

**EXPLORING REGULATORY DILEMMAS:  
TOWARDS UNDERSTANDING THE SYSTEMIC CONSEQUENCES  
OF REGULATION AND REGULATORY INTERVENTION**

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# The Harnessing of Systems Methodologies: The Systemic Structure of Industry Based Dilemmas

- **Introduction & Overview**
- **Case**
  - The Telecommunications Market in New Zealand
- **Markets, Dilemmas**
  - Unbundling, the Sharing of Property Rights, Universal Service Pricing, Price Caps
- **Building a Multi-methodological Systems Approach**
  - Illustrative Causal Loop Diagram (CLD) ..... • Fix that Fails
  - Theory of Constraints (TOC)  
Conflict Resolution Diagrams (CRD) aka ECs
    - Finding Solutions to Dilemma
  - The Second Causal Loop Diagram ..... • Shifting the Burden
  - The Third Causal Loop Diagram ..... • Success to the Successful
  - The Embedded Conflict – nested CRDs
- **Discussion and Conclusions**
- **Questions**

# The Nature of Problem Situations in the Sectors

## Case

- **The Telecommunications Market** in New Zealand
  - Universal Service Pricing and Telecom NZ
  - Price Caps
  - Unbundling the local loop
  - the Sharing of Property Rights

## The Nature of Problem Situations in the Telecommunications Sector

Typical problem situations encompass dilemmas faced by:

- **regulators**
  - seeking to improve price/quality relativities in the telecommunications sector
- **politicians**
  - seeking to legislate the broadening of service provision and
- **competition authorities** and the judicial system
  - charged with determining access rights etc

## The Nature of Telecommunications Sectors

- **Extensive Capital Requirements**
  - related to fixed assets specific to delivery of telecommunications services
  - unavoidable, irrecoverable, sunk costs
- **Necessary and inevitable economies of scale**
- **Effective *de facto* barriers to entry**
- **Absent, minimal or limited competition**
- **Emergent natural monopolies**

# Regulation and Natural Monopoly Markets

## The Telecommunications Sector, & Unbundling

### The Task of the Telecommunications Regulator

- to determine an appropriate *price* for access to, say universal or unbundled services
  - ie to calibrate a complex market system having multiple participants
- to determine an appropriate *price* for provision of universal services
  - and whether or not price capping is appropriate
- to arbitrate between parties whose agendas appear to be mutually exclusive and directly in conflict with each other, or
- to make and impose rules that conflict with the agendas of one or multiple participants

### The Reality of Complexity

- it is unlikely that a single set of decision-making tools will be sufficient for regulators in the majority of industry-specific regimes.
- multiple tools may be necessary to support different types of regulatory decisions

... but:

the use of multiple tools may lead to conflicting or mutually exclusive conclusions about the required regulatory interventions.

## The Role & Benefits of Multi-methodology

### The Role & Benefits of Multi-methodology

- **Role**
  - **provision of multiple perspectives**
- **Benefits**
  - arise from the **mutually informing nature of systems methodologies**  
... in addressing problematic situations, especially how:
  - **the use of one methodology may mutually inform the use of the other,**  
... and how
  - **insights derived from use of one methodology can mutually inform the development of insights from the other**

### The Role & Benefits of a Systems Approach

- provision of a holistic perspective

## Accepted Wisdom?

- that *price caps*
  - ... that is, the *capping of universal service prices*,
  - ... **may facilitate entry** to quality telecommunications services ...
  - ... for otherwise disadvantaged customers
  - ... **in the short term**

... **but** also ... capturing the views of others
- that *capping fees* may likely lead to **unintended consequence**, or **moral hazard**, for example:
- that the lower *revenues* of Telecommunications companies
  - ... will lead to a drive to control *costs* by restricting *investment*,
  - ... thus undermining affirmative action objectives
  - ... to improve access for specific user groups , **in the longer term**,
  - ... so that in effect:
- ***capping prices* may make the problem worse ... in the long run**
  - a *Fix that Fails* (FtF)



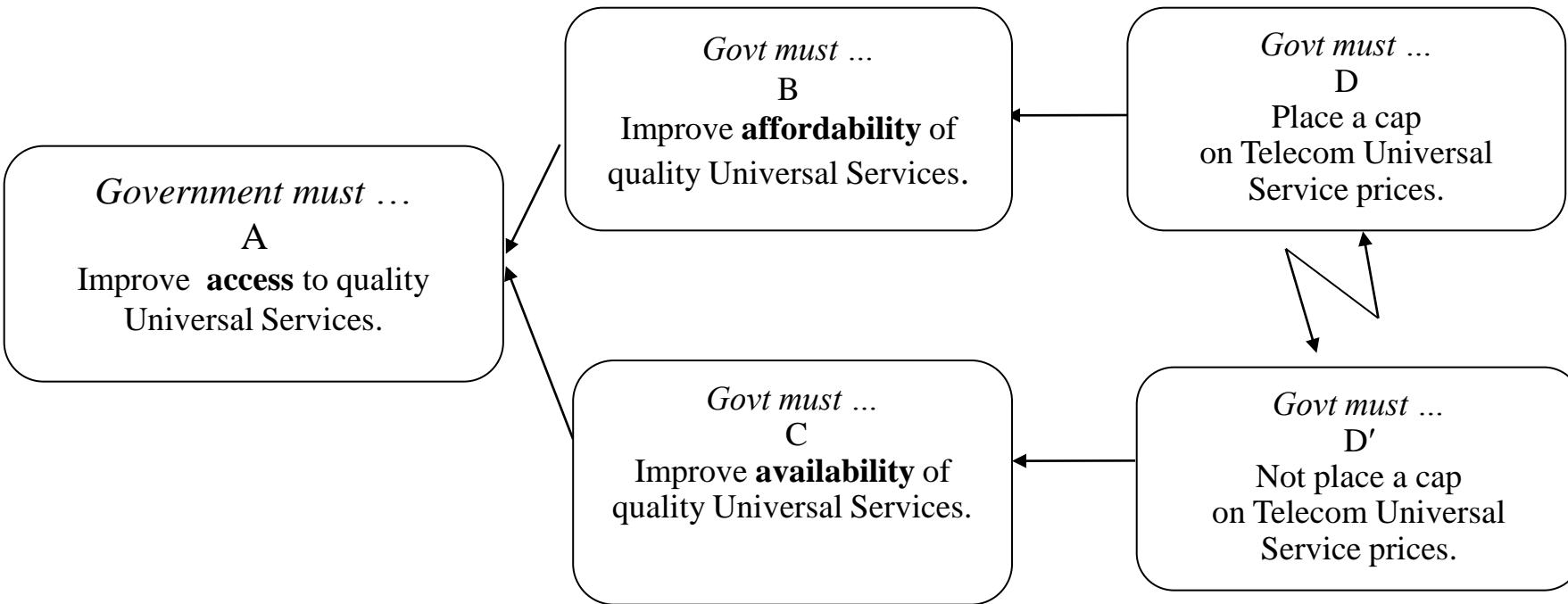
## Insights:

- that the initial CLD does not reflect any system objective or goal
- that the CLD has the characteristics of *Fixes that Fail* (FtF) archetype.
- that an implicit dilemma exists
  - in being required to choose between
    - ... seeming mutually exclusive but necessary actions
      - *capping or not capping*
- that the implicit dilemma can be examined
  - .... in the form of a Conflict Resolution Diagram – an EC diagram.

## An Alternative Systems Representation

- **A Systems Representation – as an EC or Conflict Resolution Diagram**
  - taking account of the system goal
  - displaying how the problem situation  
... can be represented and/or addressed  
.....by invoking the *necessary logic* protocols of the  
... TOC conflict resolution process, aka the EC process:
- the EC process
  - invokes necessity logic of the following form:
    - In order to have A, we must do B, because ...
    - In order to have B, we must do D, because ...

**Figure 2a. The First Conflict Resolution Diagram –  
using the Evaporating Cloud method (EC – CRD)  
Capturing One Perspective on the *Capping Dilemma***

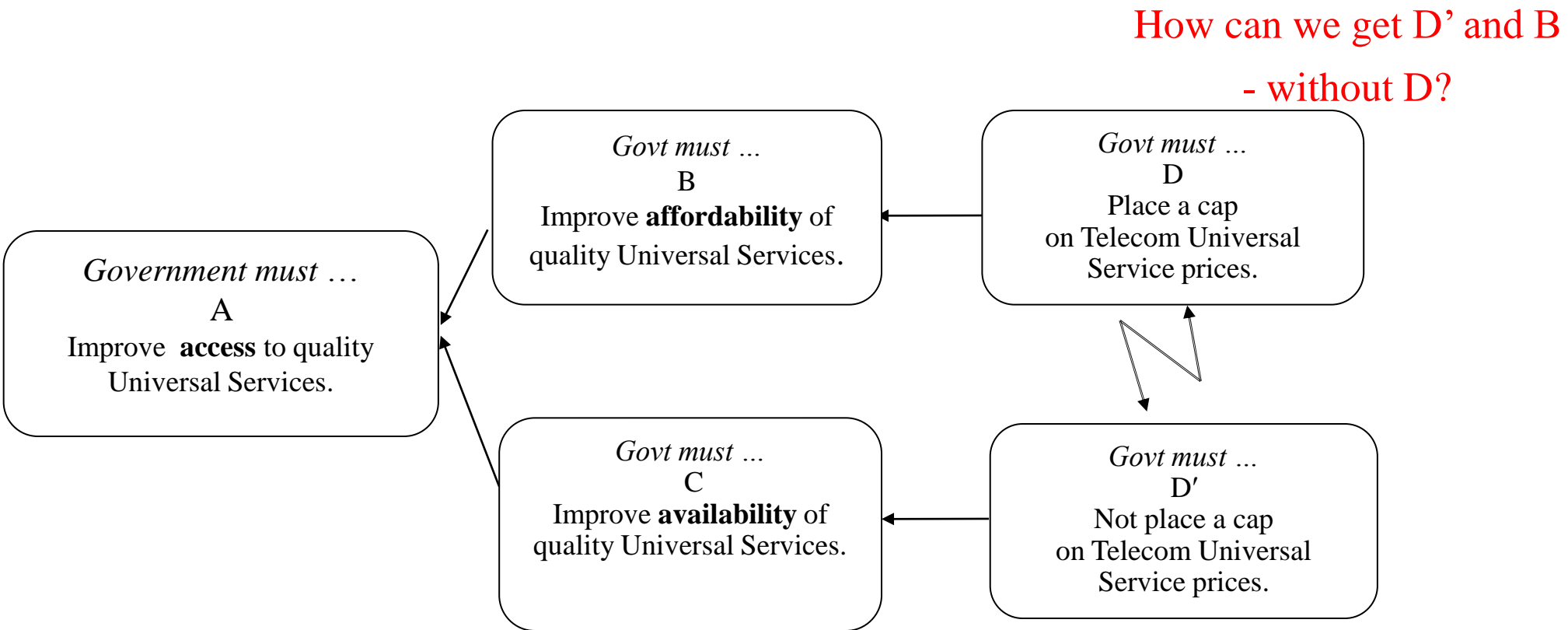


**How to read the cloud:** In order to A, we must B and in order to B we must D.  
On the other hand, in order to A we must C and in order to C we must D'. Hence the conflict!

## Additional Insights:

- **Conceptualisation as an EC – or Conflict Resolution Diagram**
  - draws attention to the **system goal** and
  - can provide a **platform** and **means for finding solutions** to the dilemma

**Figure 2a. The First Conflict Resolution Diagram –  
using the Evaporating Cloud method (EC – CRD)  
Capturing One Perspective on the *Capping* Dilemma**



**How to read the cloud:** In order to A, we must B and in order to B we must D.  
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# Finding Solutions

The quick way?:

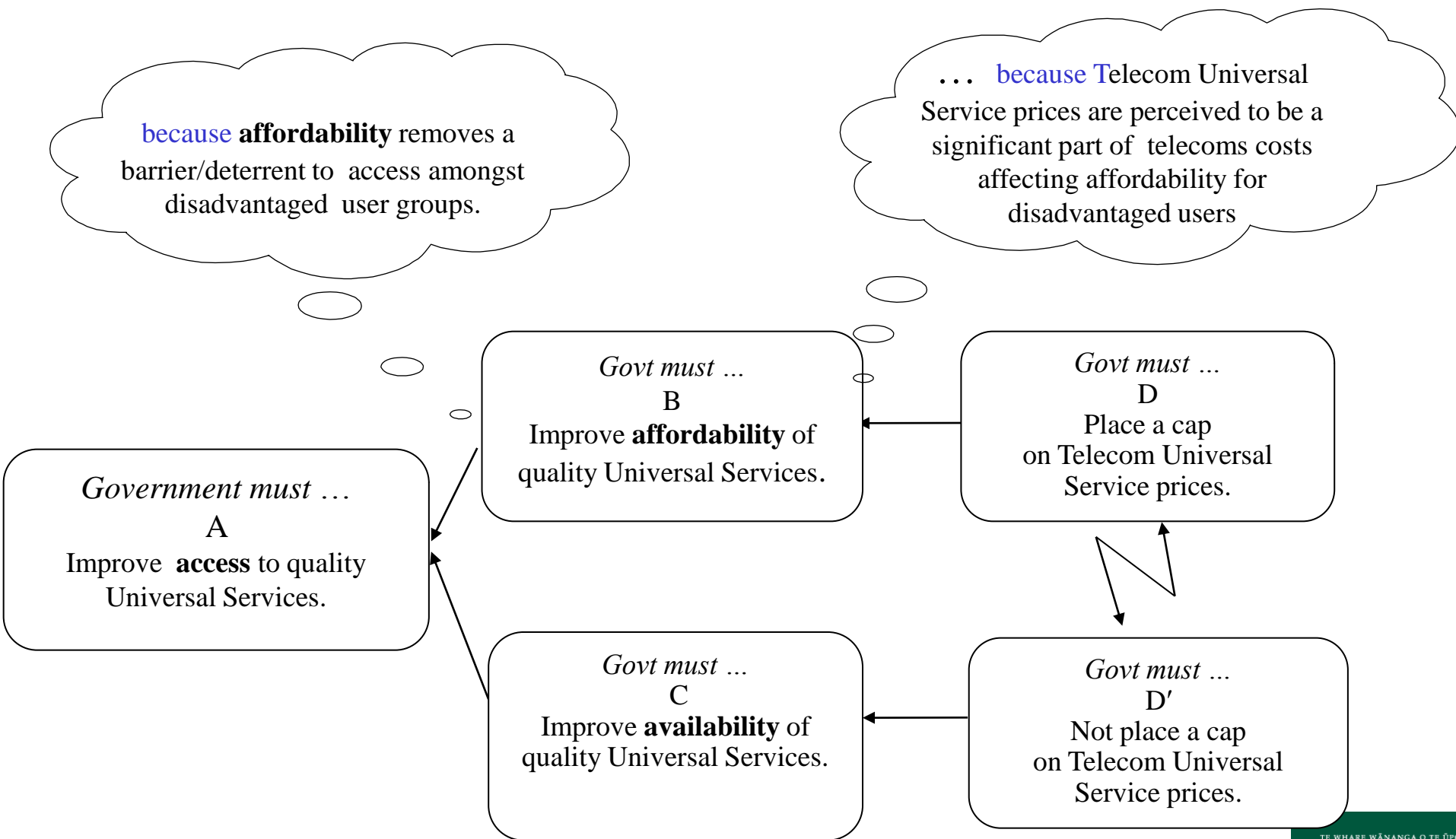
*Make sure that B and C can both be achieved*

	<b>Proposed Injections</b>
<b>D' and B (without D)</b>	Offer subsidies to disadvantaged user groups eg rural users
	Offer subsidies or offsets directly to disadvantaged individual users
<b>D and C (without D')</b>	Offer rewards or incentives to telecoms companies to invest in infrastructure

# Figure 2a. The First Conflict Resolution Diagram - EC – CRD

## Capturing One Perspective on the *Capping Dilemma*

- surfacing assumptions



**How to read the cloud:** In order to A, we must B and in order to B we must D.

On the other hand, in order to A we must C and in order to C we must D'. Hence the conflict!

# Finding Solutions

## The Methodical Way

	<b>Assumptions</b> ... because	<b>Injections</b> ... to attack the assumptions and break the conflict
<b>A</b>		
<b>AB</b>	Usage is price sensitive, and price is a perceived deterrent to access and use telecoms services.	High price may be OK if quality and reliability more important.
<b>BD</b>	Rural users are disadvantaged by universal service price levels.	Provide subsidies to disadvantaged rural users.
<b>AC</b>	Investment is needed to improve quality of network.	Compensate for quality with other beneficial trade-offs.
<b>CD'</b>	Regulated price caps will adversely impact revenues and undermine or discourage willingness to invest.  Providers fear further 'interference' from regulators.  Regulatory intervention, as with price caps, generates uncertainty and fear amongst providers.	Ensure providers are: - rewarded/compensated for beneficial investment; - incentivised to invest beneficially  Reduce uncertainty and fear of interference in future.
<b>DD'</b>	Can't cap and not cap prices at the same time.	Could cap some prices and not others – a variety of ways are possible.

## Additional Insights:

### Conceptualisation as an EC - CRD

- can provide a **platform** and **means for finding solutions** to the dilemma, and ...
  - in particular, thinking about intervention and its consequences
    - invoking the **TOC Negative Branch Reservation (NBR) process**
      - to **mitigate and avoid possible negative effects** of intervention
- can draw attention to the **system goal** and ...
- can provide a platform for **reconceptualising the dilemmas**
  - using the Causal Loop Diagrams (CLDs) of qualitative systems thinking
    - to **understand** more about the **systemic nature and structure** of the dilemma
  - using the EC process **to reveal the embedded nature of dilemma/conflict**

## Additional Insights:

### Conceptualisation as an EC - CRD

- can provide a **platform** and **means for finding solutions** to the dilemma, and ... in particular,
- to **understand** more about
  - the **systems goals**
  - **the systemic nature and structure** of the dilemma
  - **alternative choices**
- can also be **used to depict the alternative choices in a reconfigured CLD** - that has characteristics of
  - Senge's *Shifting the Burden* (StB) archetype.
- **and also to depict other unintended outcomes in another reconfigured CLD** - that has characteristics of
  - Senge's *Success to the Successful* (StS) archetype.
- **and to reveal the embedded nature of dilemma/conflict**

See  
Figure 3.

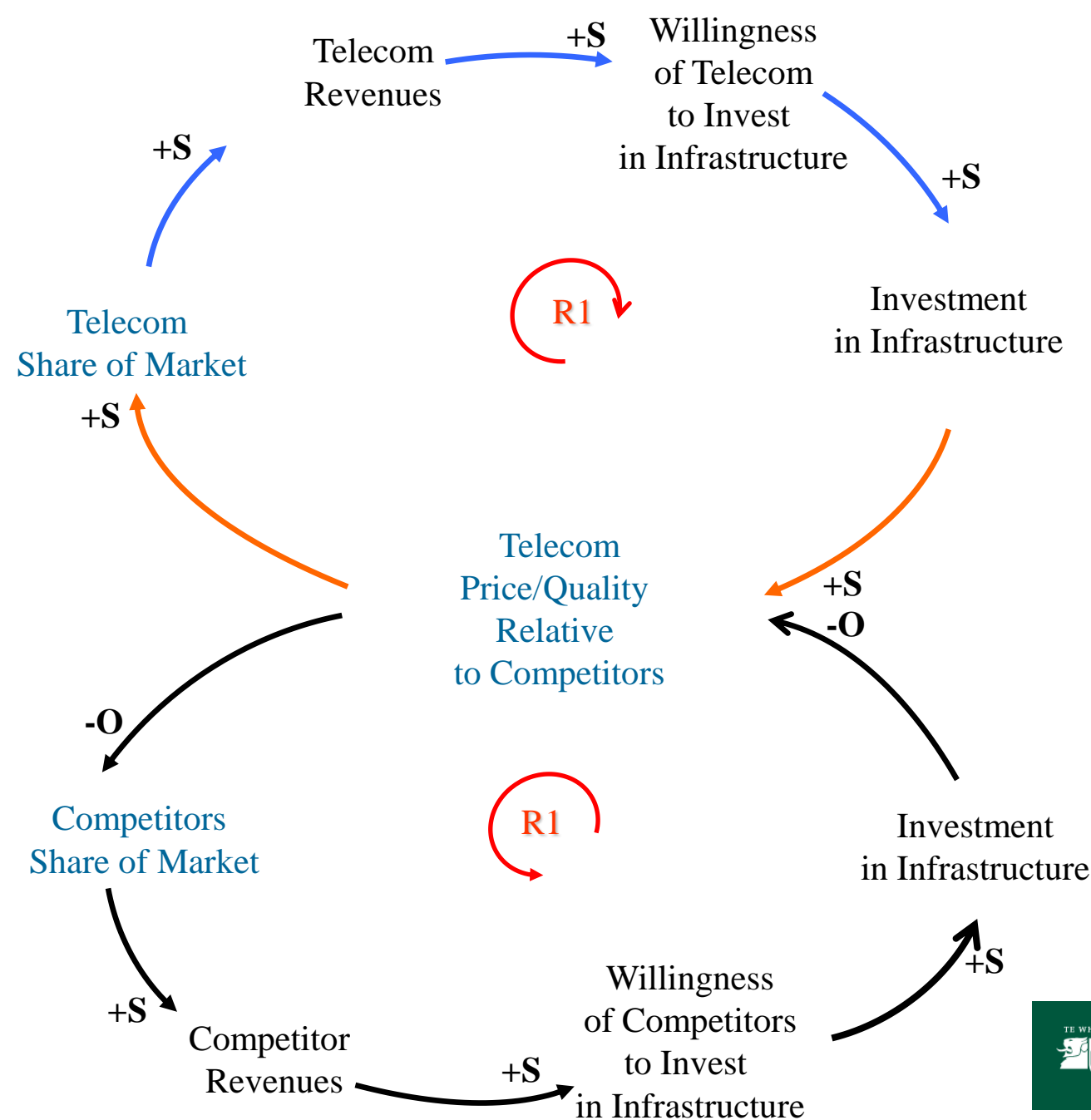
See  
Figure 4.

# Questions?

**Reconceptualising the dilemmas**  
using the  
Causal Loop Diagrams (CLDs)  
of  
qualitative systems thinking  
and the  
Conflict Resolution Diagrams and  
EC process  
of TOC



Figure 4. The Third CLD - Success to the Successful Archetype



## Additional Insights:

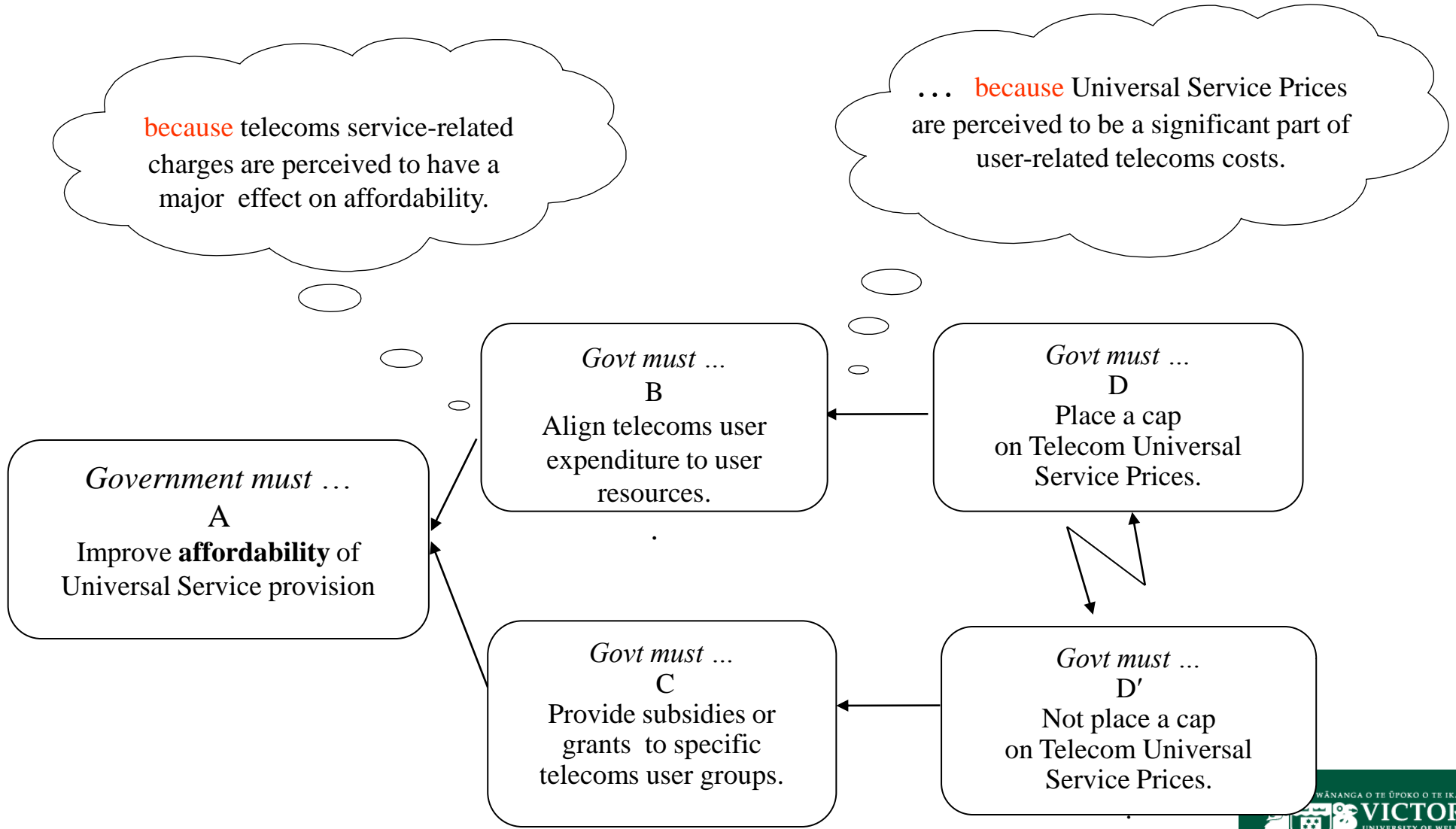
- The **StB** CLD generates **further insight** about the dilemma, in particular, that ...
    - *capping prices* by means of the Universal Service order may again likely
      - **lead to an unintended consequence**, or moral hazard, of a different nature,
        - it may not just **make** the problem of **access to quality services worse**,  
BUT
        - **may undermine the future capability** of Telecom **to improve access** for users  
**through other fundamental long term alternative action**  
... for example, investing in infrastructure, and ...
- See Figure 3.**
- The **StS** CLD generates **insight** about outcomes relating to alternative choices, in particular, that ...
    - *capping prices* by means of the Universal Service order may
      - lead to competitors benefiting from pricing differentials
      - leading to gains in market shares, revenues etc
      - leading to additional opportunities to invest in infrastructure
      - Leading to improvements in competitors' price/quality relativities
      - leading to gains in market shares, revenues etc
      - **leading to changes in market dynamics ... where the strong get stronger etc**
- See Figure 4.**

## An Initial Perspective on Nestedness - and Embedded Conflict

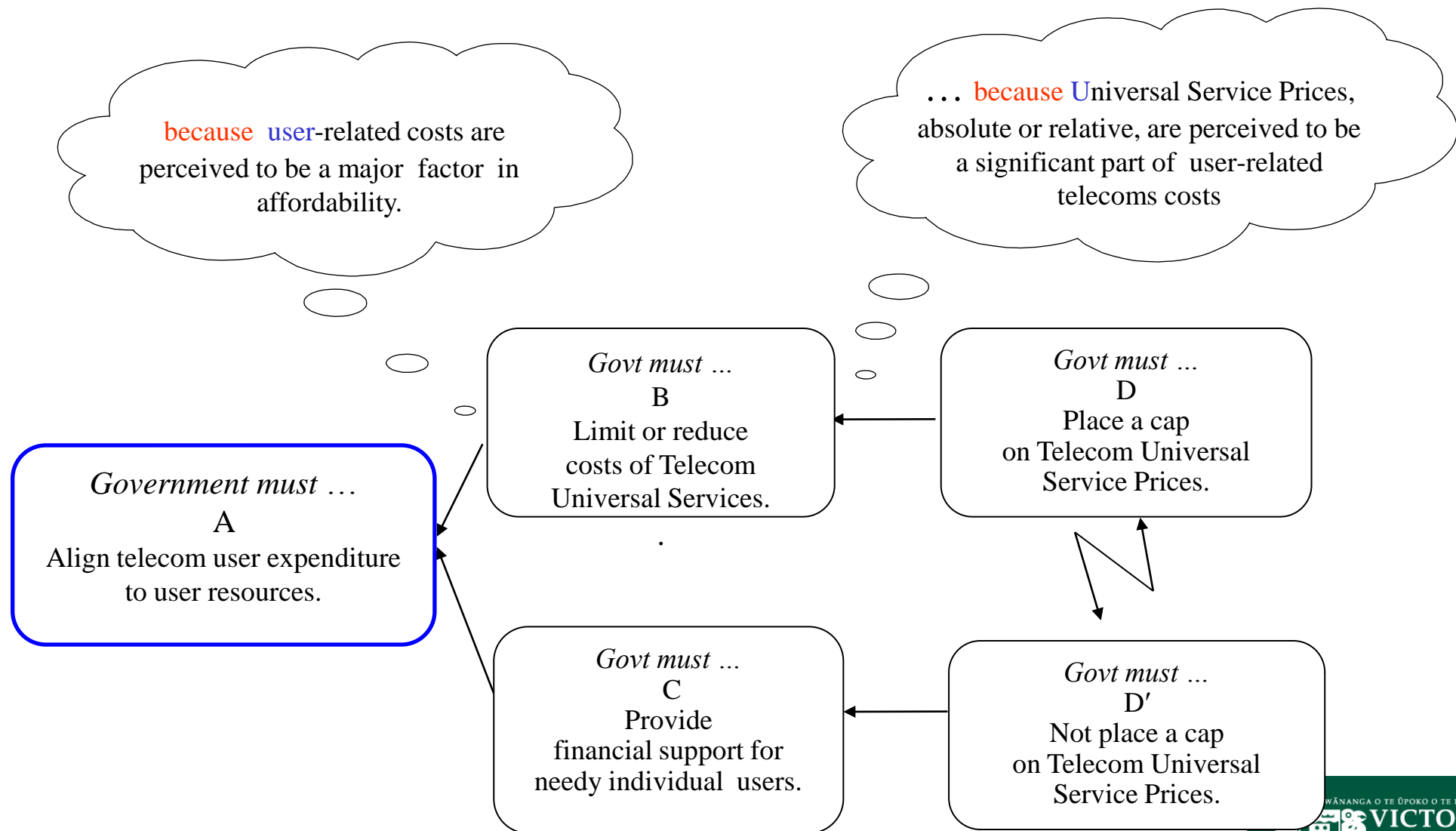
- We now use the EC approach to demonstrate
  - ... the nature of **three** different **perspectives** on what the dilemma is
  - ... and how they give rise to systemic nestedness.
  
- In particular, we can demonstrate a common feature of what we may call
  - *wicked* dilemmas
    - ... that have conflict embedded at different levels.

# Figure 2b. The Second EC - Capturing a Second Perspective on the Dilemma with an alternative system goal – relating to Affordability

- surfacing assumptions

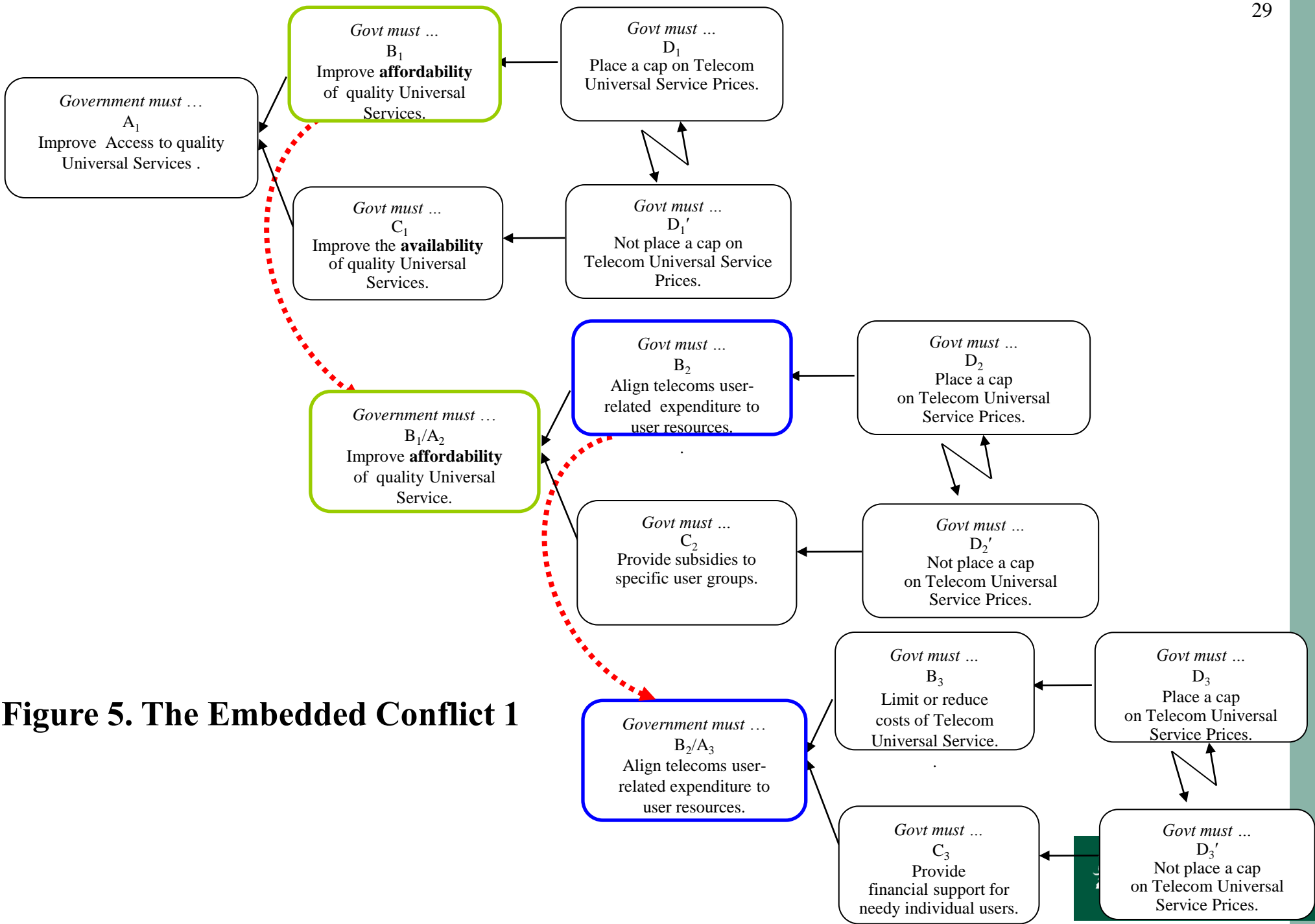


## Figure 2c. The Third EC- Capturing a Third Perspective on the Dilemma with another alternative system goal



## An Initial Perspective on Nestedness - and Embedded Conflict

- We now show how the three perspectives provide an example of systemic nestedness.
- In particular, we can demonstrate a common feature of what we may call
  - *wicked* dilemmas
    - ... that have conflict embedded at different levels.

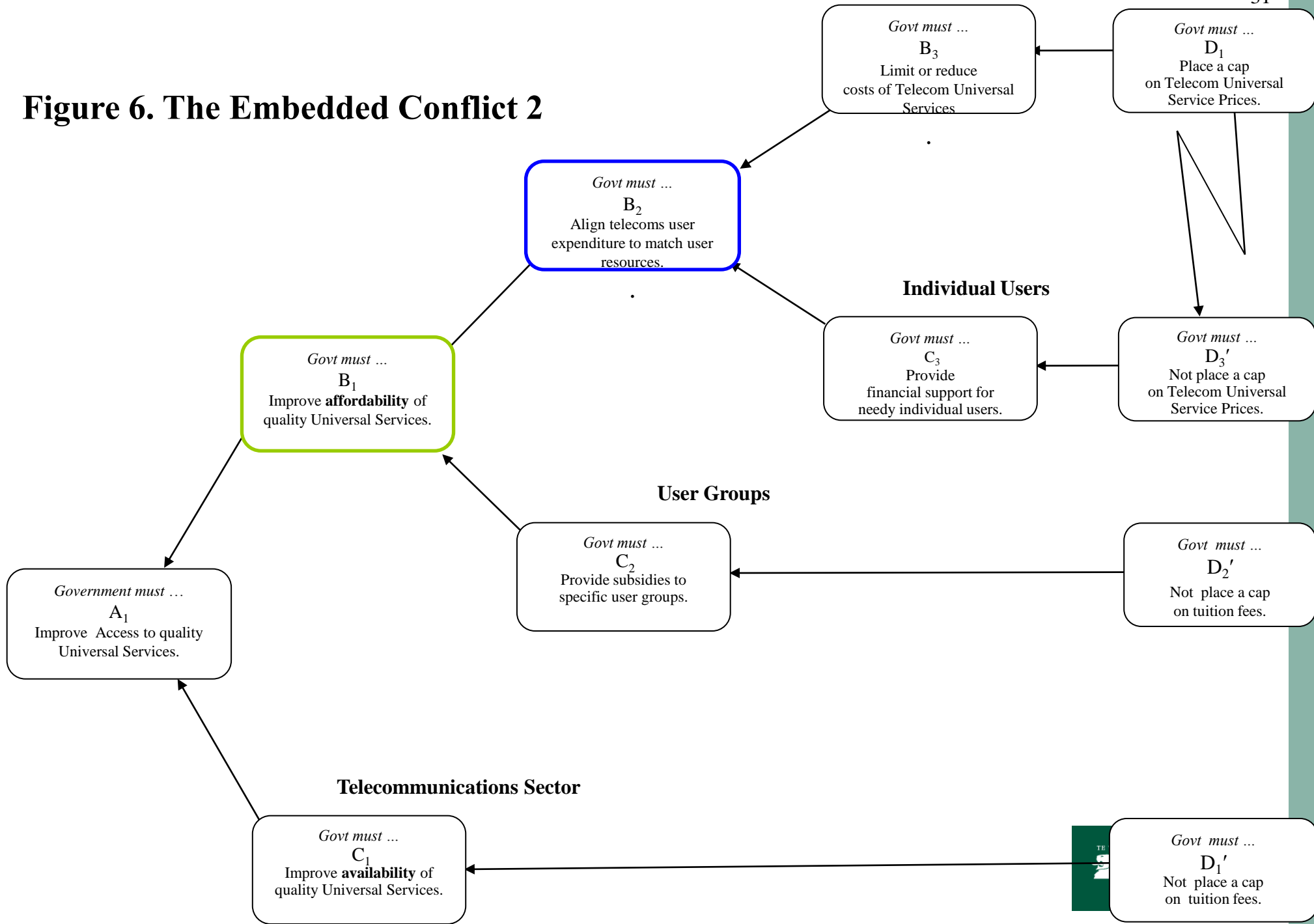


**Figure 5. The Embedded Conflict 1**

## An Alternative Perspective on Nestedness and Embedded Conflict

- We also provide a different representation of nestedness
  - to create further insight about its nature  
... and possibly ...
  - to show how the conflict may be addressed.

# Figure 6. The Embedded Conflict 2



## Concluding Insights - 1

The systems representations of Figures 4 and 5,

- highlight how **alternative action choices to the capping of universal service pricing**  
... necessarily **reflect** the systemic and **nested nature of differing needs**  
... surfacing at the level of
  - **individual users**
  - **specific user groups**
  - the telecommunications sector as a **whole**.

## Concluding Insights - 2

- Here, we note that the nested nature of the dilemma  
... facing policy makers and political decision makers ...  
... is such that they are torn between addressing:
  - (1) the **specific cause of economic or financial benefit or cost**  
... faced by any individual user
    - that is, addressing the level of the universal service price;
  - (2) the **needs of individual users** in some holistic sense;
  - (3) the **needs of the wider user groups** as a whole; or
  - (4) **matters** at the **sector or societal** level

## Concluding Insights - 3

- Paradoxically, the representations in Figures 4 & 5,
  - not only highlight ...
    - the **complexity** and **confounding nature** of nested conflict,
  - but are able to represent that complexity in a parsimonious fashion.
- Indeed, the **clarity of such presentations provides**, in itself,
  - **some evidence** of the degree to which ...
    - the **nested nature of conflict** or dilemma
      - **gives rise to confounding issues** and
      - may confound **attempts at understanding and responding to such dilemmas.**

## Concluding Comments - 4

### Understanding the Nature of Regulatory Dynamics

- understanding the systemic nature of relationships
- distinguishing between individual & systems behaviour
- the quick fix may have unintended consequences long term
- Setting price caps may lower costs for users in the short term,  
... **but** undermine investment by Telecom and its competitors long term
- opening up access to other competitors to compete below the price caps in specific markets may boost competition and lower user costs in some markets short term,  
... **but** undermine investment by Telecom and its competitors long term
- requiring greater investment in infrastructure to improve quality or broaden provision  
... may lower willingness to commit to price caps in the long term
- enhanced insight about the nature of chronic conflict, and the consequent pendulum swings

## Concluding Insights - 4

### Other Methodological Insights

- the initial plausible CLD may not necessarily capture alternative options
- use of the CRD - EC requires identification of:
  - the overall system goal **and** the core choice dilemma  
**and** the explicit surfacing of assumptions and beliefs
- leading to a more comprehensive CLD,  
... and better diagnosis and understanding of the nature of chronic conflict
- the ubiquity of Senge's archetypes

### Multi-Methodological Insights

- relating to:
  - not only how one methodology can mutually inform use of the other,
  - but how insights derived from use of one methodology can also mutually inform the development of insights from the other.

# Questions?