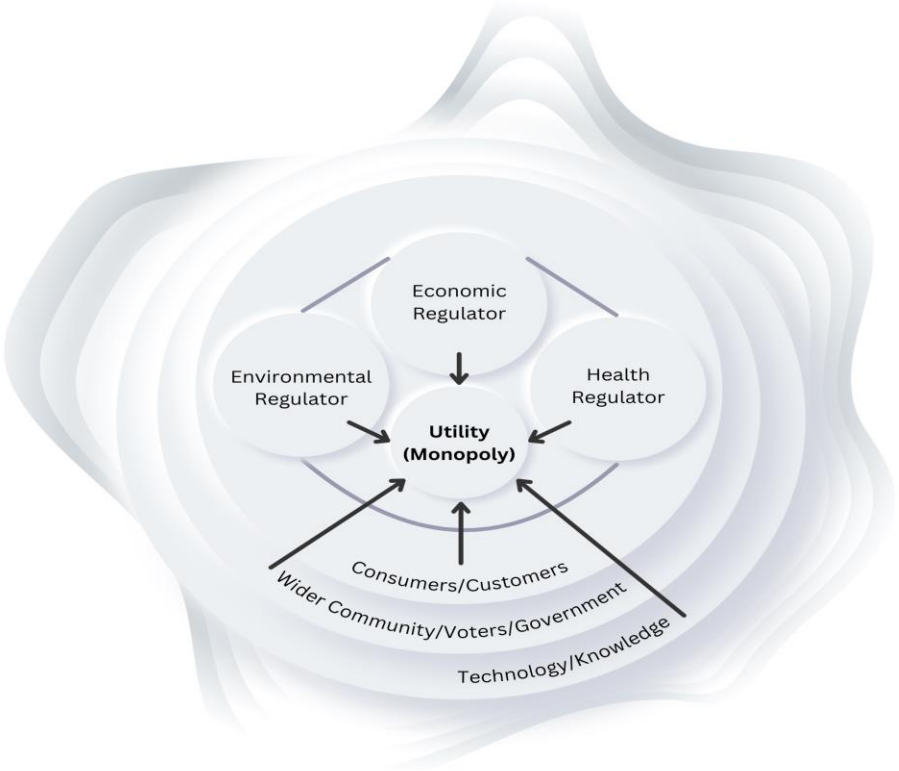
Economic regulation of water services in Australia

- 20+ year history, arguably more advanced in some states
- Focus on pricing – meeting service standards (including health and environmental expectations) at minimum cost
- Assumes relatively stable and known customer preferences that align with either the plans of the utility or regulator's expectations or both


Existing Assets
+
New Capital Expenditure
CAPEX Efficiency Adjustment
Regulated Asset Base
x
Reasonable Rate of Return (WACC)
=
Target Return on Assets
+
Form of Control
• Indexation
• Price or Revenue Cap
• Regulatory Lag
Service Standards
Depreciation/ Capital Asset Maintenance
+
Maximum Allowed Revenue
Actual Operating and Maintenance Expenses
OPEX Efficiency Adjustment
Allowed Operating and Maintenance Expenses
Tariff Structure
Customer Contract


Existing Assets
+
New Capital Expenditure
CAPEX Efficiency Adjustment
Regulated Asset Base
x
Reasonable Rate of Return (WACC)
=
Target Return on Assets
+
Form of Control
• Indexation
• Price or Revenue Cap
• Regulatory Lag
Service Standards
Depreciation/ Capital Asset Maintenance
+
Maximum Allowed Revenue
Actual Operating and Maintenance Expenses
OPEX Efficiency Adjustment
Allowed Operating and Maintenance Expenses
Tariff Structure
Customer Contract

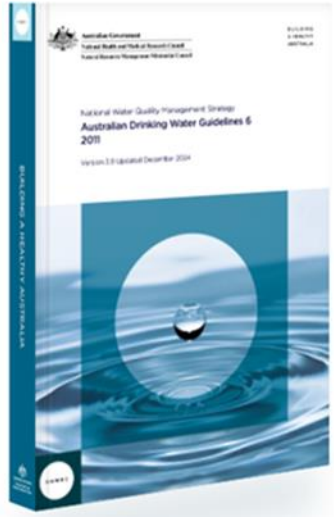
Where’s the customer now?



University of South Australia

Case One: Customer preferences around potable water quality

Background



- The Productivity Commission 2024 review of the NWI recommends updating the NWI and including **universal access to safe and reliable drinking water**
- In some cases there is heavy reliance on groundwater where **total dissolved solids (TDS)** influences *taste* and *acceptability*
- **Australian Drinking Water Guidelines** provide the minimum requirements for drinking water of good quality
- **Aesthetics targets** depend on public expectations
  - **600 TDS mg/L** regarded as ‘good’ quality drinking water
- **Should economic regulator simply defer to guidelines?**

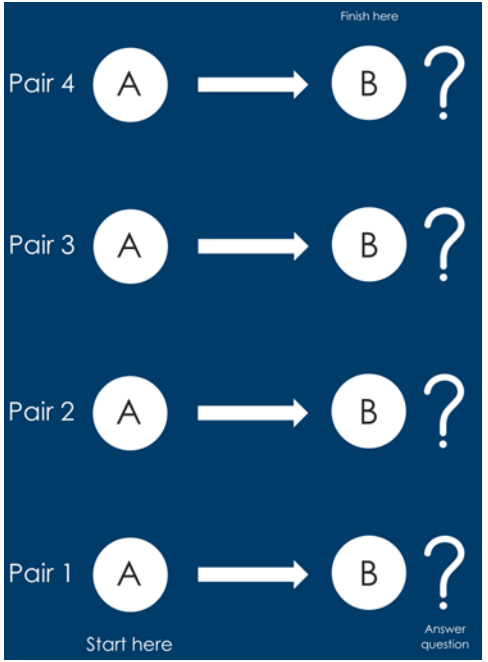
A Non-Hypothetical Choice Experiment

Research Questions

- Can customers detect a change in the taste of drinking water when a paired comparison method is deployed and is it statistically identifiable?
- Are there differences in the perceived taste of drinking water between rural and metropolitan water consumers?
- Is it possible to identify a threshold of (un)acceptability for customers?

Experiment Design

- **Extensive pre-testing**
  - E.g. how many water samples can be in a set (2); how many pairs can participants handle (4); rinsing in-between tasting
- Levels based on guidelines, literature & pre-testing
  - 200 TDS; 300 TDS; 400 TDS; 500 TDS; 600 TDS; 700 TDS
- Experimental design - 24 pairs
  - 6 design blocks/versions
  - Each participant - 4 pairs of water samples to taste



Survey Administration

- Survey - Sawtooth software, in-person survey, via tablets
- ‘Real’ water samples
- ‘Walk-through’ populations in office blocks, university campuses, shopping malls, rural field days
- Sample: Metro and Rural

Choice Set

Which one of these 2 waters do you prefer?

(If you don't like either one very much just tell us which you like best (i.e. dislike the least)

(Pair 1 of 4)

	Preferred Water
Water A	○
Water B	○

Anchoring and Threshold

- Follow Up question after each set:

Thinking about the two waters you have just tasted, would you drink the one you *preferred* as your usual drinking water?

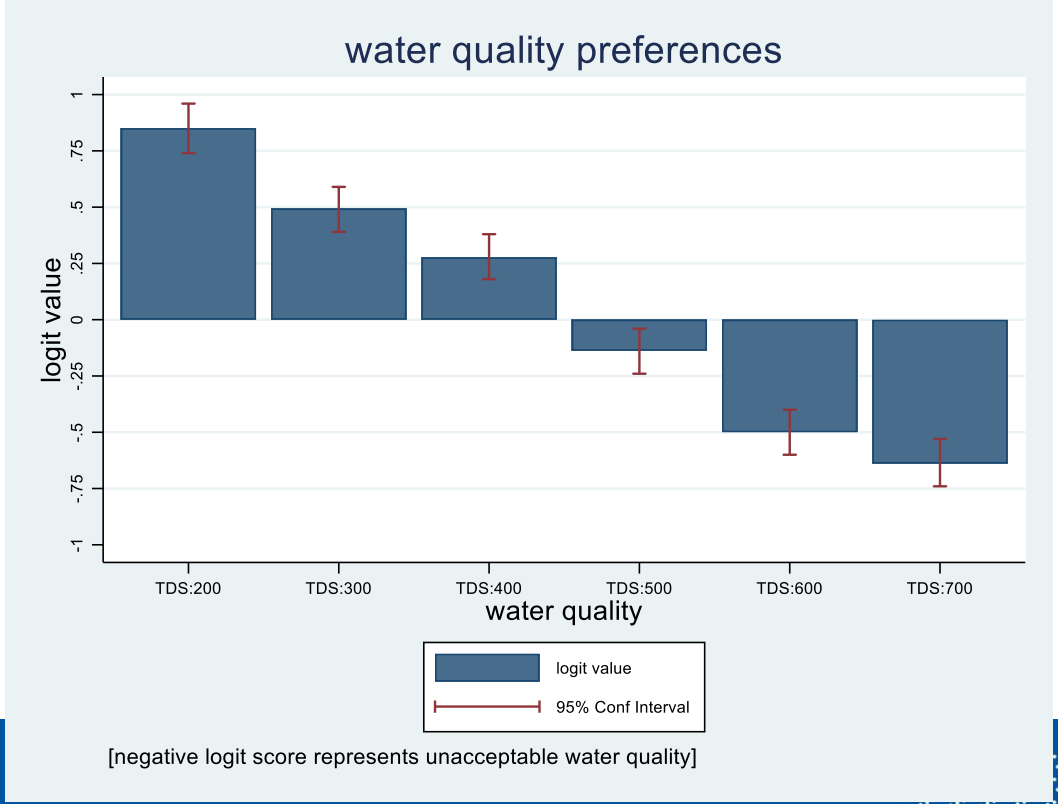
- ◯ Yes
- ◯ No

- If they say YES, we also need to ask:

Would you drink the other, *LESS PREFERRED*, water as your usual drinking water?

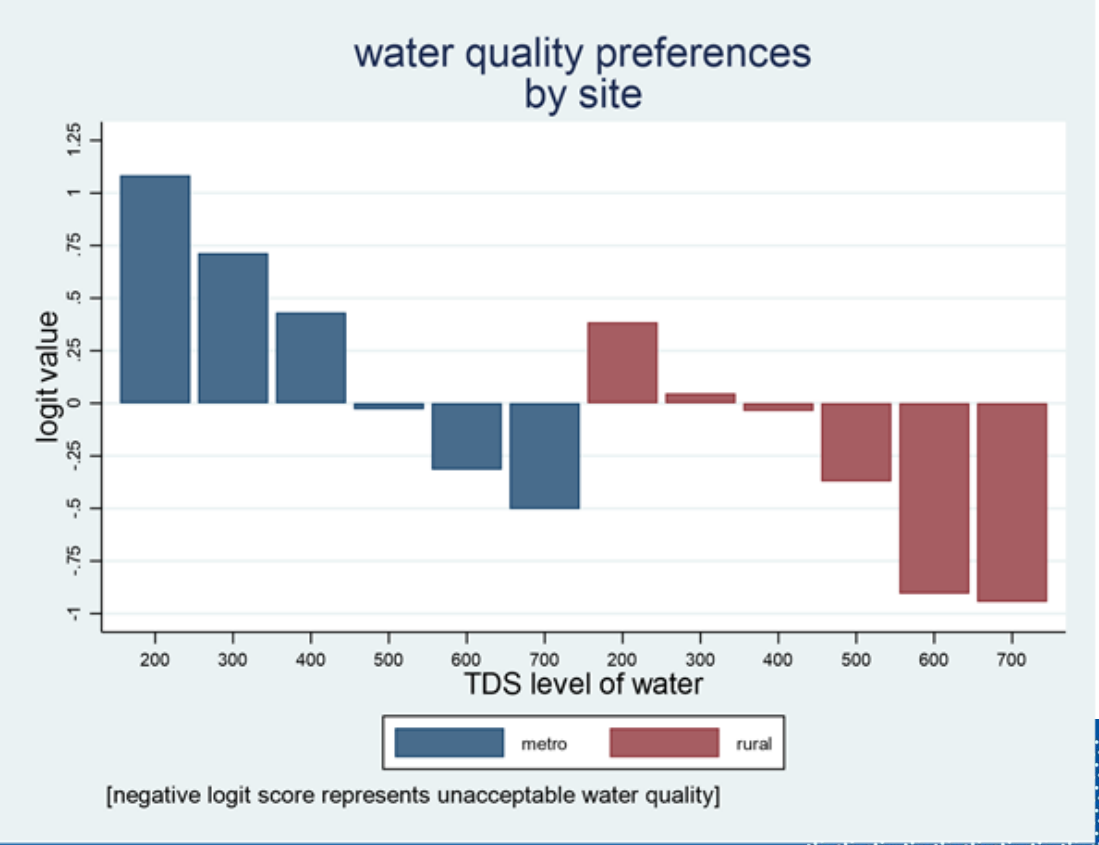
- ◯ Yes
- ◯ No

Anchored Results: Aggregate



[negative logit score represents unacceptable water quality]

Anchored Results: Disaggregated



Key Findings

- Customers can detect a change in taste when a paired comparison method is deployed, and it is statistically identifiable
- There are differences in the acceptability of TDS levels between regional and metropolitan water consumers
- It is possible to identify a threshold of acceptability for different customers **and the acceptable TDS < 600 mg/Lt**

Implications for economic regulator

- **Ignoring customer preferences and sticking to minimum standard is unlikely to be efficient in this case**

Case Two: Customer preferences around diffuse pollutants

Background

- Wastewater reuse being driven by increased demand, climate change
- New threats emerging – e.g. PFAS; AMR
- Can our existing management approaches cope?

The challenge

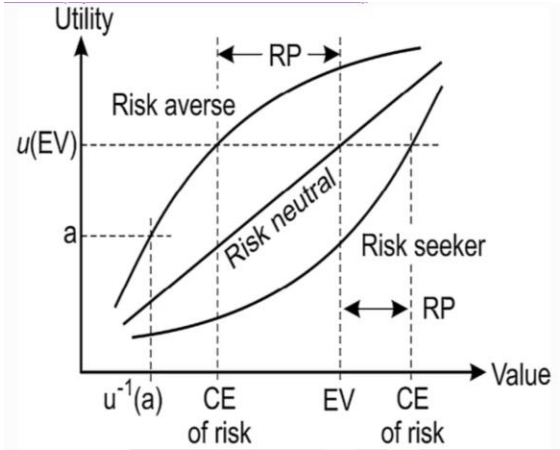
- Guideline values for PFAS can provide a basis for economically justifying some capital works
- Guidance on AMR still a work in progress
- Should the economic regulator block early investments by utilities if they might not deliver with certainty?

Why cost of capital matters

- Current practices ‘merge’ risk and opportunity cost of capital
- Higher risk of underperforming→ higher discount rate

Certainty equivalents?

- Risk aversion of individuals when health involved might offset risk of underperforming infrastructure?
- Does it make sense to apply 7% discount rate and then increase that rate because of the risk of underperforming infrastructure?
- Is that what customers prefer?



Implications for economic regulator

- **Not clear how a regulator can derive an efficient solution in the absence of data on the risk preferences of the community**

Overall message

- As the next water sources are identified and come online, we will need to rethink how economic regulation interfaces with the water industry and the flow-on effects to meetings customers expectations.

- More attention to customer preferences and their risk perceptions seems inevitable.

University of
South Australia

Thank you