Bolstering capacity for more objective & creative thinking within central banks

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*The views expressed in this presentation are my own and do not necessarily reflect those of the Federal Reserve Bank of New York or the Federal Reserve System.

Overview of FRBNY's Applied Critical Thinking unit

Mission

To bolster capacity for objective and creative thinking in the face of complexity and uncertainty

Overview of FRBNY's Applied Critical Thinking unit

Approach

(1) Leverage insights from cognitive science and complex systems theory

- Why do many of our common cognitive and collaborative practices do not support objective and creative thinking under conditions of complexity and uncertainty?
- Why it is very difficult for us to appreciate the shortcomings of these practices in real-time?

Overview of FRBNY's Applied Critical Thinking unit

Approach

(2) Look to fields such as intelligence analysis, design, climate science and medicine for more effective practices

- Through experimentation and iteration, adapt these practices to central banking

Overview of FRBNY's Applied Critical Thinking unit

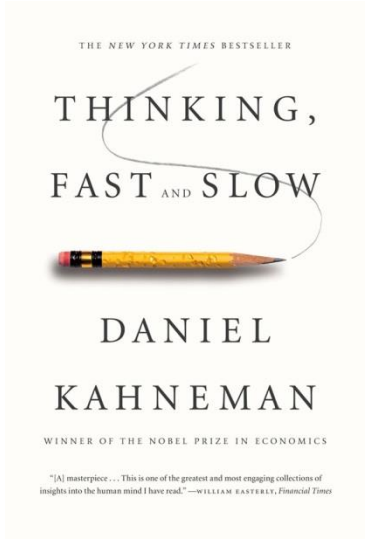
Approach

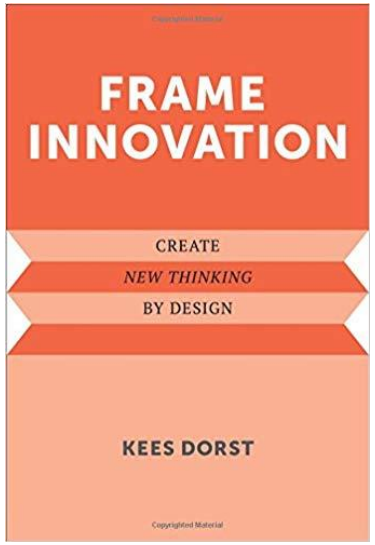
(3) Infuse these new ways of working into the broader organization in safe-to-fail environments

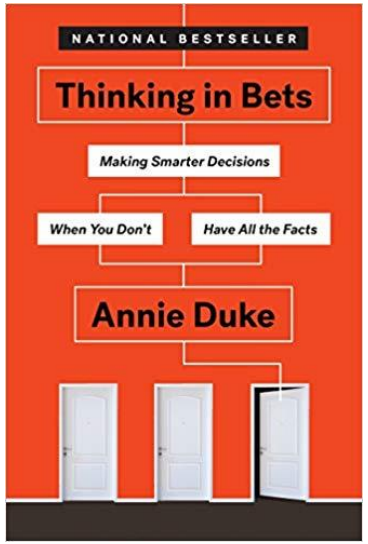
- Focus on a set of core capabilities:
  - being forward-looking,
  - maintaining a wide-field-of-view,
  - confronting ambiguous threats and
  - dealing with "wicked" problems

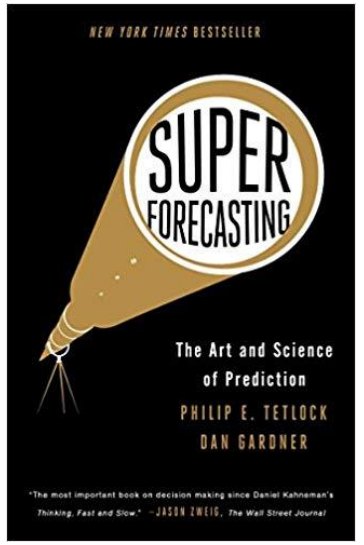
Some inspirational sources

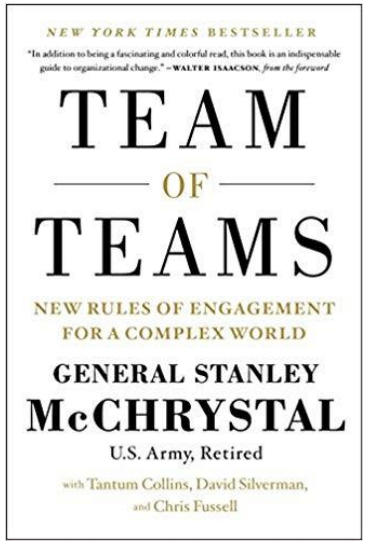
(there are many more)

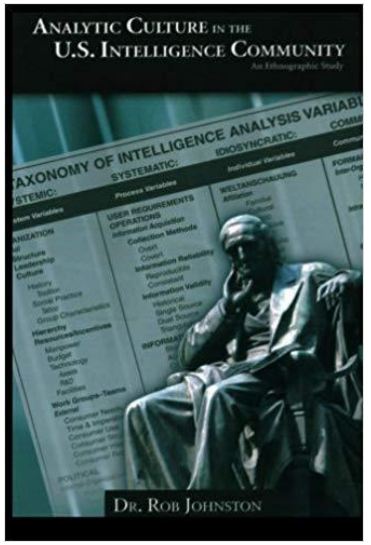


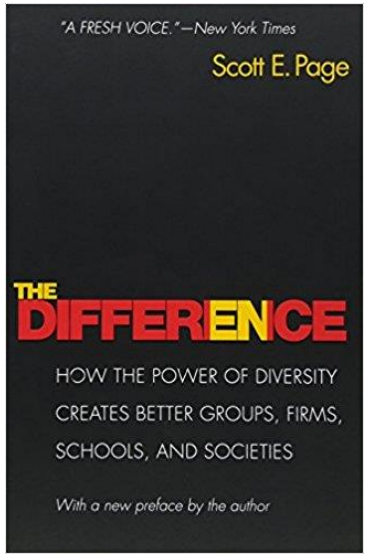












Outline

- What goes “wrong”?
- Why does it matter?
- What can we do about it?

Overconfidence

"What you see is all there is"

"…subjectively, we live in a world that is much simpler than the world out there really is. And that is true for all of us; that is, we all live in a simplified world…

…whenever an event happens, its explanation comes with it immediately. That is, we understand the world even when we couldn't predict it. We understand almost everything after the fact. **We have a story."**

Daniel Kahneman

"…And **this ability to tell stories after the fact and to believe them**…because they come without alternatives—**this feeds a sense that the world makes sense**, the world is understandable."

Daniel Kahneman

"The confidence that individuals have in their beliefs depends mostly on the quality of the story they can tell about what they see, even if they see little.

We often fail to allow for the possibility that evidence that should be critical to our judgment is missing…"

WHAT YOU SEE IS ALL THERE IS.

Daniel Kahneman

"…Furthermore, **our associative system** tends to settle on a coherent patter of activation and **suppresses doubt and ambiguity**."

Daniel Kahneman

"And that leads to **overconfidence**.

Overconfidence [occurs] because it's quite often extremely **difficult to imagine alternatives** to the way that you think…"

Daniel Kahneman

"…when I see this glass full of water, I know it's there. I mean, it's reality. And I'm sure you see it too, because I assume that you see the same reality that I do.

Now, about this glass it's probably true, but the same kind of false consensus…works out in many situations of decision-making…where there are large differences among people that they're not aware of…**and they can't imagine those differences**…"

Daniel Kahneman

Key points

- Kahneman is ultimately talking about what it means for something to "make sense" to us, and he is contrasting **associative coherence** with **logical coherence.**

- We rely on the former much more heavily than we realize (even when we are having highly sophisticated and technical discussions).

- This reliance "works" well in environments with a high degree of regularity, but it works less well in what he calls "low validity environments". (We'll come back to the implications of this for central banks)

Motivated cognition

Fitting “world-to-mind” rather than “mind-to-world”

In the 1950s, psychologists asked experimental subjects--students from two US Ivy League colleges--to watch a film that featured a set of controversial officiating calls made during a football game between teams from their respective schools.

The students from each school were more likely to see the referees' calls as correct when it favored their school than when it favored their rival.

The researchers concluded that the emotional stake the students had in affirming their loyalty to their respective institutions shaped what they *saw* on the tape.

Motivated cognition refers to the unconscious tendency of individuals to fit their processing of information to conclusions that suit some end or goal.

The **end or goal** *motivates* the cognition in the sense that it **directs mental operations**—in this example, the mental operation was sensory perception, but it could also be assessments of the weight and credibility of empirical evidence, or performance of mathematical computation.

The point is that we tend to think of these mental operations as functioning independently of that goal or end, but they often don't.

Source: Dan Kahan, Elizabeth K. Dollard Professor, Yale Law School

And, as with our reliance on associative processing, **we aren't aware that our thinking is "motivated" by any end goal other than truth-seeking**. This is known as:

THE ILLUSION OF OBJECTIVITY

What does all this have to do with central banking?

Two working hypotheses

1

Central bankers are people too

(central bankers are subject to overconfidence and motivated cognition just like everyone else is)

2

If central banking were a game (it isn't), it would be poker, not chess

(chess is complicated, poker is complex)

Complicated

A problem in a complicated system can be difficult to diagnose, and difficult to solve. But it can be diagnosed and solved, and the system will provide timely and unambiguous feedback on the quality of the diagnosis.

With practice, it is possible to "master" a complicated problem

The stories people are telling ex ante will generally line up with the way things played out ex post.

Complex

A problem in a complex system can be difficult to diagnose and difficult to solve, the system will not provide timely or unambiguous feedback on the quality of the diagnosis or solution.

It is never possible to completely remove the element of chance when dealing with complexity, you have to look for ways to test your understanding, the patterns can be misleading

The "reality" of the system at any moment can often only be ascertained with hindsight and that hindsight often gives us little insight into how to

If central banking were a game (it isn't), it would be poker, not chess

chess

Outcomes provide clear feedback on my performance (my skill)

I can learn effectively (improve my performance) through experience alone

poker

Because outcomes can be attributed to either luck or skill, they provide ambiguous feedback on my performance (my skill)

I *cannot* learn effectively (improve my performance) through experience alone, I need to do more

What does the presence of luck (uncertainty) have to do with how I learn (effectively)?

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The presence of luck (uncertainty) makes it hard for me to find out the truth about my skill

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For example, what happens to my skill if every time I win I attribute the victory to my skill and every time I lose I attribute the loss to bad luck?

Why would I do this???

I wouldn’t do it on purpose

But, I don’t realize I’m doing it

Humans are good at suppressing ambiguity and telling ourselves stories

Implications for central banking

- Central banks operate in a “low validity environment”, which means it is difficult for us to receive unambiguous, real-time feedback on our judgment and decision quality
- Phenomena such as overconfidence and motivated cognition can thrive in low validity environments, absent effective mitigation efforts

Implications for central banking

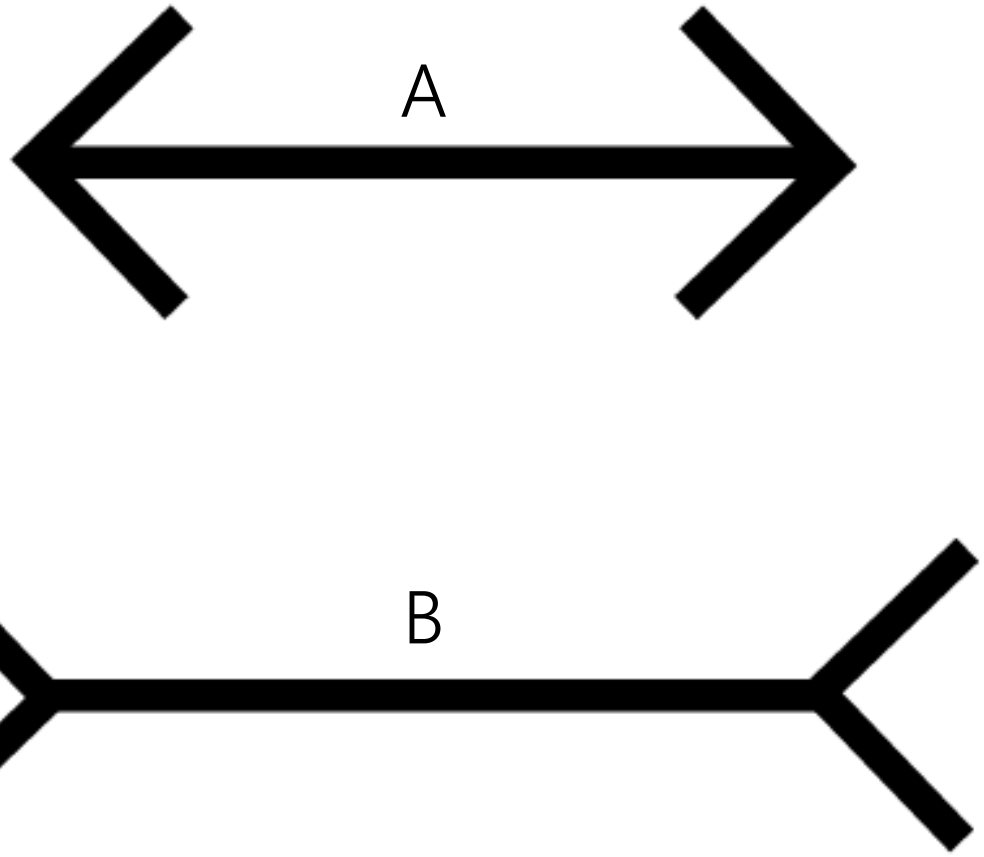
- There are a range of disciplines—intelligence, medicine, climate science, design and others--that make a more systematic effort to confront the interplay between human cognitive bias and the complexity of the environment.
  - These disciplines provide us with a variety of approaches that can be adapted to central banking
- Meaningful progress on this front requires us to confront some of the **paradoxes** that make these problems hard to solve in the first place

Paradox #1

WHAT DOES IT FEEL LIKE TO BE WRONG?

IT
FEELS
LIKE
BEING
RIGHT

We can’t rely on individuals to “fix” the problem of bias themselves, but we can use the organization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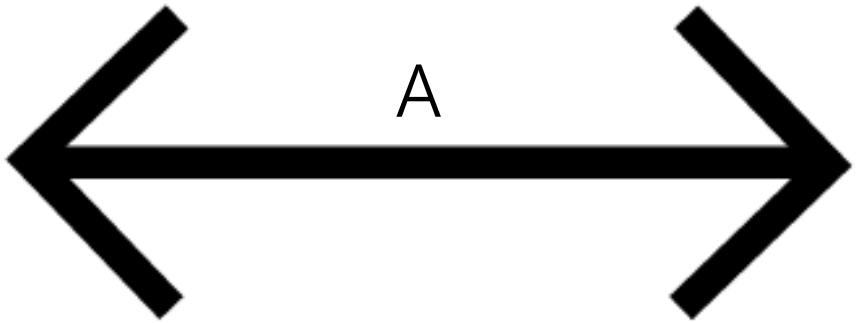
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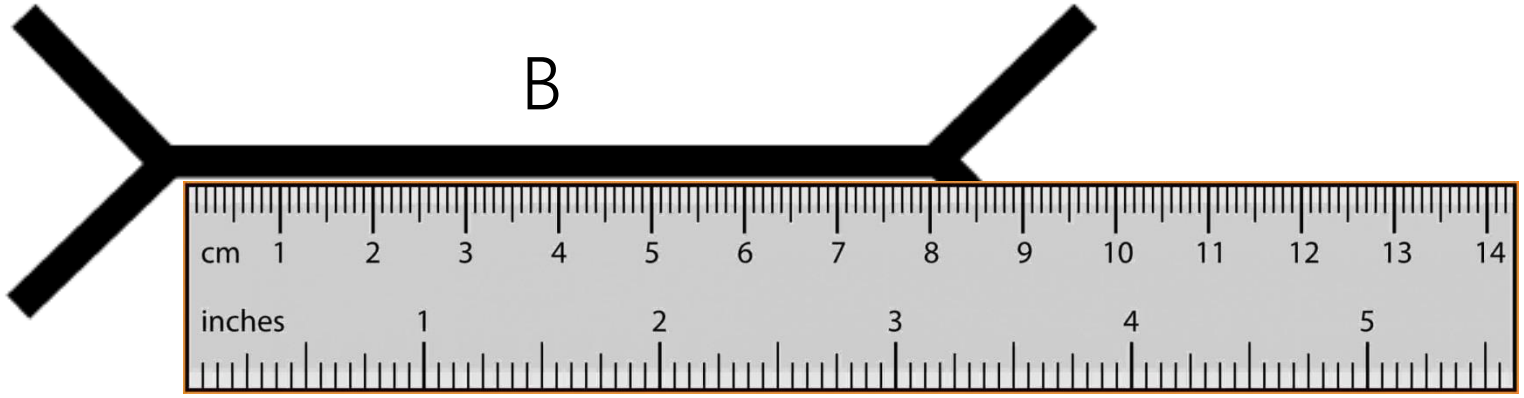
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Paradox #2

Reducing epistemic uncertainty (uncertainty related to your state of knowledge) can trigger an increase in psychological uncertainty.

We have to find ways to make uncertainty, ambiguity and doubt a generative experience rather than a negative experience

Paradox #3

In principle, people and organizations value creativity. At the same time, creative ideas are by definition novel, and novelty can trigger feelings of uncertainty that make most people uncomfortable.

Anti-creativity bias is so subtle that people are unaware of it, which can interfere with their ability to recognize a creative idea.*

We have to find new ways to foster & reward creativity

Source: Mueller, Melwani and Goncalo (2011)

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Paradox #4

We get rewarded for having answers, for playing our role in establishing certainty, but it's actually when people say "I don't know", when they step into not knowing and explore from there, that we move forward.*

We have to create a culture of intellectual humility

Source: The Net and the Butterfly (2017)

Drawing on approaches from other disciplines

Intelligence analysis

- Forecasting tournaments
- Structured analytic techniques

Climate science

- Uncertainty maps (level, nature, location)

Medicine

- Morbidity & mortality exercises

Design

- Externalization tools
- Ethnographic research tools
- Problem (re)framing
- Use of synthesis methods (abductive reasoning tools)
- Techniques for breaking “fixation”

Investigative journalism

Aviation safety

Interdisciplinary studies

- Key mindsets
- Metacognitive practices

Manufacturing product testing

Forecasting tournaments

An approach to inquiry that produces higher-quality and more timely feedback on the accuracy of our insights into a complex policy environment

Based on tournaments conducted by **I**ntelligence **A**dvanced **R**esearch **P**rojects **A**ctivity (IARPA) in the US over recent decades

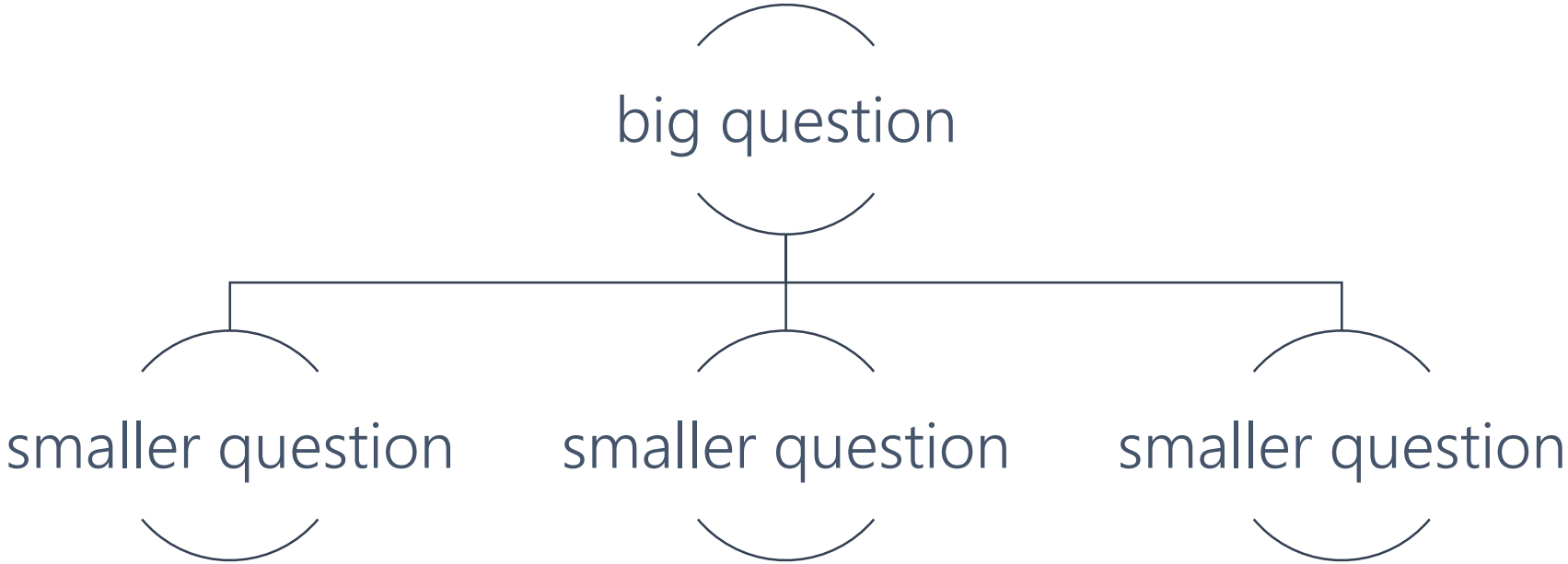
Where do the questions come from?

The “big” things that we want to understand and anticipate (i.e., what’s going to happen with…?)

→ The many smaller questions that are nested in the big questions

→ The things that can be actually be measured (i.e., for which uncertainty can eventually be resolved)


big question


big question
smaller question
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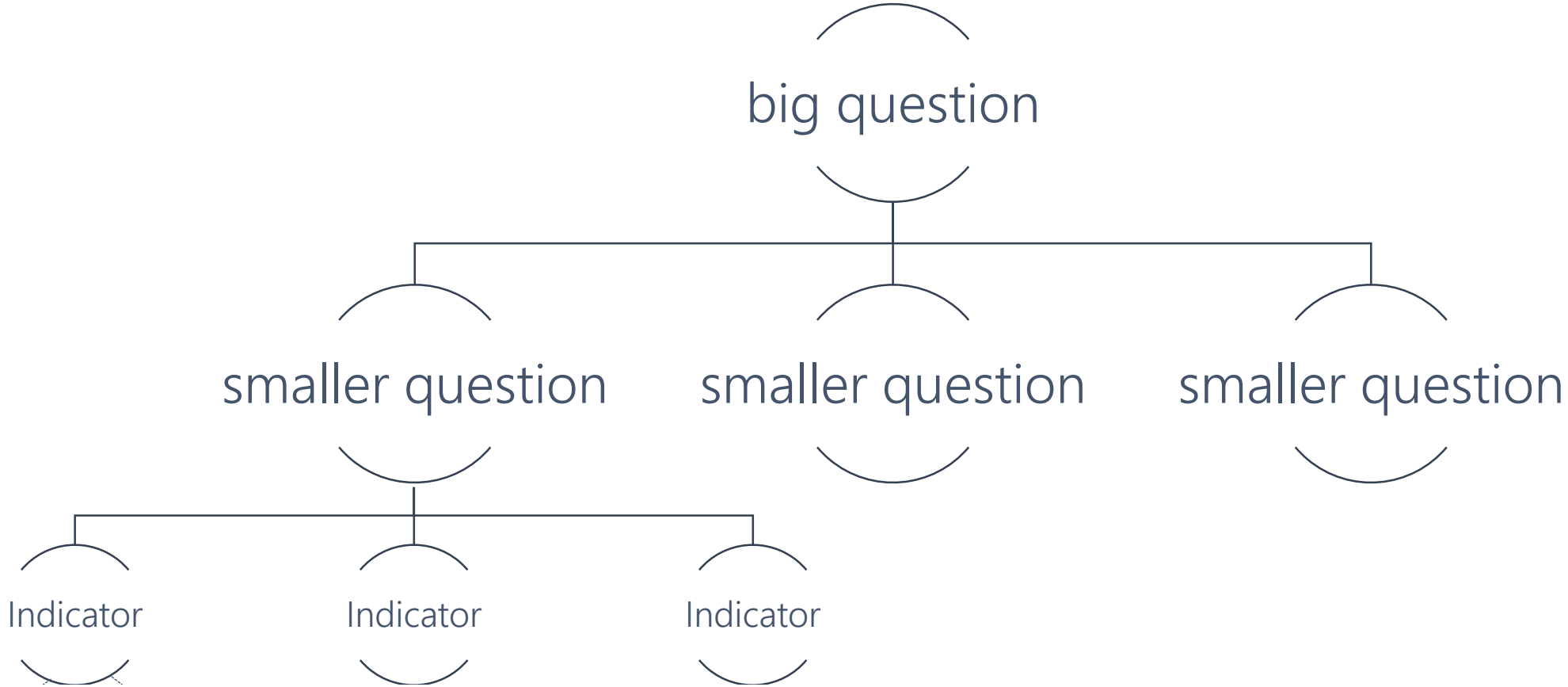
smaller question


big question
smaller question
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smaller question
Indicator
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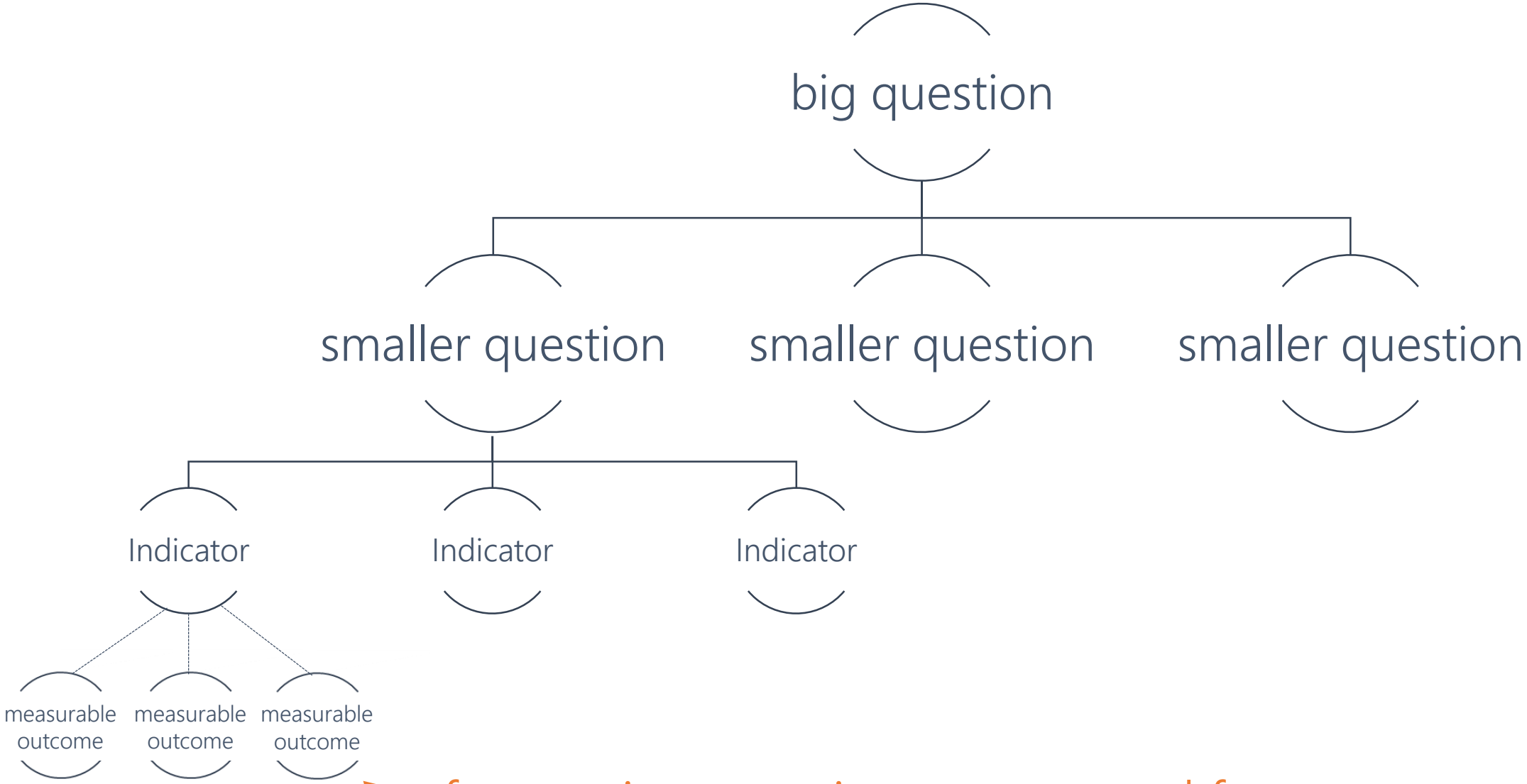

forecasting questions are created from these (need to satisfy the “clairvoyant test”

Examples of big questions related to FinTech

1) How will FinTech impact consumer access to financial services?
2) What will be the future of cash usage in the US?
3) Will decentralized, trustless cryptocurrencies be widely adopted as a means of payment?
4) What role will BigTech firms play in the provision of financial services?
5) How will AI/ML technology impact the financial services industry?

Key elements of forecasting tournaments

- Participation is open to all individuals
  - Individuals submit their own forecasts, but work in diverse teams to develop their forecasts
  - Allows us to better integrate knowledge across domains within the organization
- Questions reflect areas of interest for the organization
- Effective technology interface
- Scoring reflects both process goals and accuracy goals
- Use of metacognitive practices

Benefits of forecasting tournaments

The process of creating questions give us a structured and compelling way to bridge the gap between the "big" things we want to know and the things we can actually observe and measure

- Reduces reliance on "vague verbiage"
- Requires us to ask, how does this really work?
- Supports an atmosphere of adversarial collaboration

The process of creating forecasts gives us the incentive to more regularly engage in **probabilistic thinking**

- Requires deliberate externalization, calibration and ongoing updating of our underlying beliefs

Benefits of forecasting tournaments

Overall, the tournament:

- Gives us a tractable structure for disrupting our reliance on associative coherence
- Leans against overconfidence and the associated phenomena of "bounded awareness"
  - Inattention blindness
  - Change blindnesss
  - Focalism and give us a structured and compelling
- Leans against motivated cognition
  - Moves us away from "all or nothing" thinking and toward beliefs that are more calibrated to the available evidence
- Promotes an culture of intellectual humility