



SUPPORT TOOL FOR EFFECTIVE PROCUREMENT STRATEGIES

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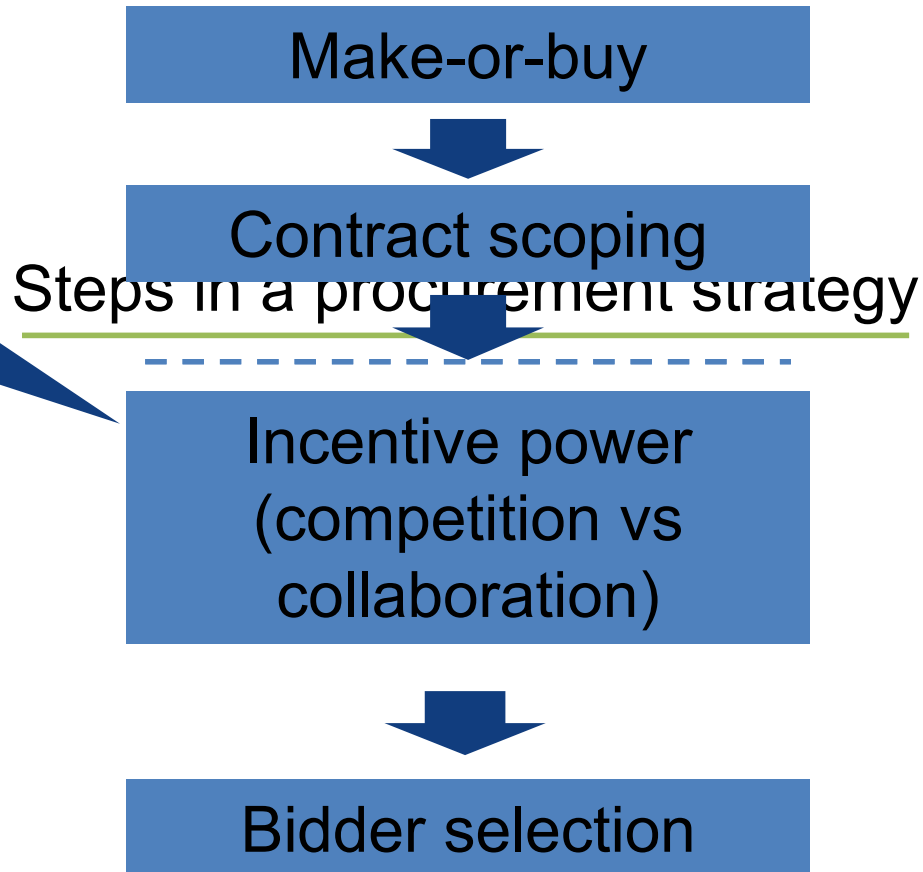


Points I picked up from a recent event with leading infra organisations

- Interfaces are the no. 1 evil, larger contract scopes (horizontally and vertically) are the answer
- Two bidders are a (sufficient) competition!
- And if competition with large contracts can't happen, let's collaborate!



What do we mean by “complete procurement strategy”?



(judgmental)

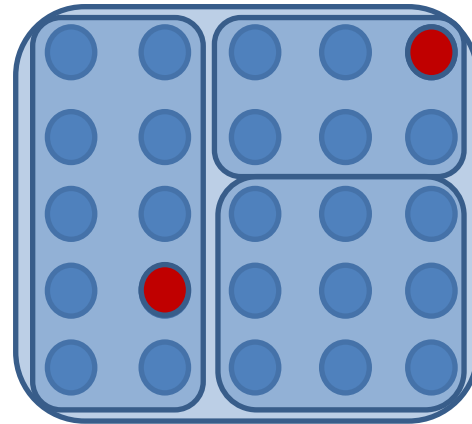
(judgmental)
How a decision is made

(basic guidance/judgmental)

(scientific & enshrined in legislation)

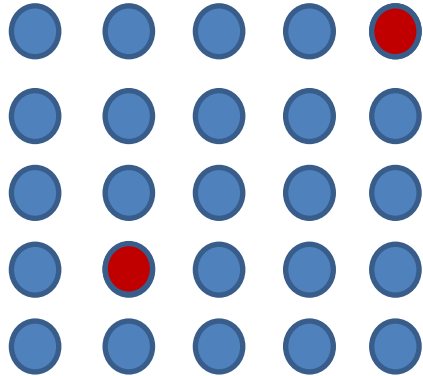


Why is the make or buy (&contract scoping) so important?



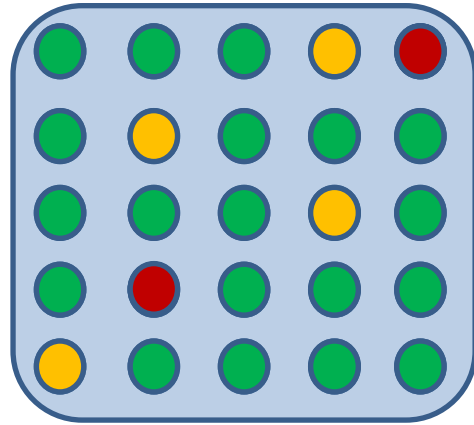


... and after that the challenge of hold-up matters?





...and only then can we discuss risk allocation





Procurement failures

Pre-contract failures

- Competition failure
(Too few bidders)

Contract signature

Post-contract failures

- Hold-up
- Inadequate risk allocation
(e.g. one size fits all
commercial arrangement)



The approach the OECD is piloting

**How does the Support Tool for Effective
Procurement Strategy – STEPS work?**



Pre-STEPS preparation

Must have's

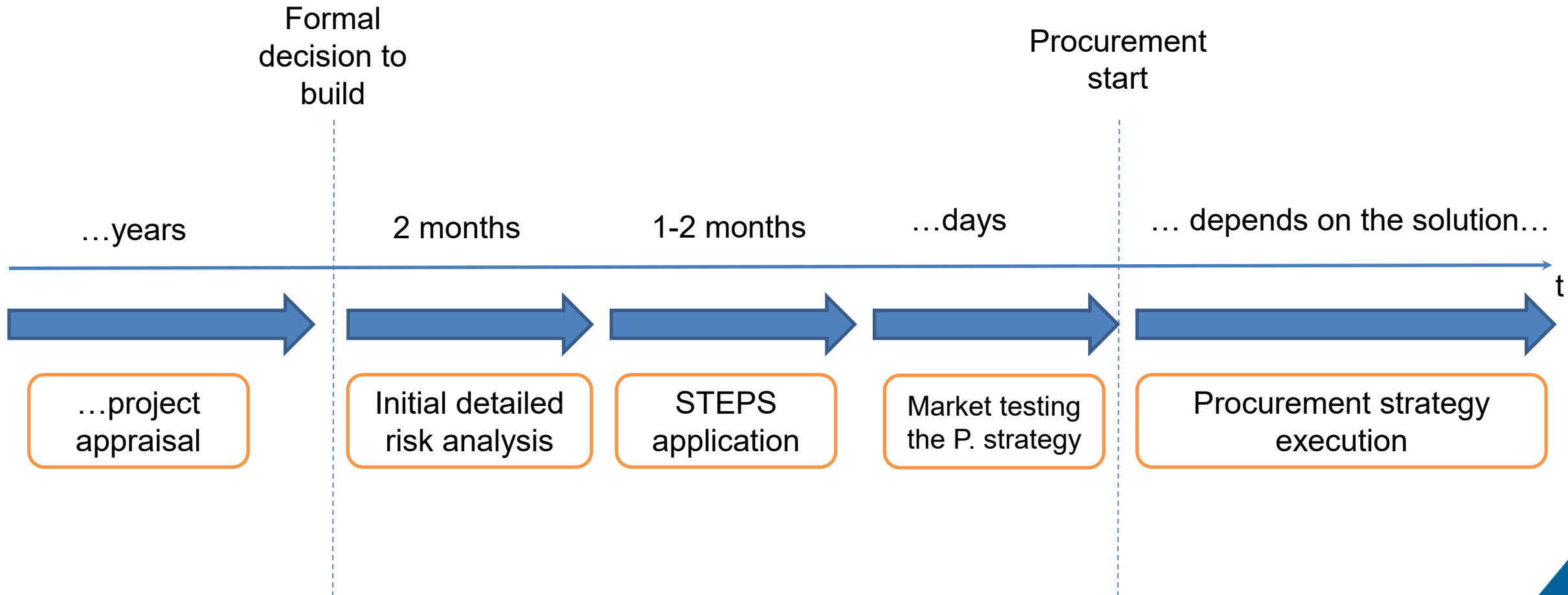
- A feasibility study/outline design is available (e.g. railway alignment with main structures – RIBA 0 or 1)...

Good to have's:

- An initial detailed risk analysis (a risk register tracking risks (technical, permits, environmental...) and mitigation measures for each task.



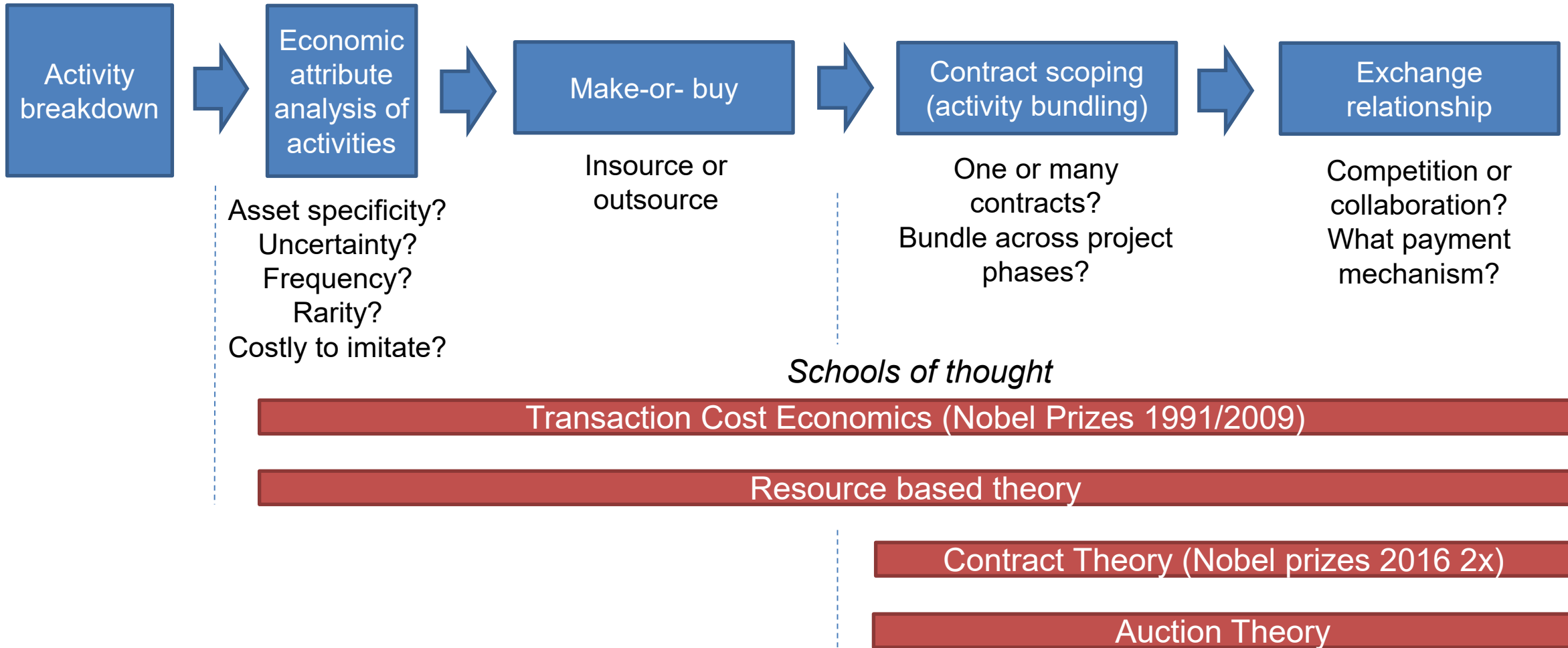
Project preparation cycle and STEPS



Example: EUR 200M project



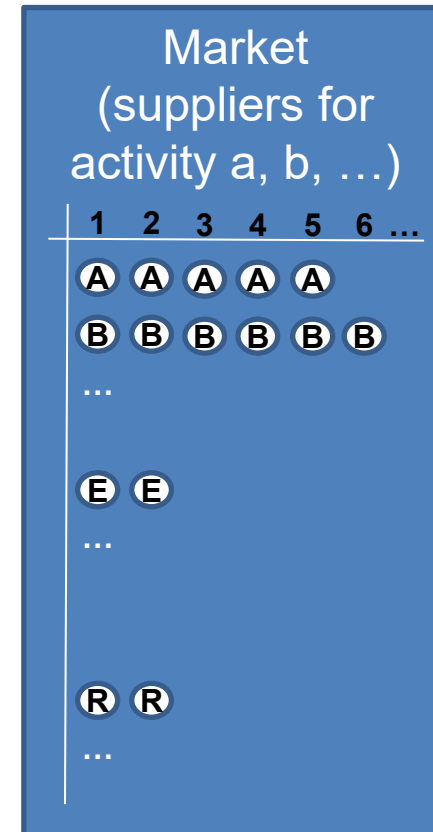
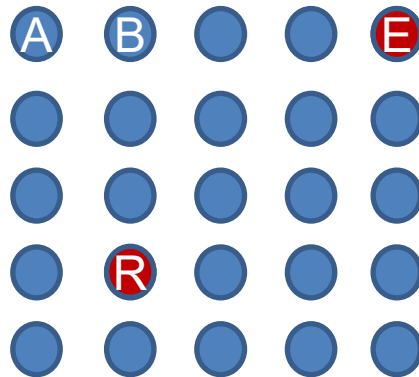
The analytical process in STEPS





Breaking down a project into STEPS activities

- STEPS activity =
 - economic activity (not detailed technical task)
 - technologically bounded (skillsets)
 - highest level of firm specialization



28 x Design Activities*(Project Specific Activities)*

- Environmental studies (remaining)
- Engineering survey (remaining)
- Geotechnical design (remaining)
- Structural design
- Fire engineering
- Hydraulic engineering
- Drainage design
- Inspection and maintenance design
- Blasting design
- Road safety design
- Geometric Road design
- Pavement design
- Landscaping design
- Road lighting design
- Noise treatment design
- Bridge design
- Dust management plan
- Services design
- Culvert design
- Intersection design; Ramp entrance and exits design; Provisions for pedestrians and cyclists
- Demolition plan
- Traffic management; Signals; Signs design
- Tunnel activities (x6)

26 x Construction Activities*(Project Specific Activities)*

- Site establishment and site clearance
- Piling
- Pile cap
- Bridge Substructure (piers, abutments, wing walls, backwalls)
- Bridge Superstructure
- Earthwork
- Guardrail and handrail and road furniture
- Bridge sign installation
- Services installation
- Trenches/Drainage
- Stabilising agent
- Pavement construction (Subgrade, Subbase, Base, surfacing)
- Road marking
- Culverts
- Signs
- Traffic signal equipment
- Landscaping
- Demolition works
- Noise treatments
- Tunnel activities (x7)

11 x Operations Activities*(Network Activities)*

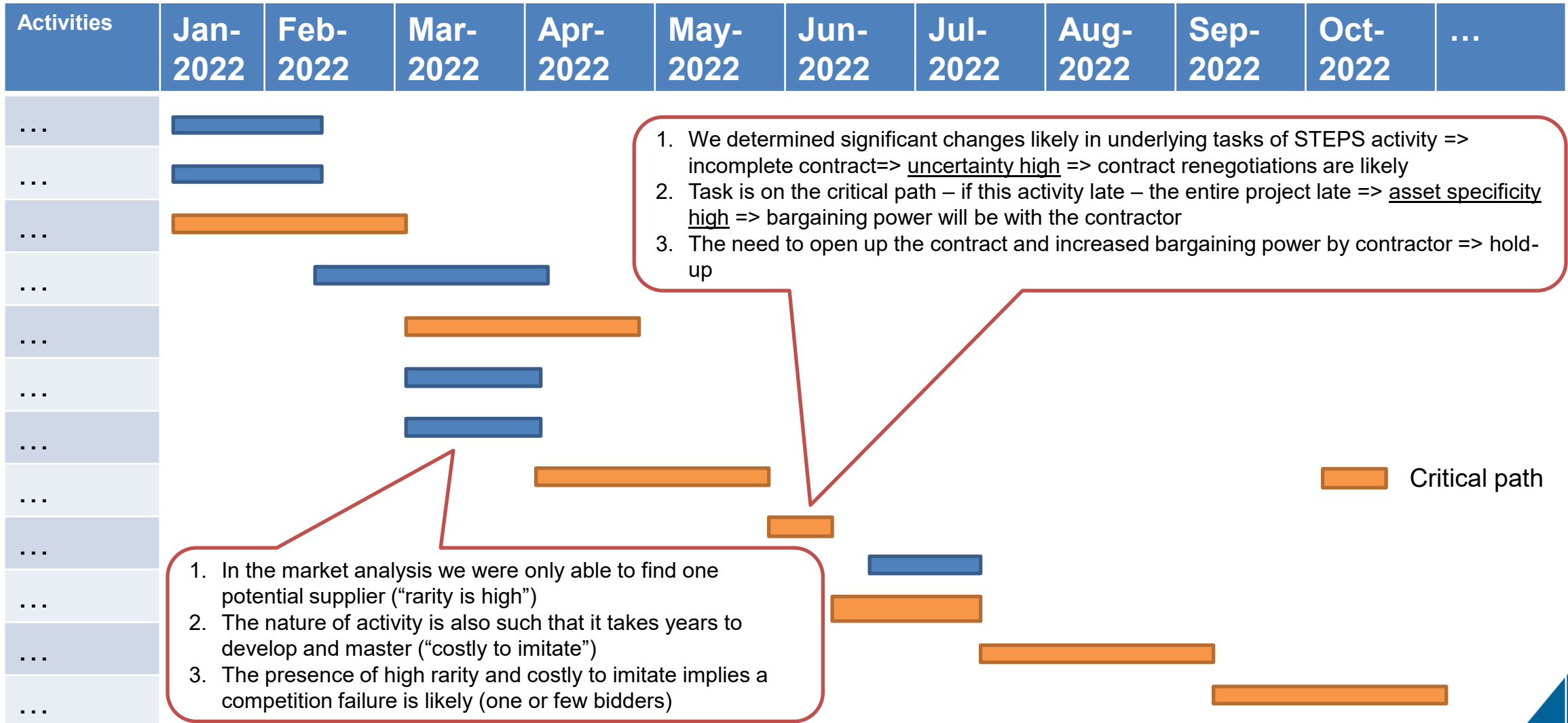
- Traffic management services
- Network control services
- Operation liaison with police and other emergency services
- Clearing of pavement (includes snow)
- Clearing of ditches and culverts
- Removal of debris or obstacles
- Tunnel activities (x5)

15 x Maintenance Activities*(Network Activities)*

- Inspections
- Mowing and plants
- Pothole patching and crack sealing and resealing
- Repair of sealants and expansion joints of bridges
- Traffic signs and road markings
- Repair of damage caused by traffic accidents
- Repair of cut and fill slopes
- Resealing/surface dressing
- Tunnel activities (x7)



Economic attribute analysis example





Properties are evaluated and each activity can only fit one pattern...

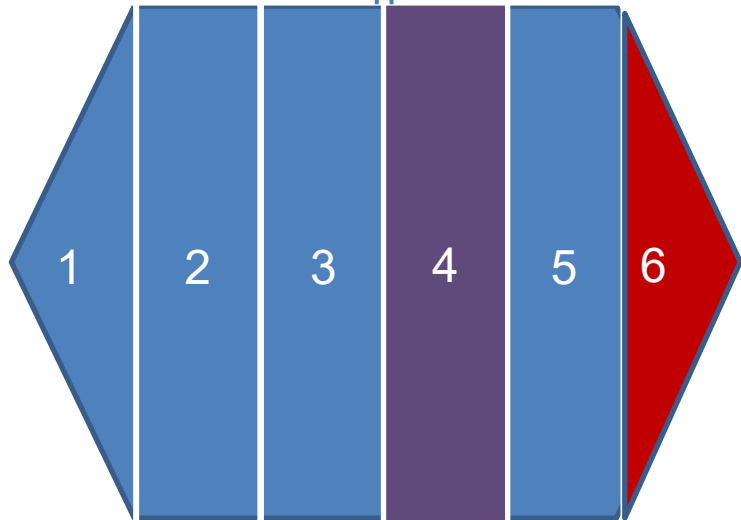
Pattern	The capability spectrum (who is better positioned to deliver an activity)	Supplier bargaining power (TCE)	Uncertainty (TCE)	Frequency (TCE)	Rarity (RBT)	Costly to Imitate (RBT)	Governance (Make-or-Buy)
1	The buyer is far better	<p>Is there a danger of hold-up?</p>	<p>Is frequency high enough to consider insourcing?</p>	<p>Does the level of uncertainty suggest competitive or collaborative delivery models?</p>	<p>How many bidders are we likely to get?</p>	<p>What is the distance in capabilities between the procuring entity and its suppliers?</p>	Internal
2	The buyer is better						Internal
3	The buyer is just as good, hold-up managed through insourcing						Internal
4	The supplier is just as good, hold-up managed through contract						External
5	The supplier is better						External
6	The supplier is far better						External



How the activity properties interact gives six states of the market or bargaining positions

Make

Buy



Hold-up is the primary concern;
competition is not an issue

Neither hold-up nor competition
are serious issues

Competition failure is the primary
concern; hold-up can occur as well

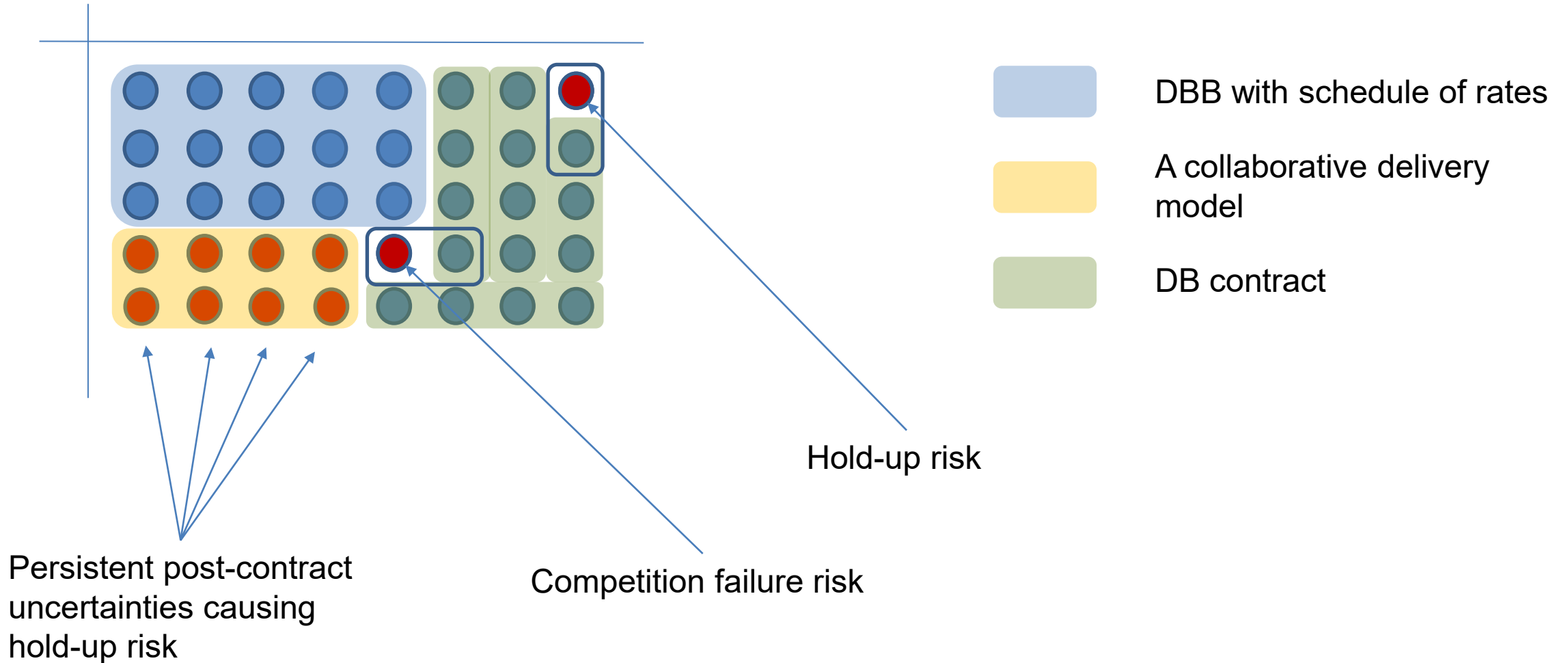


The core of the analysis is similar to a shape matching toy... but shape needs to be determined first





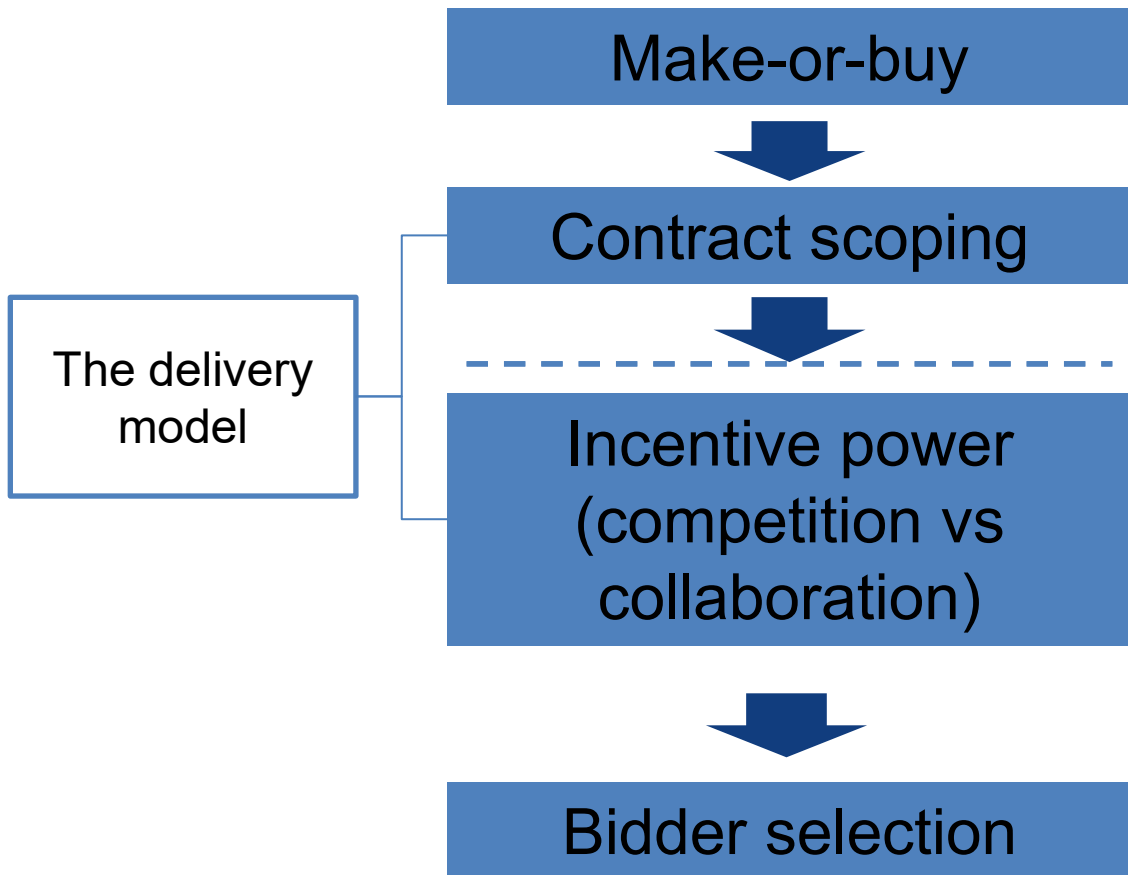
Procurement strategy solution for project X





What do we mean by “complete procurement strategy”?

Steps in a procurement strategy



How a decision is made

(scientific)

(scientific)

(scientific)

(scientific & enshrined in legislation)



Desired Outcomes

- Lower cost
- No increase or reduction in conflict/litigation with contractor
- No major loss in innovation potential



The method was so far used on 8 major projects

- Roads, hospitals, and a railway crossing in Australia
- Recent STEPS application on EUR500 of road infrastructure in Norway: https://www.oecd-ilibrary.org/governance/procurement-strategy-in-major-infrastructure-projects_38996343-en
- Brochure: <https://www.oecd.org/gov/infrastructure-governance/STEPS-brochure-april-22.pdf>



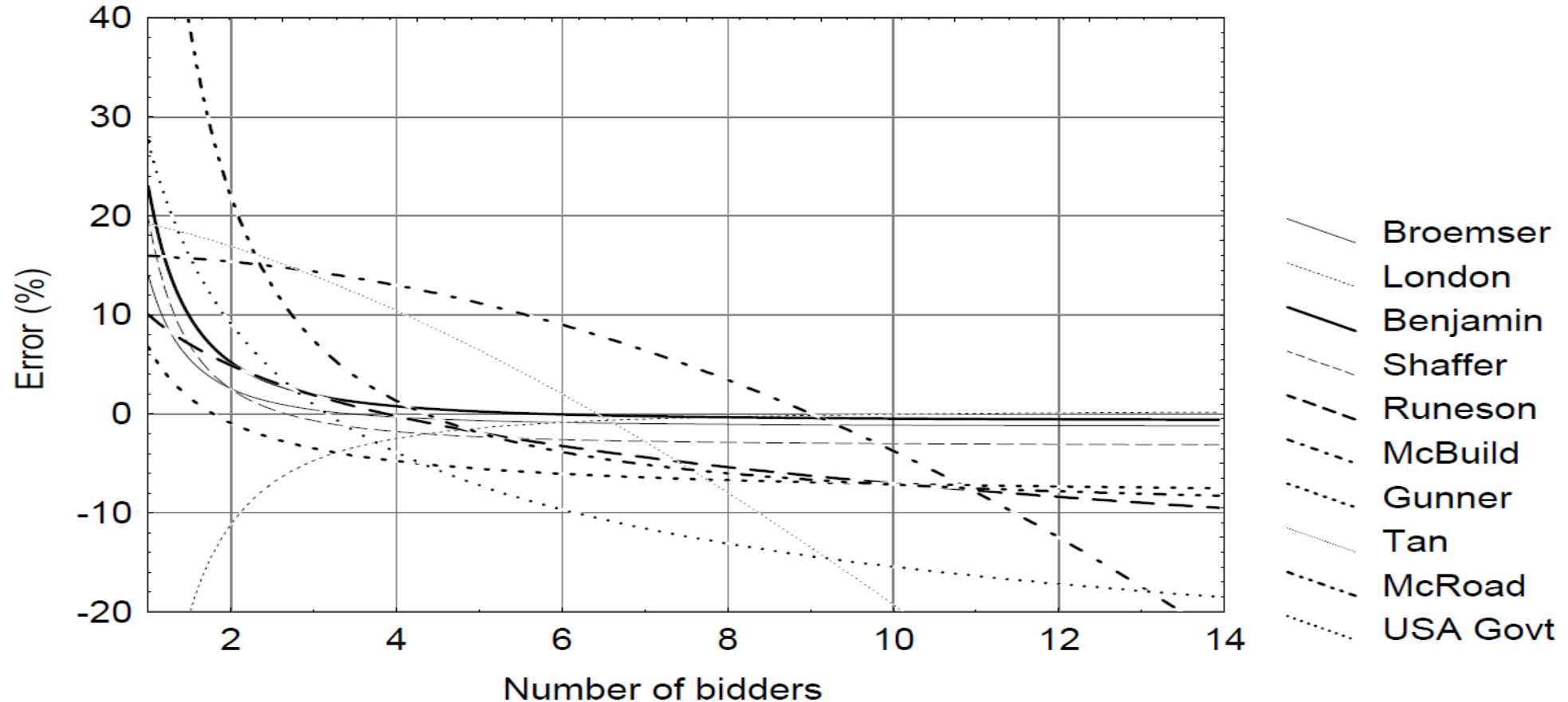
THANK YOU
DEJAN.MAKOVSEK@OECD.ORG



Reserve slides



Competition does matter and 2 bidders is not good!



Notes: The “Error %” represents the difference of the lowest bid compared to the tender estimate (the reserve price). The names of the curves represent different datasets.

Source: Skitmore (2002).



How are delivery model decisions made in practice (II)

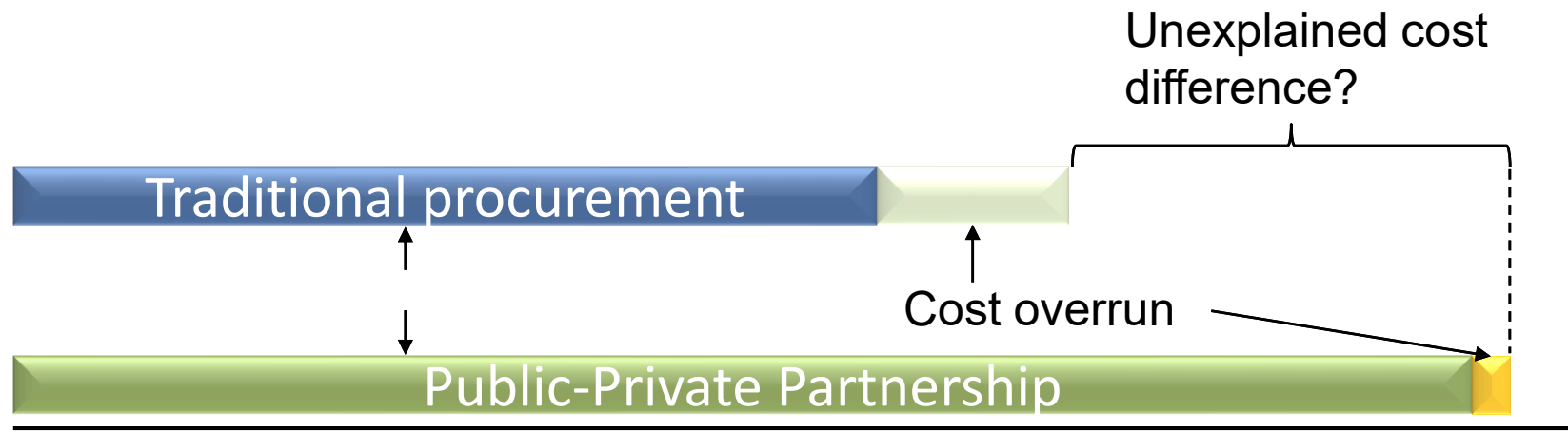
	Importance of Criteria in Rows	Design-Bid-Build (Traditional)	Design&Build	PPP (DB/EPC)	Early Contractor Involvement
Speed of delivery	0.2	+	+++	+	++
On time delivery	0.2	+	++	+++	+
On Budget delivery	0.3	+	++	+++	+
Innovation potential	0.2	+	++	+	+++
Suited for complex projects	0.1	+	++	++	+++

Note: The values entered are for illustration purposes only and do not necessary reflect relative delivery model performance.



One size fits all applications of delivery models are also not a great idea

- Construction risk: risk premium in 57 DB/EPC road contracts ~20% above ex-post risk in 101 DBB contracts (LCC does not explain diff.); based on Blanc-Brude et al 2009.



Source: Makovšek & Moszoro 2018.



More on the issues treated so far...

Procurement Choices and Infrastructure Costs



Dejan Makovšek & Adrian Bridge

<https://www.nber.org/books-and-chapters/economic-analysis-and-infrastructure-investment/procurement-choices-and-infrastructure-costs>



There also seems to be a lack of understanding of bundling/collaborative model trade-offs...

- Assuming serious efforts were made by the client to reduce pre-contract uncertainty...
- In an average project the issues with the design errors (e.g. constructability) and omissions are insufficient to offset the premia of increased pre-contract uncertainty and lump-sum requirement.
- Bundling therefore only justified if it yields superior solutions to the counterfactual!
- A point even more critical on collaborative models, which sacrifice competition in construction!



Exchange relationship also follows from the matrix...

Pattern	The capability spectrum (who is better positioned to deliver an activity)	Asset Specificity (TCE)	Uncertainty (TCE)	Frequency (TCE)	Rarity (RBT)	Costly to Imitate (RBT)	Exchange relationship
4	The supplier is just as good, hold-up managed through contract	High	High	Low	Low	Low	Collaborative contracting/ target price
5	The supplier is better	Low or High	Low	Low	Low	Low	Context dependant: Lump sum/best value competition, or Rate based
6	The supplier is far better	Low or High	Low or High	Low	High	Low or High	Rate-based competition in all cases

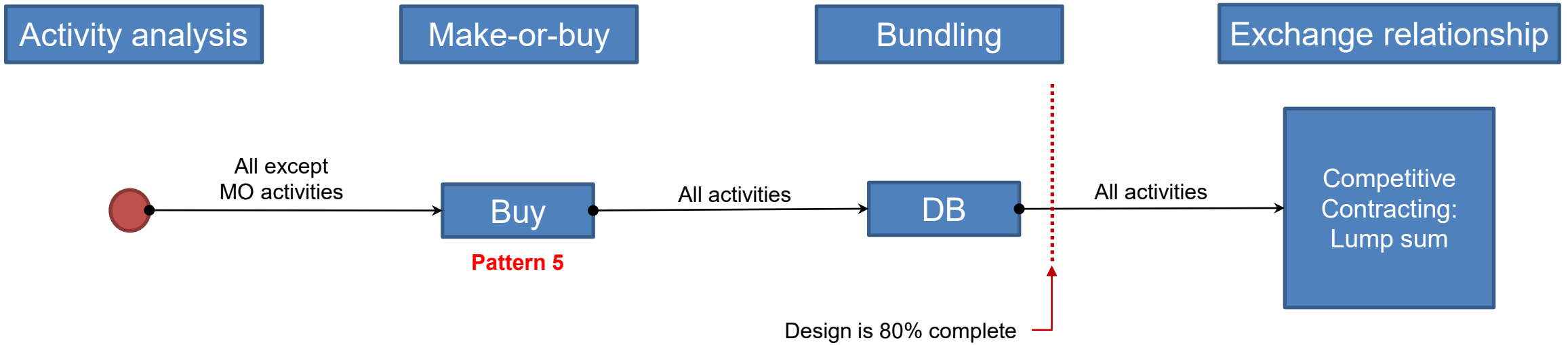


Example - the E18

- 16.5 km of 2x2 motorway
- 27 constructions including 15 bridges
- Contract signed in May 2017. Opened for traffic in December 2019.
- Norwegian incumbent won with PL bridge specialist (subcontractor). Winning bid \approx EUR190 million.



E18 in Norway – analysis outcome example



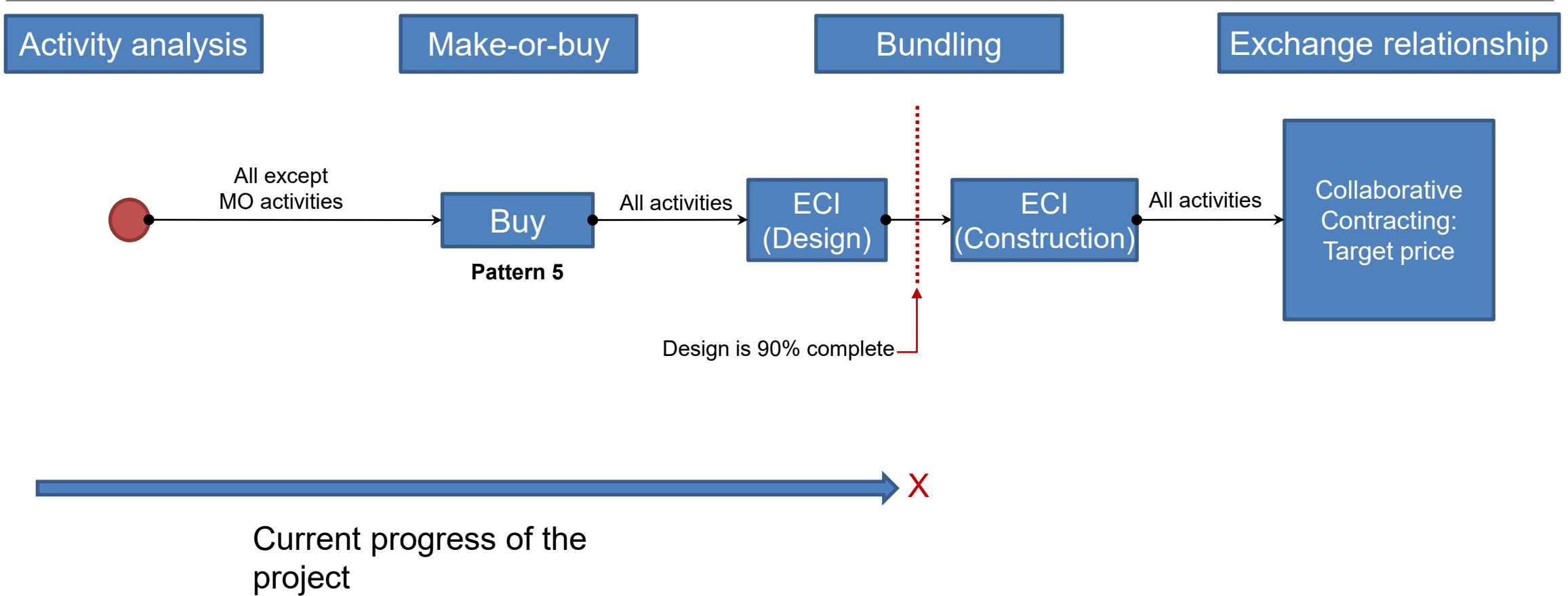


Example - the E6

- 25 km of 2x2 motorway
- 30+ constructions, including 2 main intersections, 2 short tunnels
- Phase 1 Nov 2019, Phase 2 May 2021 (opening 2025)
- Project budget included in the tender - target price=contract value = EUR 261 million

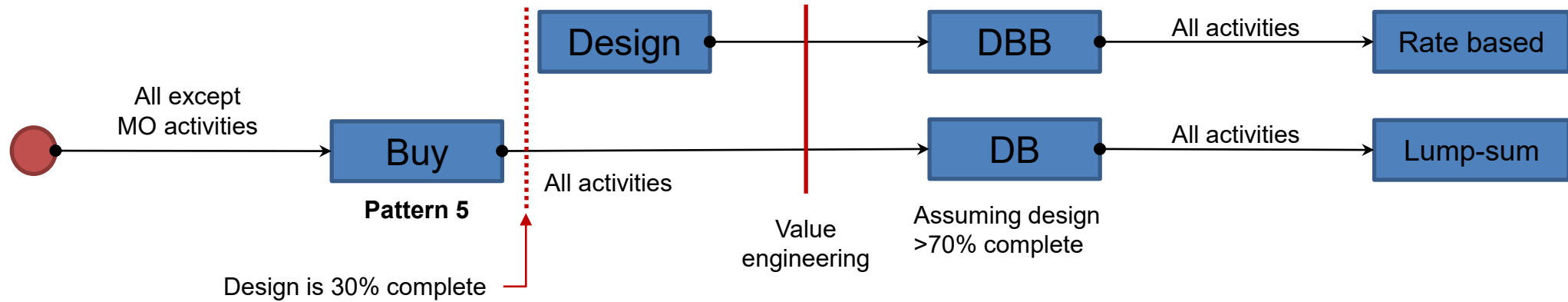


E6 in Norway – original procurement strategy





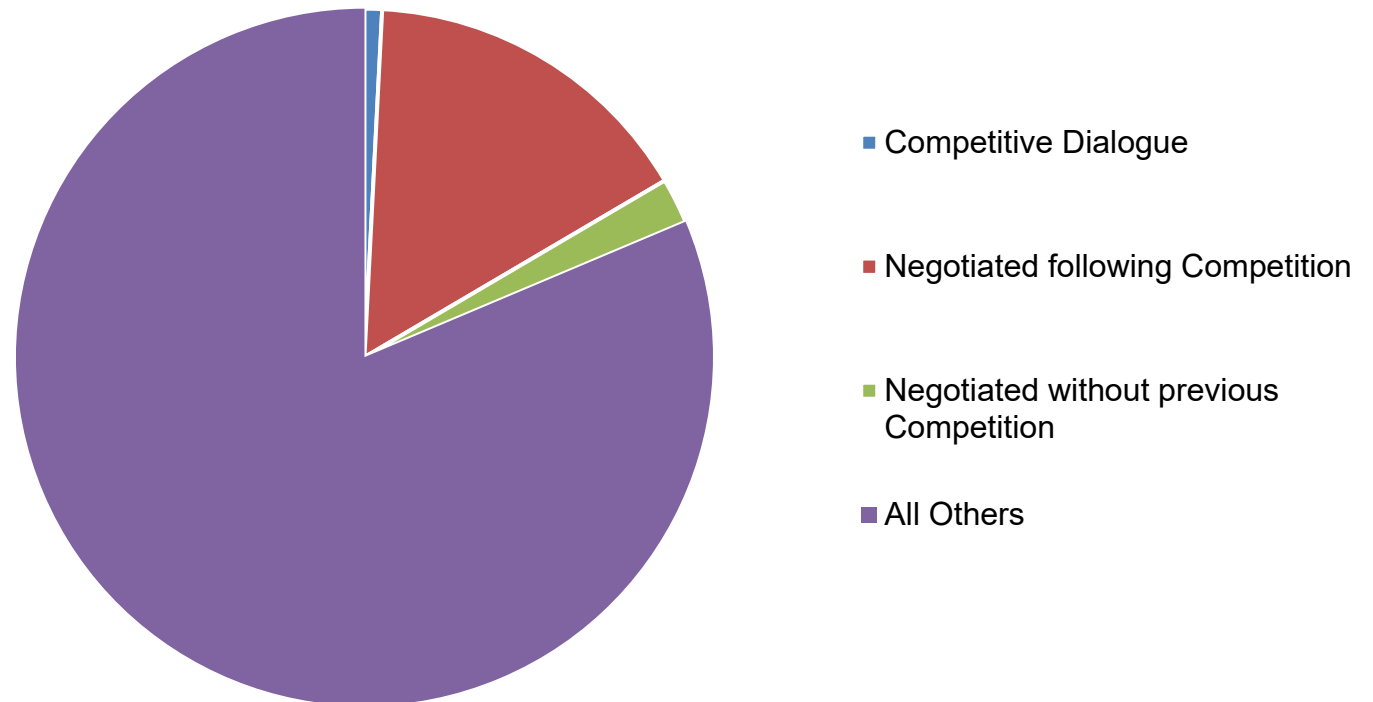
E6 in Norway – analysis outcome example





...which got us to where we are today (III)

- Pre-contract information exchange in the EU. Use in transport infrastructure 2006 – 2016:

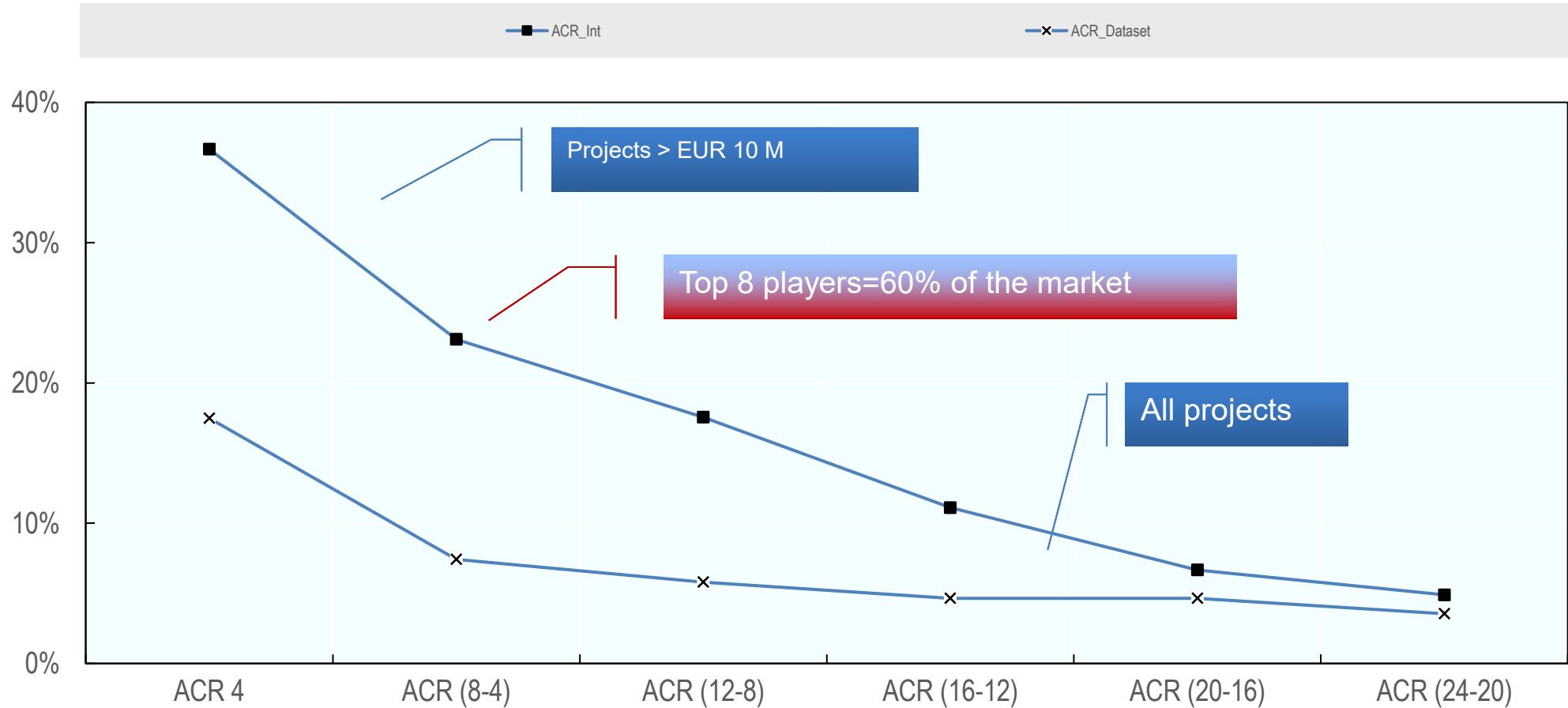


Note: Rail/road infra projects above EUR 50 m.

Source: Base on data in Roumboutsos (2019).



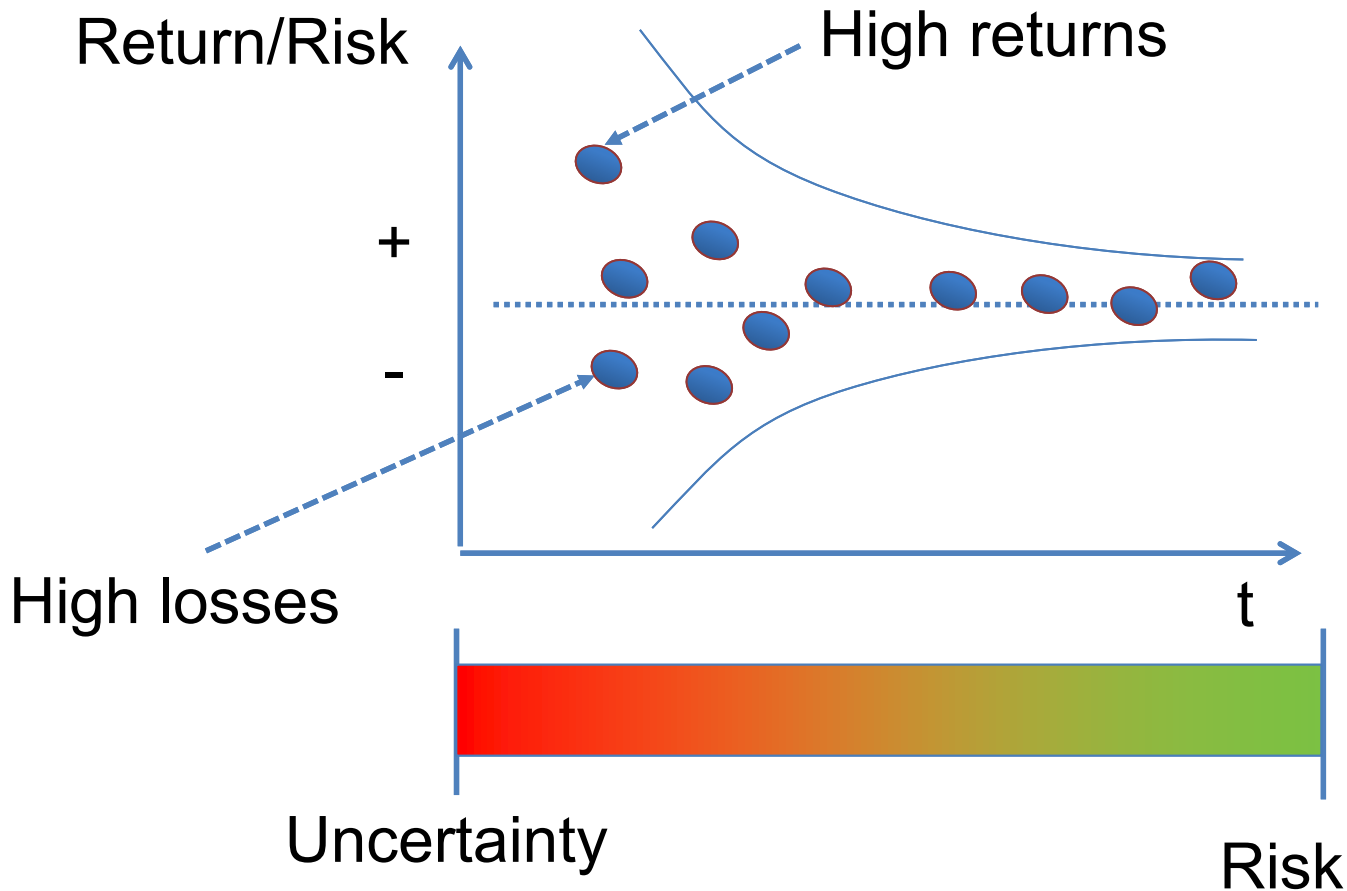
The procurement choices we make also shape the (infrastructure) bidder market





Auction theory v conventional fin. economics

Bidding “aggressiveness” v risk pricing efficiency



Two conditions for efficiency:

1. Credible commitment
2. Competition
- 3. Information (about risk)**



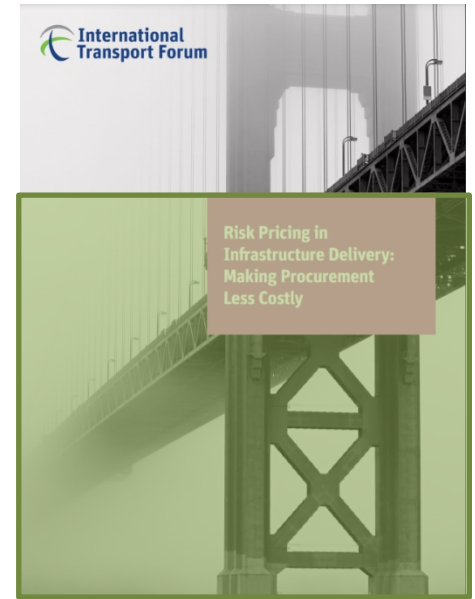
Key E18 tendering info

- The delivery model: DB lump-sum contract; value engineering performed on outline design. Operations and Maintenance first included as an option into the contract; then abandoned.
- 9 of 10 applications qualified; 4 invited to tender; 3 submitted their bid. Best Value winning criteria (price, risk management, ...).
- One of the key objectives at the time (2016) was to minimize legal conflict with the contractor. No conflict management instruments were established at the time (e.g. arbitration board).
- EUR340 k paid to contractors to develop the design/submit bid (stay in the game) during the bidding process. The winner does not get compensated.
- Norwegian incumbent won with PL bridge specialist (subcontractor). In-house estimate \approx EUR240 million; winning bid \approx EUR190 million.



E18 – pre-contract information exchange

- Negotiated procedure used during the bidding process (but no “negotiation” actually took place – only clarification).
- 50% completed design was made available to bidders.
- Winning bidder reportedly brought its design completion to 80%, before pricing its bid.
- The reference design was fully costed (at the available level).
- Contractor had option to use the default (already accepted) zoning plan or make adjustments. Geological investigations were part of the zoning plan. Contractor made adjustments to length of bridges.





Key E6 tendering info

- The delivery model: ECI contract. Target price. Open book accounting.
- 6 applications qualified; 4 invited to tender and 4 submitted their bid; 2 bids disqualified; 2 bids accepted. Winner FCC Construcccion–subcontractors Rambølland Johs. Syltern
- Project budget included in the tender - target price=contract value = EUR 261 million



E6 – pre-contract information exchange

- Competition with negotiation used during the bidding process.
- 30% completed design was made available to bidders.
- The reference design was fully costed (at the available level).
- Zoning plan still had to be completed in collaboration with Nye Veier.