

# **A strategy for maximising the potential of the interface between science and policy**

## **Brisbane Ecosciences Precinct Seminar**

25 June 2014

**Dr Mark Matthews**

Executive Director, HC Coombs Policy Forum

Senior Advisor, Crawford School of Public Policy, ANU

[mark.matthews@anu.edu.au](mailto:mark.matthews@anu.edu.au)

## **Context**

Strategy = compliance = bad idea [we need a strategy upgrade]

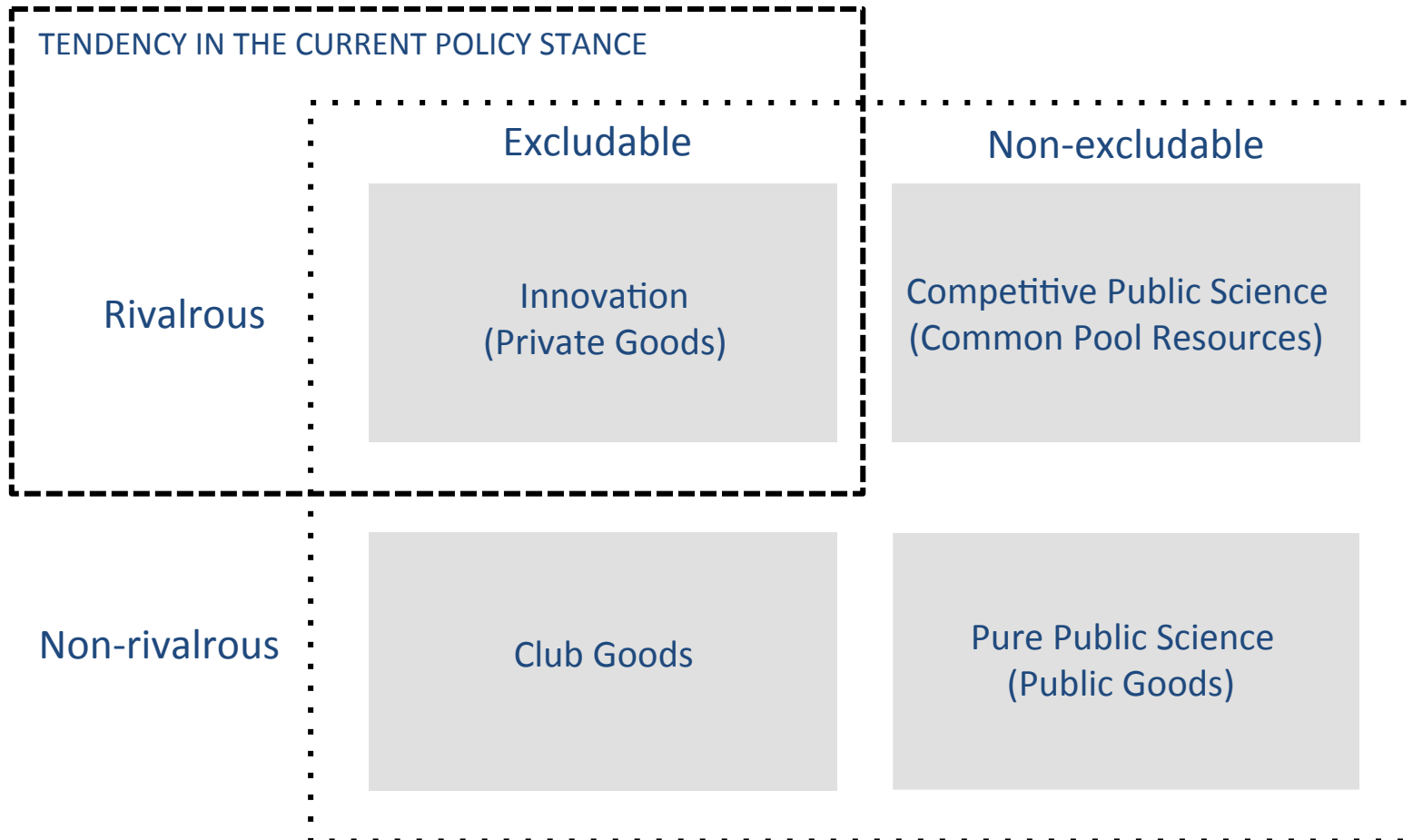
- strategy is not an exam in which government sets the questions
- foster distinctive missions & how we choose to demonstrate success
- avoid competing via 'sameness'

Need to shift to the front foot as regards demonstrating public value

Tremendous scope for public science to demonstrate public value due to governments' distinctive role as uncertainty and risk manager of last resort

Stop subsuming science policy within innovation policy...

**Time to broaden how we approach Public Value?**



## **Evidence based policy making & real policy decision-making**



Image © Mark Matthews

We can only observe the valley we are in (evidence). We must conjecture about what lies in the next (unobserved) valley based on accumulated pattern recognition experience: previous conjectures tested by learning-by-doing

This can take many academics out of their comfort zone (detailed scrutiny of parts of the valley of evidence they are in)

As uncertainty and risk managers of last resort, governments have responsibility for speculating about what the hidden valley may look like (on the basis of pattern recognition)

## Lets re-think the time-line.....

Current thinking: “jam tomorrow”

- e.g. equity in start-ups = *potential but with risks*
- innovation and productivity growth (eventually)



An alternative perspective: “jam today”

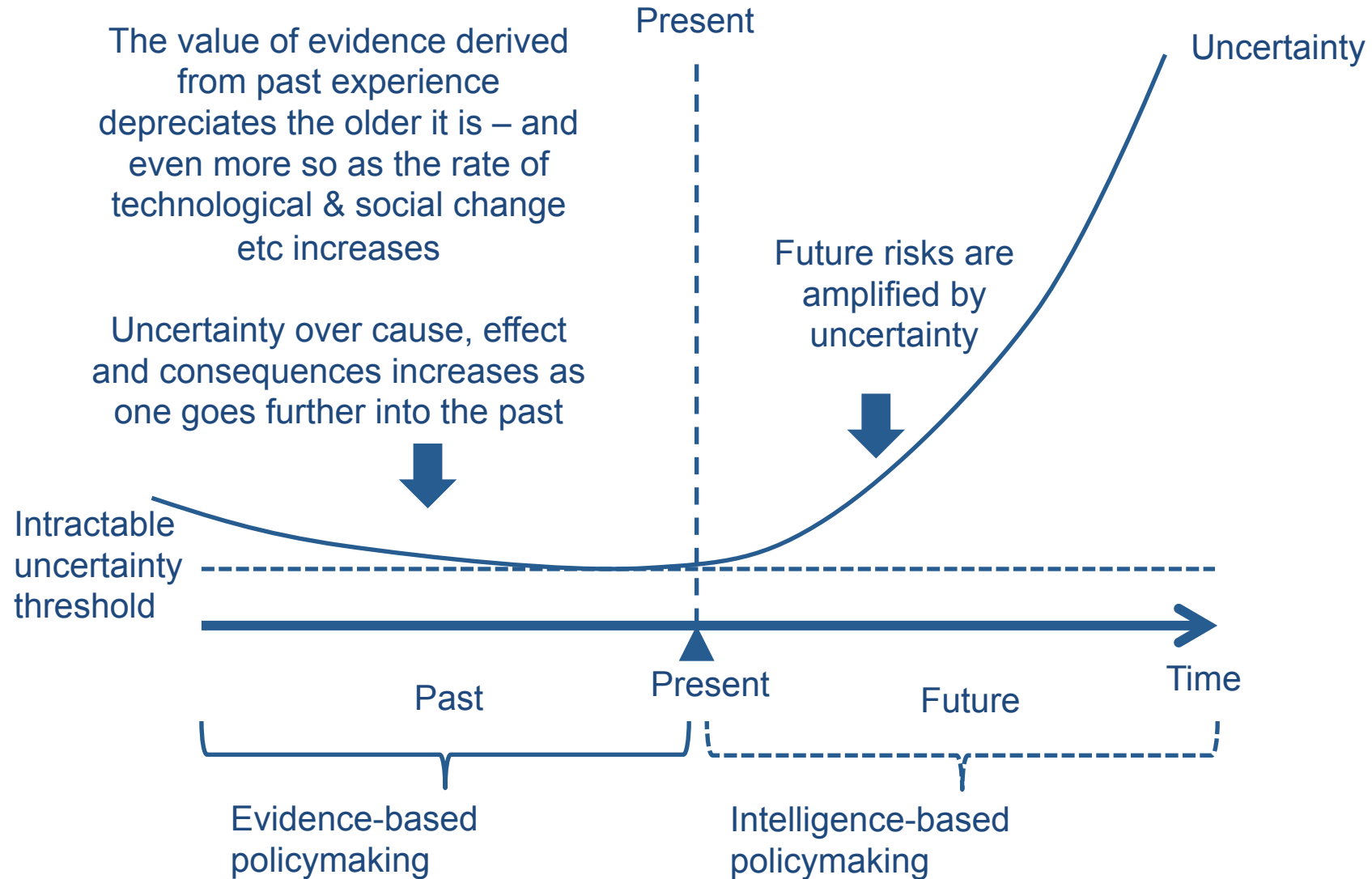
- “it is already factored into the share price..”
- public science increases our level of “preparedness”

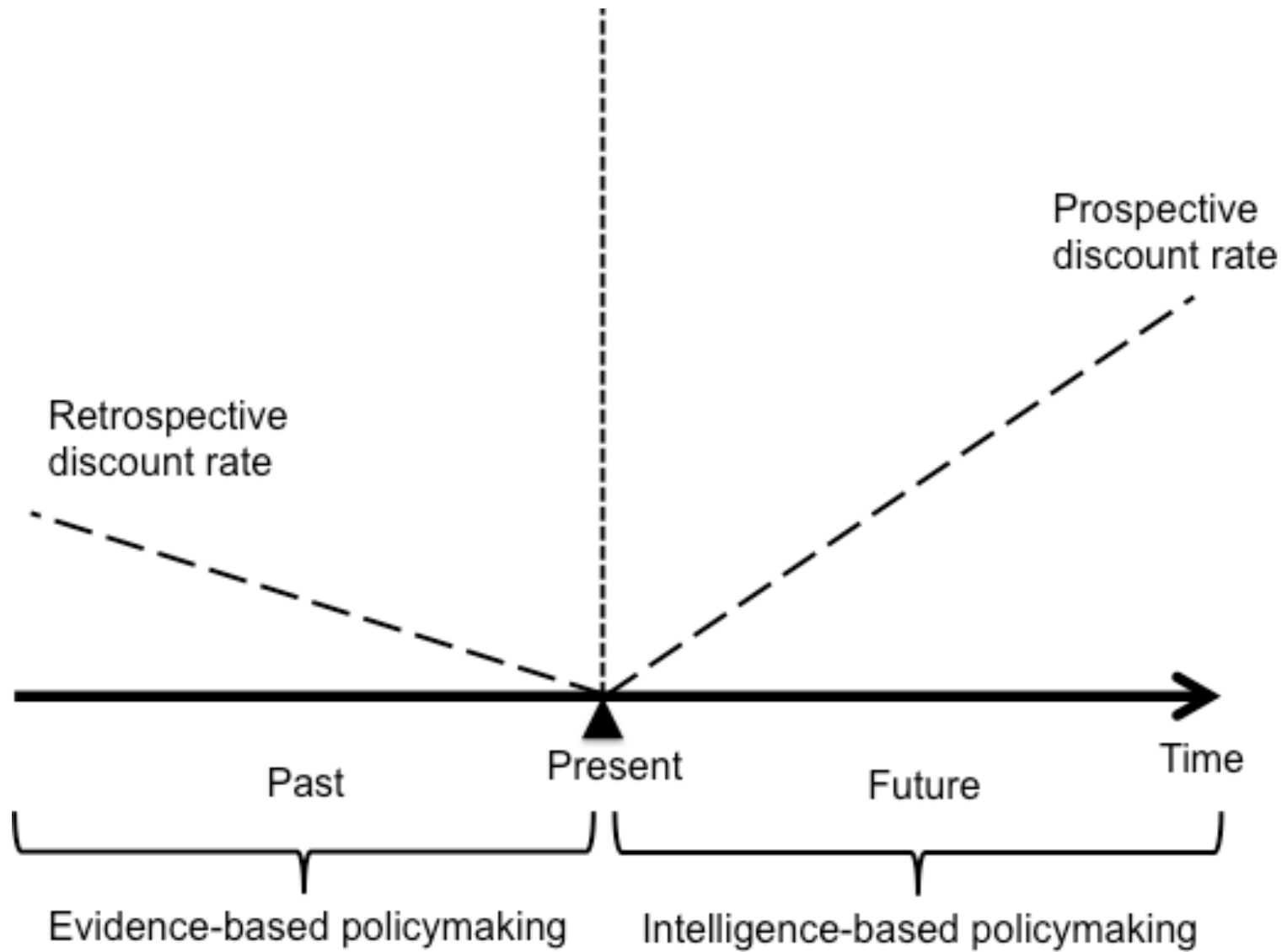


Time

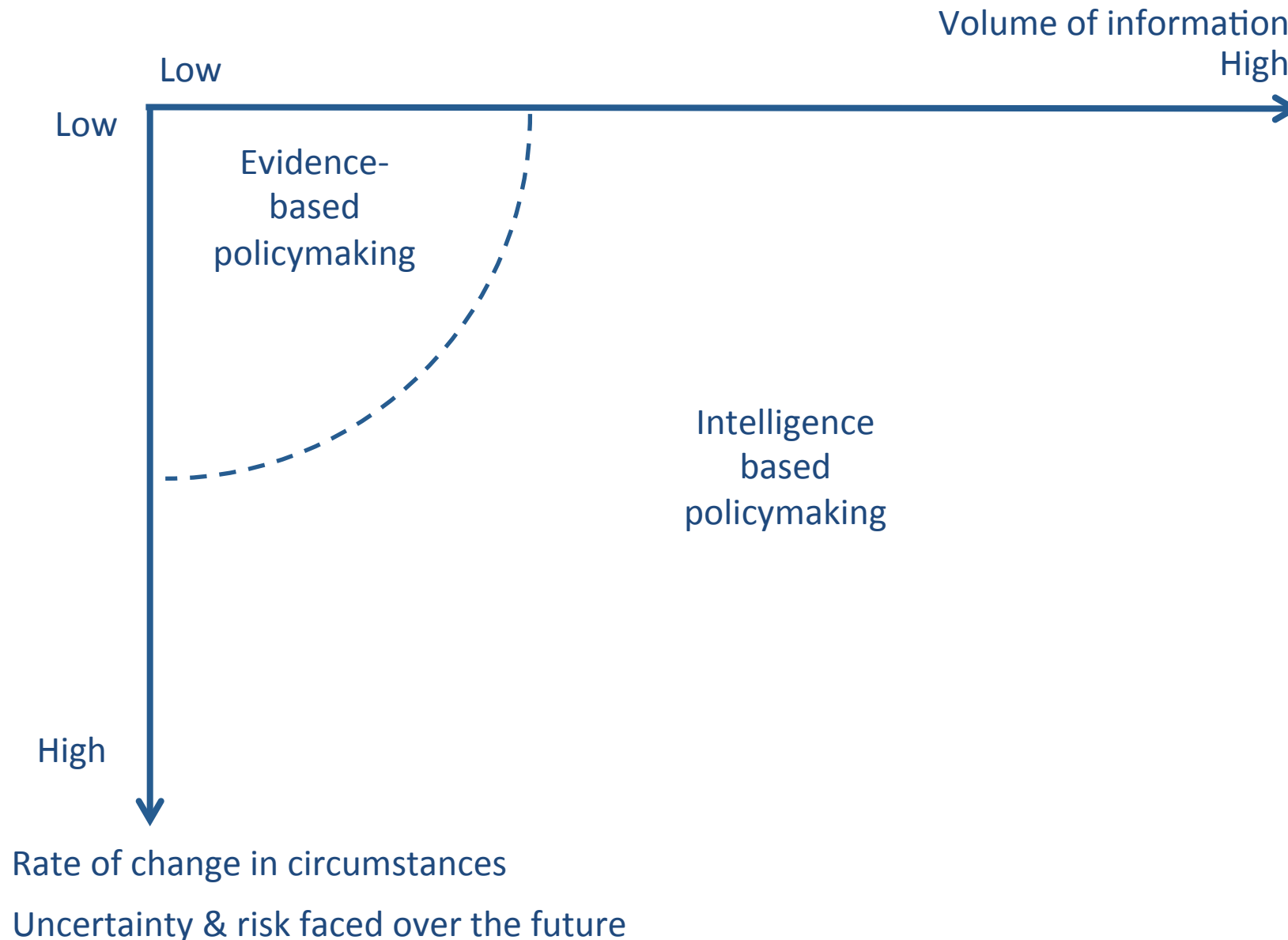
## **Preparedness as an outcome class**

- Arguments developed in a paper commissioned by FASTS (a submission to the 2006 Productivity Commission study on S&I)
- The benefits generated by public science are so important and pervasive that they have become almost invisible
- Public science identifies future risks and uncertainties about these risks
- Decision-makers throughout the economy act accordingly - *anticipating* and generating options in an uncertain world
- Our understanding of what the future *may* have in store for us affects what we do *now* - in so doing changing the future (e.g. climate change research)
- Our “mapping” of the odds we face in the future can change these odds (the double hermeneutic’ at work)









# HC Coombs Policy Forum

A Joint Australian Government – Australian National University initiative

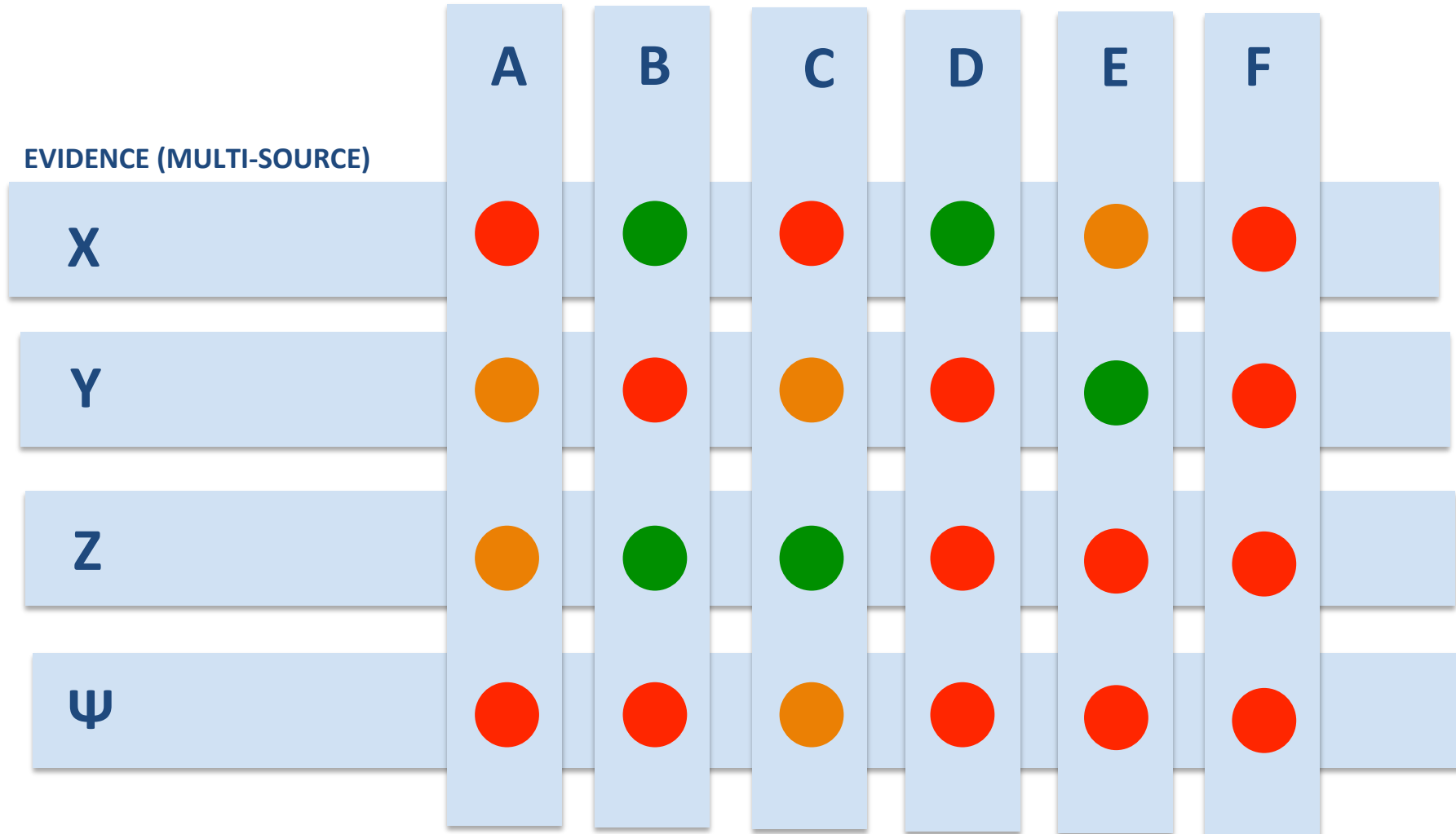
*JUDGE HYPOTHESES BY THE  
LEAST NUMBER OF NEGATIVE  
ASSESSMENTS*

## COMPETING HYPOTHESES

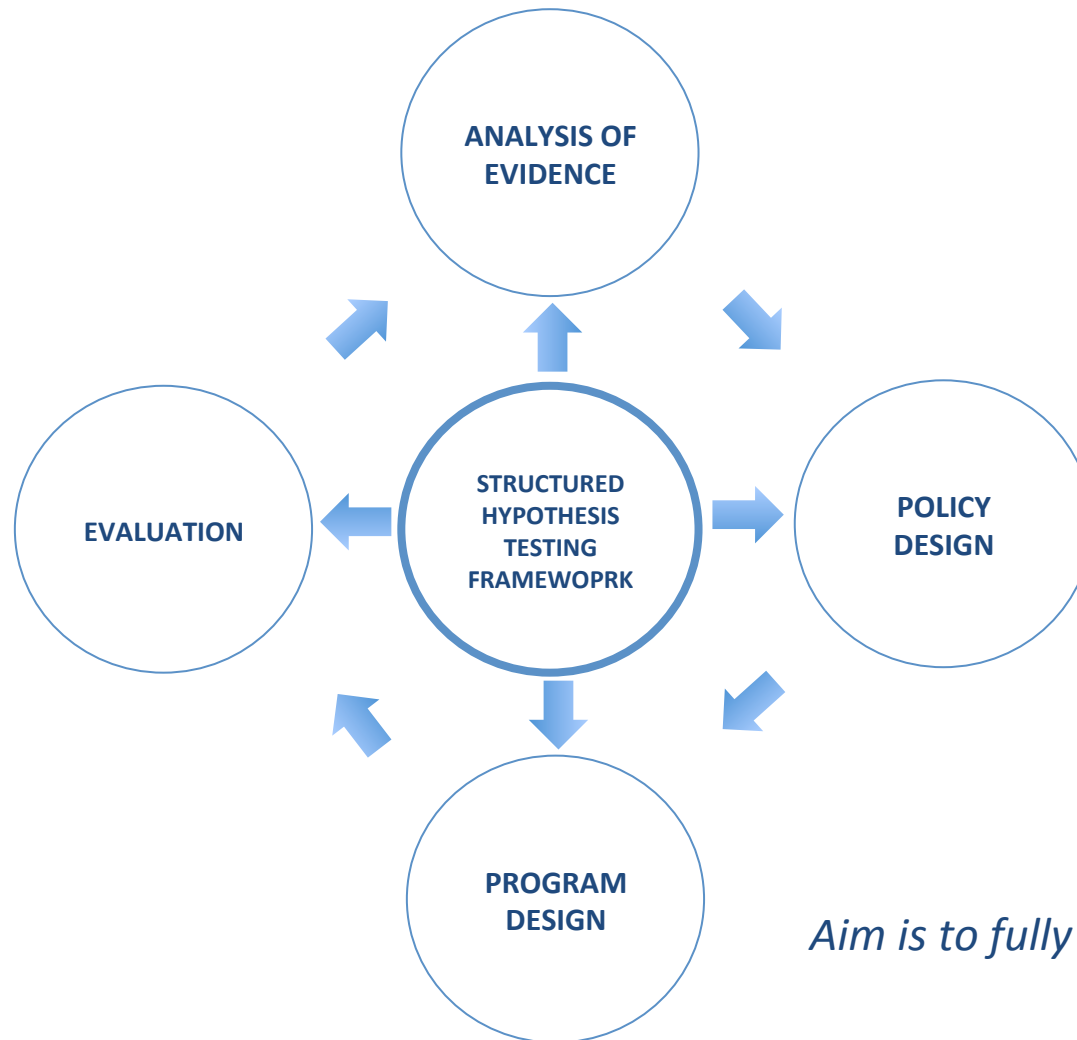
# Crawford School of Public Policy

Australian National University

*THE GREATER THE UNCERTAINTY THE  
LARGER THE NUMBER OF COMPETING  
HYPOTHESES SHOULD BE*



### Exploring the comprehensive use of structured hypothesis testing



Particularly interested in designing and testing better ways of managing risk management via the use of structured hypothesis testing.

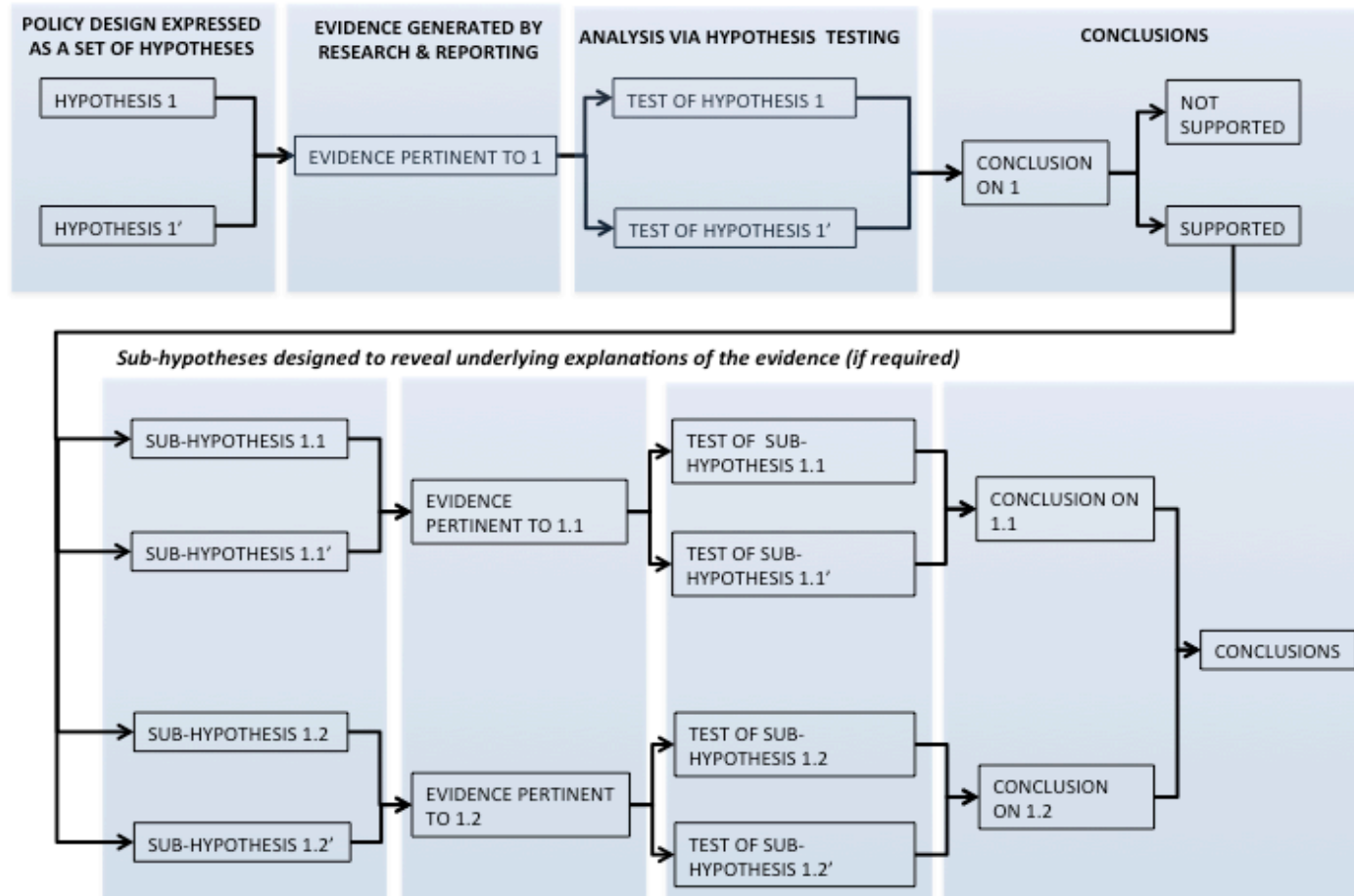
Reducing the risks of

- misdiagnosis of causes of problems
- negative unintended consequences
- wasted spending due to low efficacy

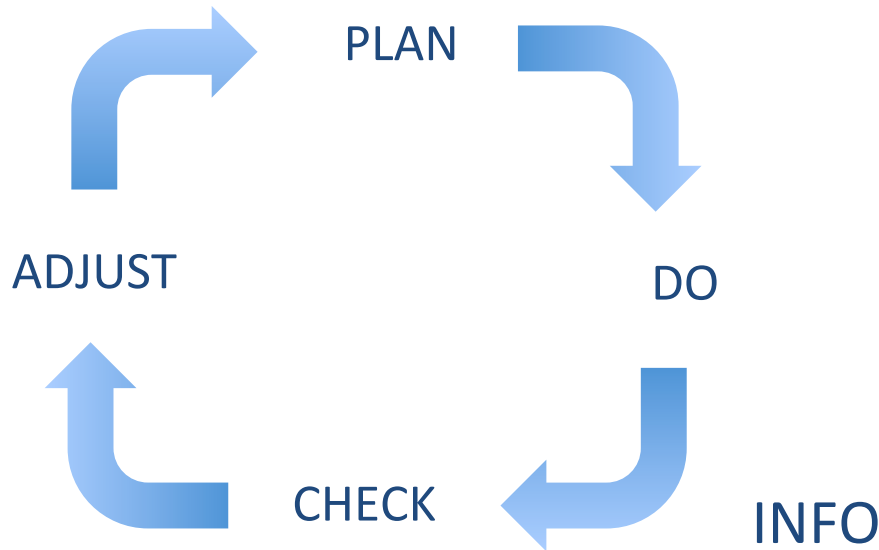
*Aim is to fully integrate evaluation into wider governance functions*

## Diagnostic nesting of hypotheses

ILLUSTRATION OF HYPOTHESIS NESTING



*Currently being trialed by the Productivity Commission in Australia (review of business regulation)*



PROVIDE A MEANS OF COLLECTIVE LEARNING VIA ITERATIONS IN THE HYPOTHESES BEING TESTED

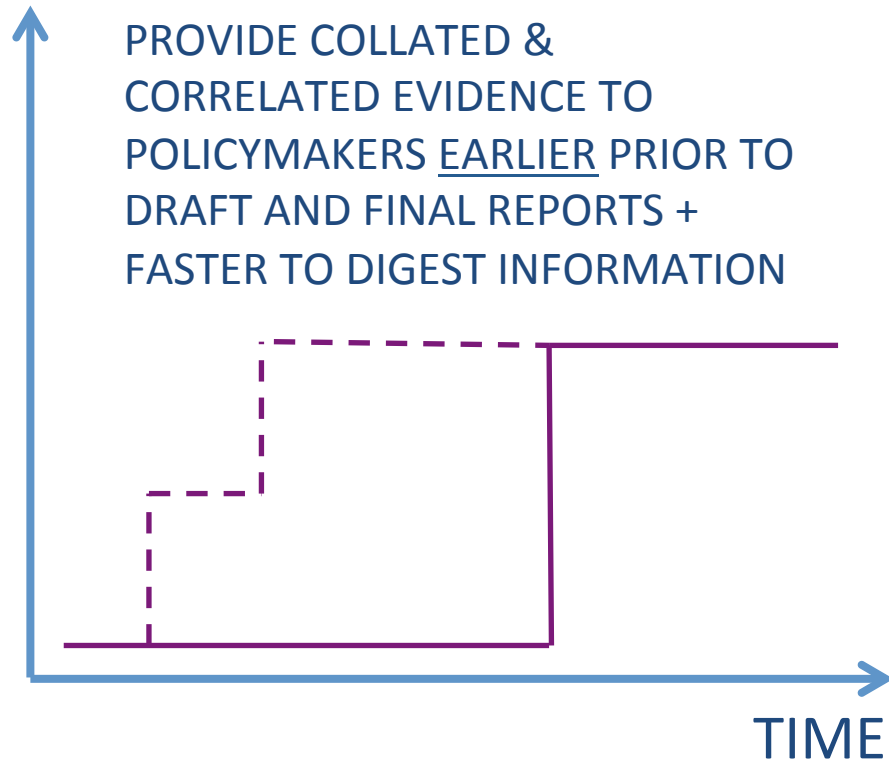
PROVIDE COLLATED & CORRELATED EVIDENCE TO POLICYMAKERS EARLIER PRIOR TO DRAFT AND FINAL REPORTS + FASTER TO DIGEST INFORMATION

JUDGE HYPOTHESES BY THE LEAST NUMBER OF NEGATIVE ASSESSMENTS

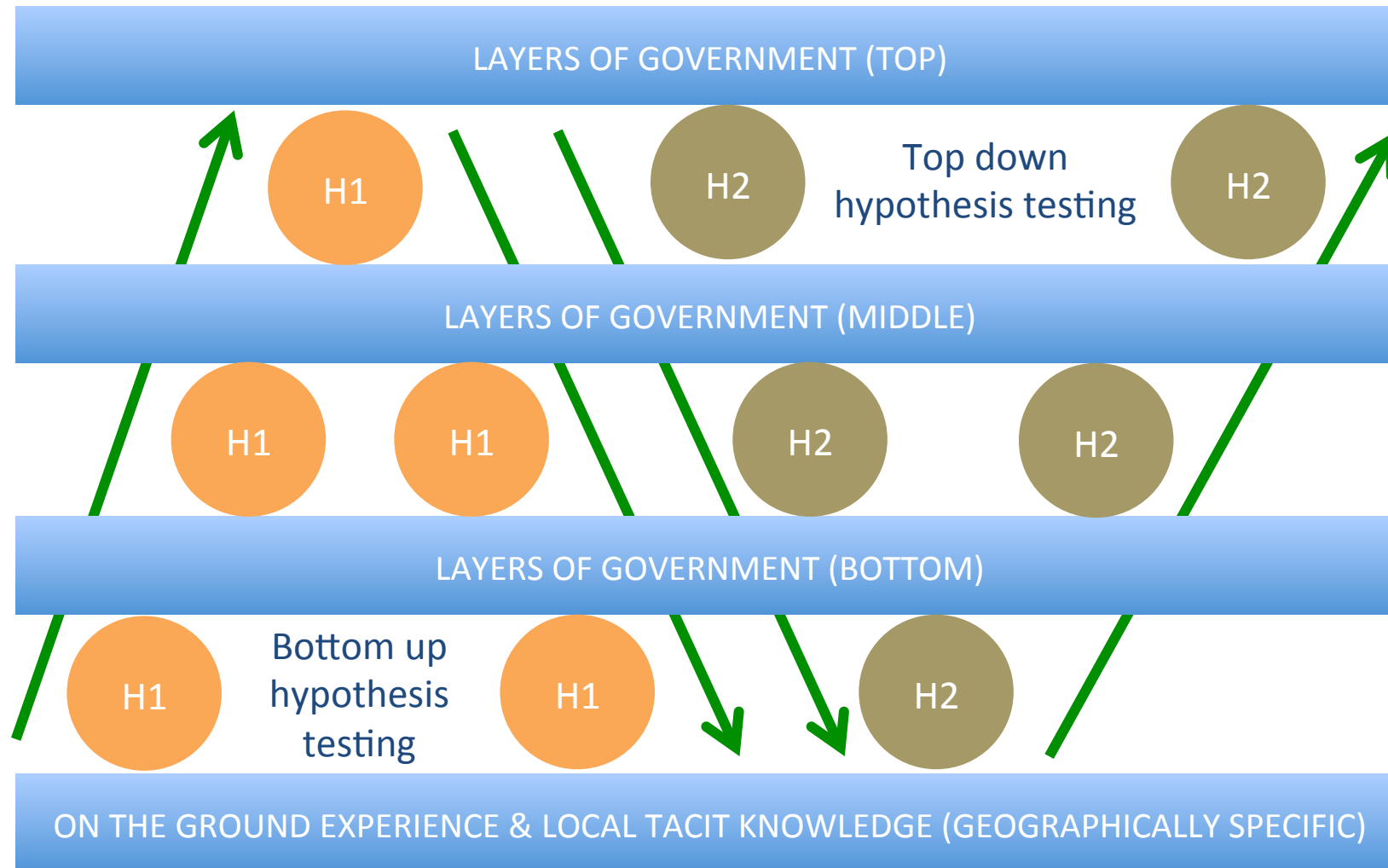
COMPETING HYPOTHESES

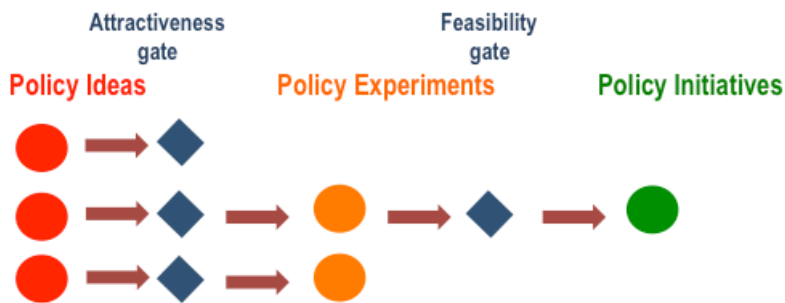
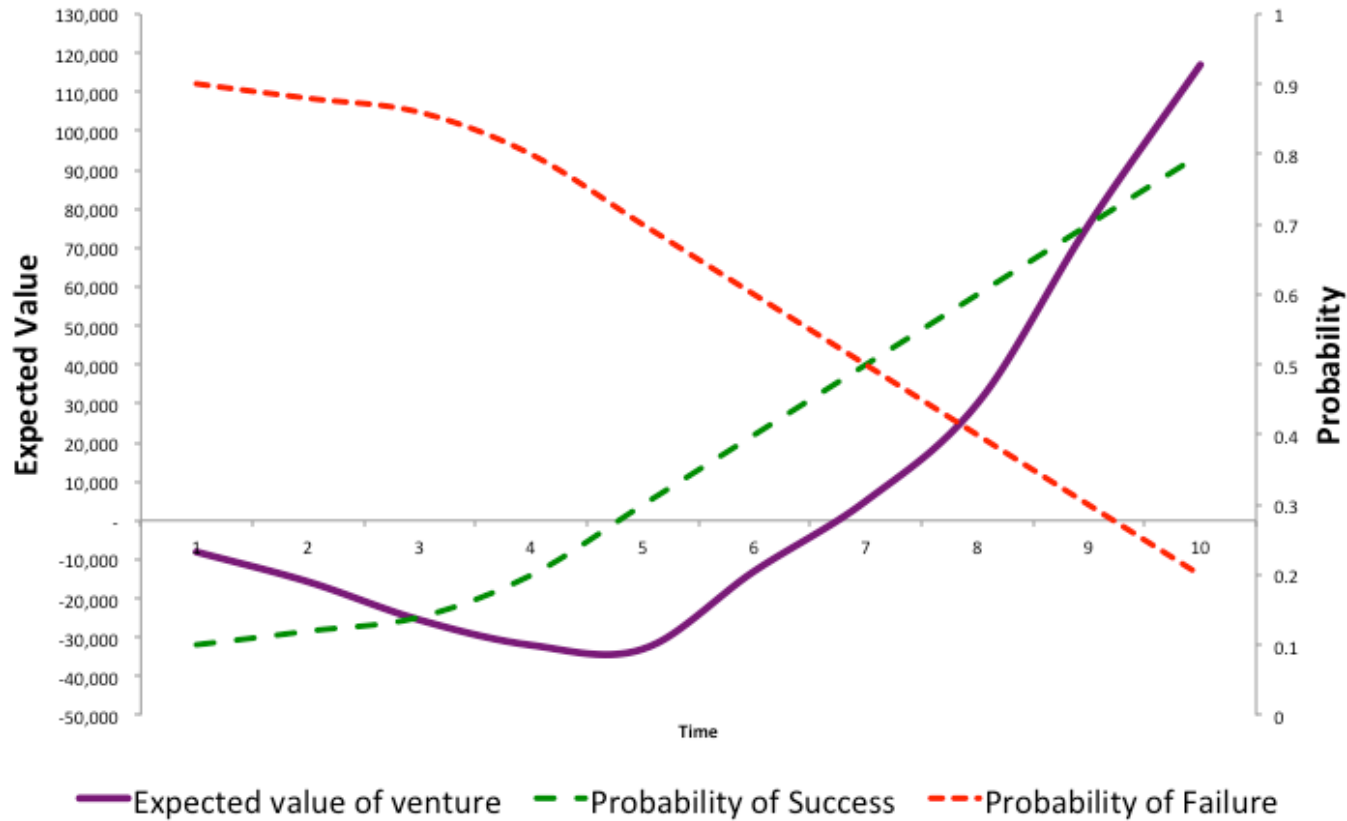
THE GREATER THE UNCERTAINTY THE LARGER THE NUMBER OF COMPETING HYPOTHESES SHOULD BE

EVIDENCE (MULTI-SOURCE)	A	B	C	D	E	F
X	Red	Green	Red	Green	Orange	Red
Y	Orange	Red	Orange	Red	Green	Red
Z	Orange	Green	Green	Red	Red	Red
ψ	Red	Red	Orange	Red	Red	Red



### Structured hypothesis testing as a tool for delivering experimentalist & distributed governance (including risk assessment and management)





$$EV = P_S \times NPV_S - P_F \times NPV_F$$

Where:

$P_S$  = Probability of Success

$P_F$  = Probability of Failure (1-  $P_S$ )

$NPV_S$  = Net Present Value of Success

$NPV_F$  = Net Present Value of Failure

	[1] The presence of friends and relatives in a potential destination country has a positive impact on the likelihood of choosing that country as a destination	[2] A perception of relatively high growth rates in GDP per capita in a potential destination country has a positive impact on the likelihood of choosing that country as a destination	[4] A relatively short indirect (transit country pathways) distance to a potential destination country has a positive impact on the likelihood of choosing that country as a destination	[7] The perception that a potential destination country has positive refugee integration <u>policies</u> has a positive impact on the likelihood of choosing that country as a destination	[14] The perception of a permissive welfare policy stance in a potential destination country has a positive impact on the likelihood of choosing that country as a destination
Source A	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Source B	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Source C	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Source D	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Source E	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>



## Moving forward

1. Be more realistic and honest about limitations to forecasts and predictions, particularly in complex systems environments where simple Newtonian dynamics of linear cause and effect do not apply.
2. Make a more explicit distinction between risk and uncertainty, and doing more to understand the ‘fuzzy’ grey area between the two, again giving due recognition to the inherent unpredictability of complex systems.
3. Put more effort into demonstrating how science translates uncertainty into risk and in so doing increases our levels of preparedness (align with ‘intelligence-based policymaking’ rather than ‘evidence-based policymaking’).
4. Adopt ‘preparedness friendly’ guidelines for research funding and performance evaluation that utilise ‘risk-facilitating’ portfolio-based investment methods.
5. Do more to specify how preparedness outcomes are reflected (in the short term) in greater accuracy in the estimated Net Present Value of economic assets and also (in the very long term) the challenge of being fairer to future generations.

### “We want a lower beta”

- The corporate sector calculates the required rate of return necessary to compensate an investor for the risks faced *relative* to generally prevailing market risks using the coefficient ‘ $\beta$ ’ in what is known as the *Capital Asset Pricing Model* (CAPM):  
$$K_d = R_f + \beta [R_m - R_f]$$

Where

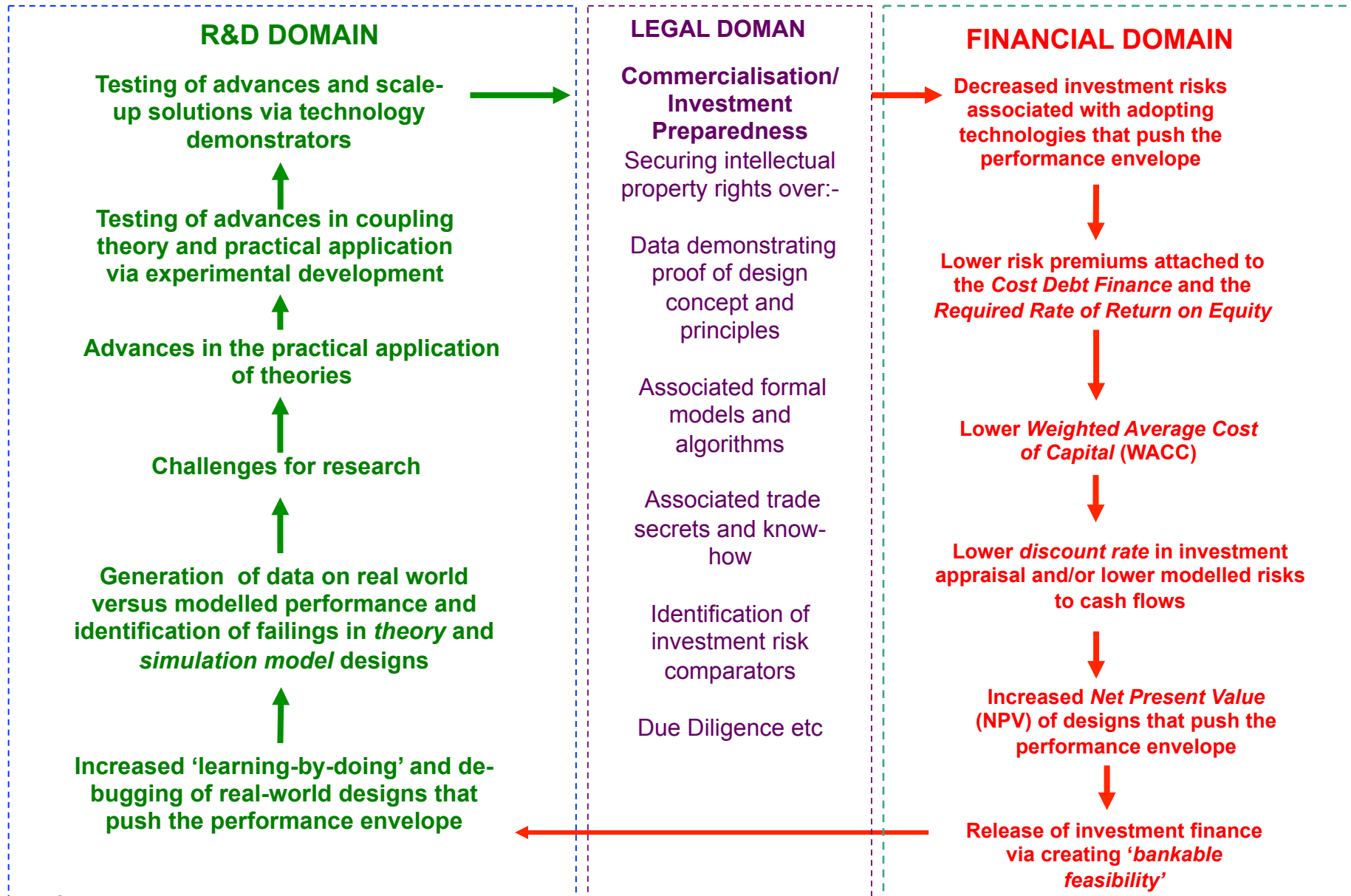
  - $K_d$  = required rate of return from the investment (i.e. the cost of debt)
  - $R_f$  = the risk free rate of return (usually the 10 year govt. bond rate)
  - $\beta$  = the measure of specific project risks relative to general market risks
  - $R_m$  = the expected rate of return prevailing in the market as a whole
- Sophisticated companies seek a lower beta for portfolios of technology ‘options’
- A lower beta is itself a useful outcome from cooperative/collaborative research
- Major impact on the cost of debt and hence the NPV of debt financed investments
- Highlights the importance of whether the commercialisation process is debt financed or equity financed (or how both are mixed)
- DOES NOT ALIGN WITH THE ‘WELL DEFINED PATH THE COMMERCIALISATION’ ETHOS IN CURRENT GOVERNMENT SUPPORT FOR INNOVATION

# HC Coombs Policy Forum

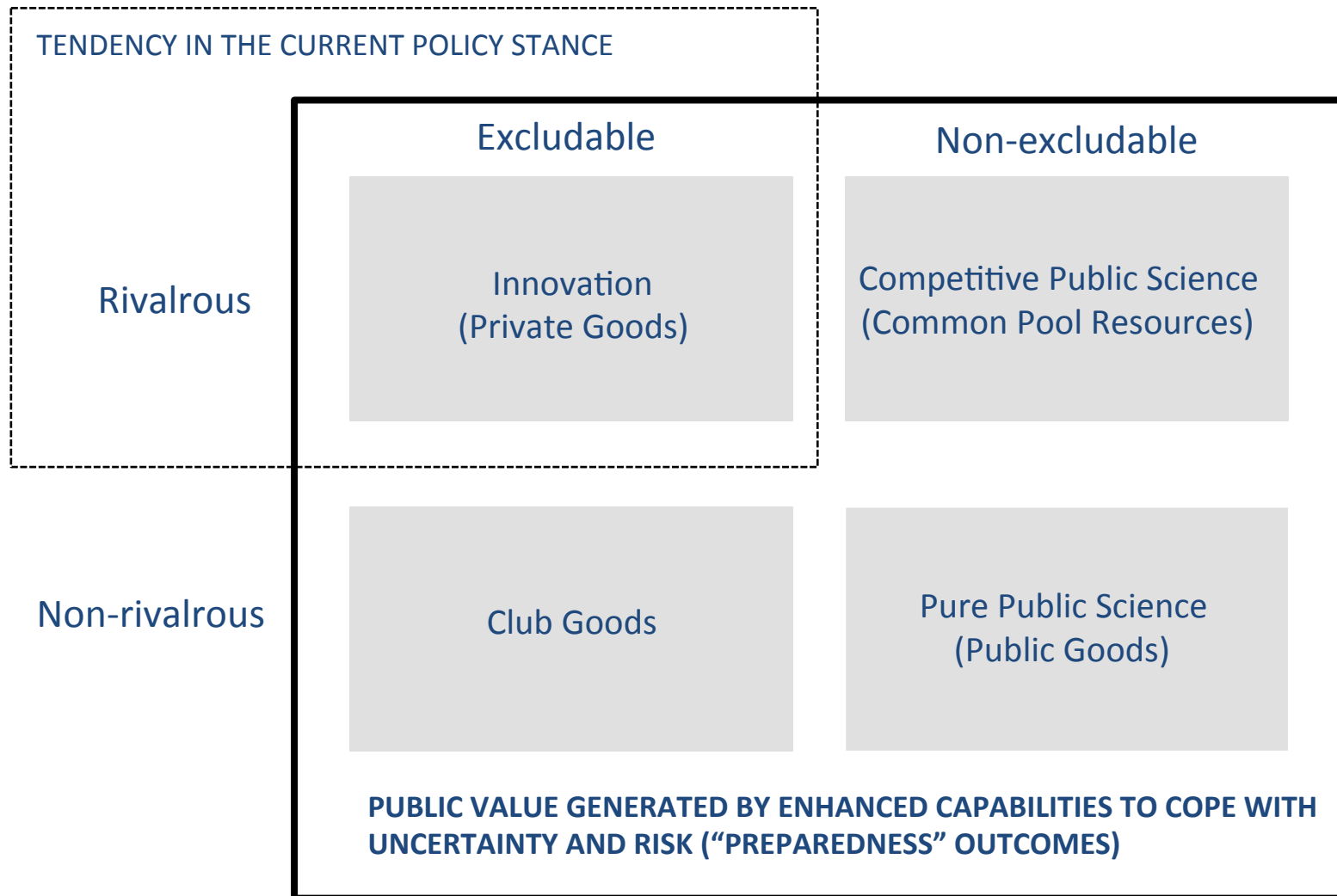
A Joint Australian Government – Australian National University initiative

# Crawford School of Public Policy

Australian National University



**Broaden public value using preparedness as an outcome class supporting intelligence based policymaking as a method**



**END**