

Contract design and procurement performance

Geneva, June 2017

The nature of any contract is risk transfer

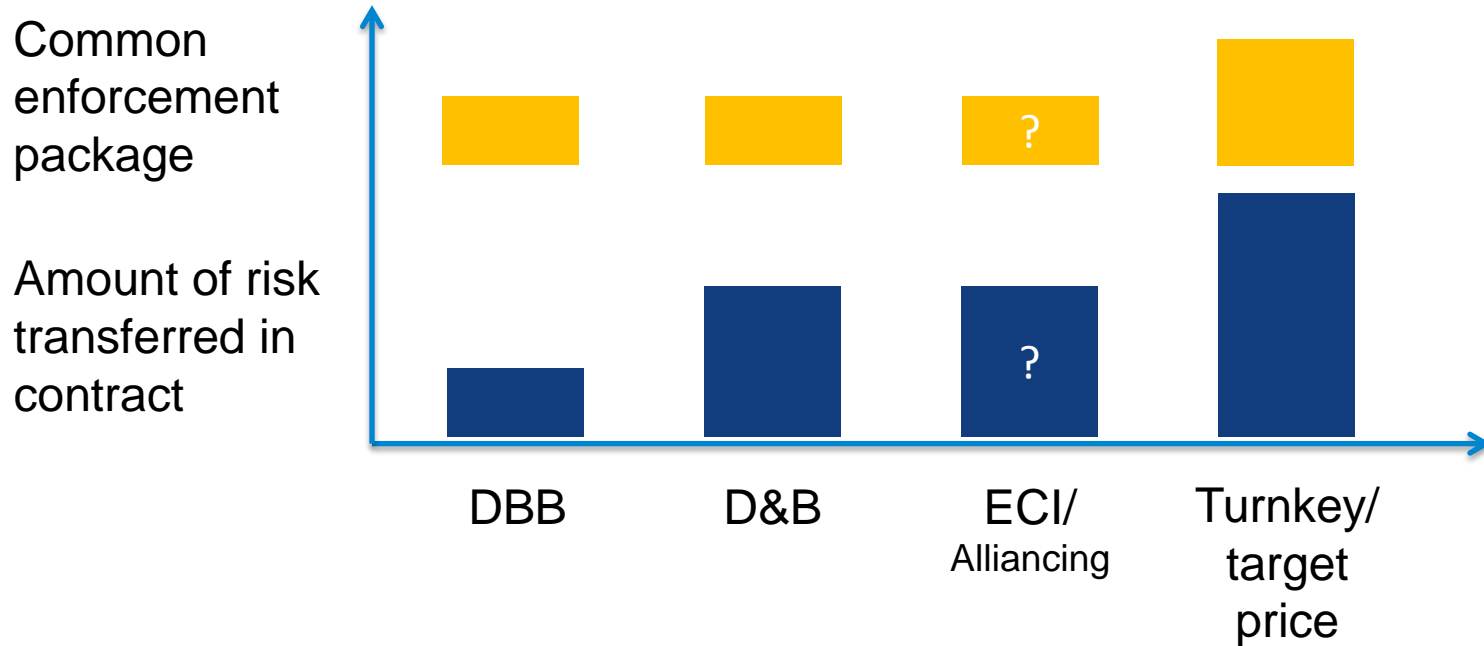
$$\text{Transferred Risk} \times \text{Efficiency gains} - \text{Transferred Risk} \times P = \text{Value for Money}$$



Project phase bundling (life-cycle costing), less cost overruns/delays, ...



Contracts have different “power”



There are a lot of opinions how contracts and concepts should perform...

Some examples:

- Transferring risk to the contractor (the party best able to manage it) will lead to an overall cheaper project.
- Bundling design & build will reduce variation claims due to errors and omissions in design and lead to an overall cheaper project.
- Stronger enforcement package (e.g. performance bonds) leads to overall better contract performance (and again a cheaper project).
- In PPPs bundling DB with OM will lead to life-cycle cost optimisation.
- ...



... and only a little evidence...

There is some evidence about on cost (and time) performance of low powered contracts for example

Source	Reference estimate	Project type	Time period ¹	Observ.	Average Cost overrun (%)	Area
Cantarelli et al. 2012b, Flyvbjerg et al. 2003	Decision to build	Roads	1927-2009	278	21.2	NW Europe
		Bridges, tunnels		39	25.3	
Cantarelli et al. 2012a	Decision to build	Roads	1980-2009	37	18.9	Netherlands
		Bridges, tunnels		15	21.7	
Makovšek et al. 2012	Decision to build	Roads	1995-2007	36	19.19	Slovenia
Lundberg et al. 2011	Decision to build	Roads	1997-2009	102	21.2	Sweden
Lee et al. 2008	Decision to build	Roads	1985-2005	138	11.0	South Korea
Ellis et al. 2007	Detailed design	Roads & bridges	1998-2006	1847	-13.40	USA
Odeck, 2004	Detailed design	Roads	1992-1995	620	7.88	Norway
Cantarelli et al. 2012c	Detailed design	Roads	1980-2009	23	-2.9	Netherlands
Ellis et al., 2007	Contract value	Roads & bridges	1998-2006	1908	9.36	USA
Bordat et al. 2004	Contract value	Roads	1996-2001	599	5.6	USA
Hintze and Selstead 1991	Contract value	Roads	1985-1989	110	9.2	USA

... actually very little evidence

- Evidence on superior on-time/on-budget of D&B vs DBB is inconclusive.
- Just looking at on-time/on-budget performance is insufficient, a view on end cost is necessary as well! (if we keep quality fixed)
- No idea about impact of enforcement packages.
- ...



Some recent progress on these issues ITF WG on Private Inv. in Tran. Infrastructure

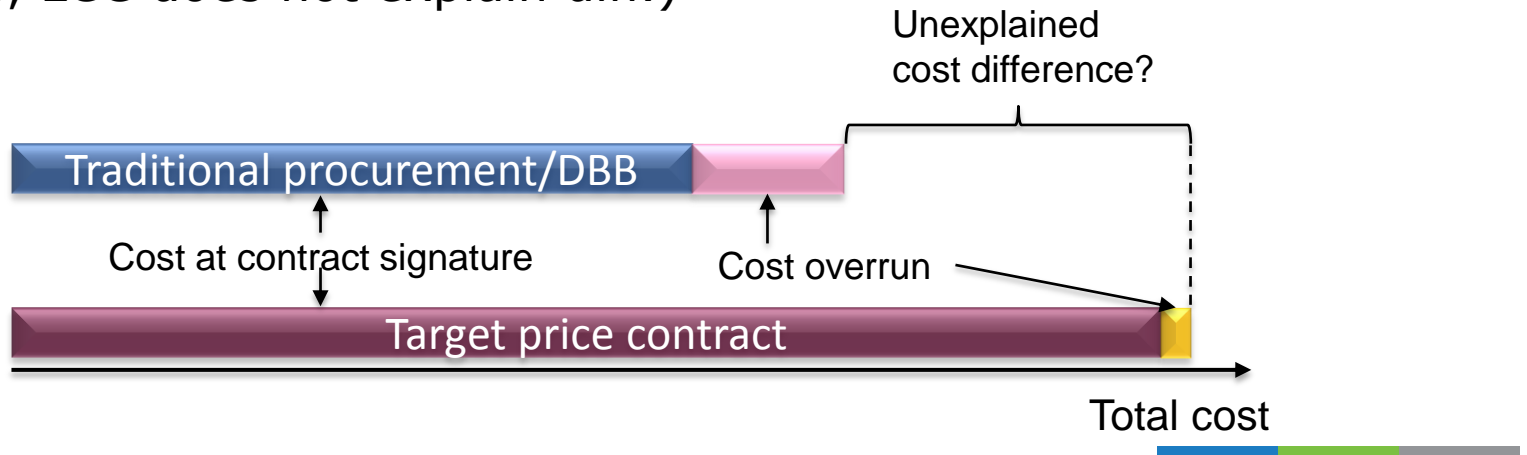
- The WG title may be misleading – it's about performance contracts in infrastructure procurement, risk allocation, and bundling => **the future of infra procurement and governance in general**



Indicative evidence of Silver vs Red FIDIC performance on road infrastructure

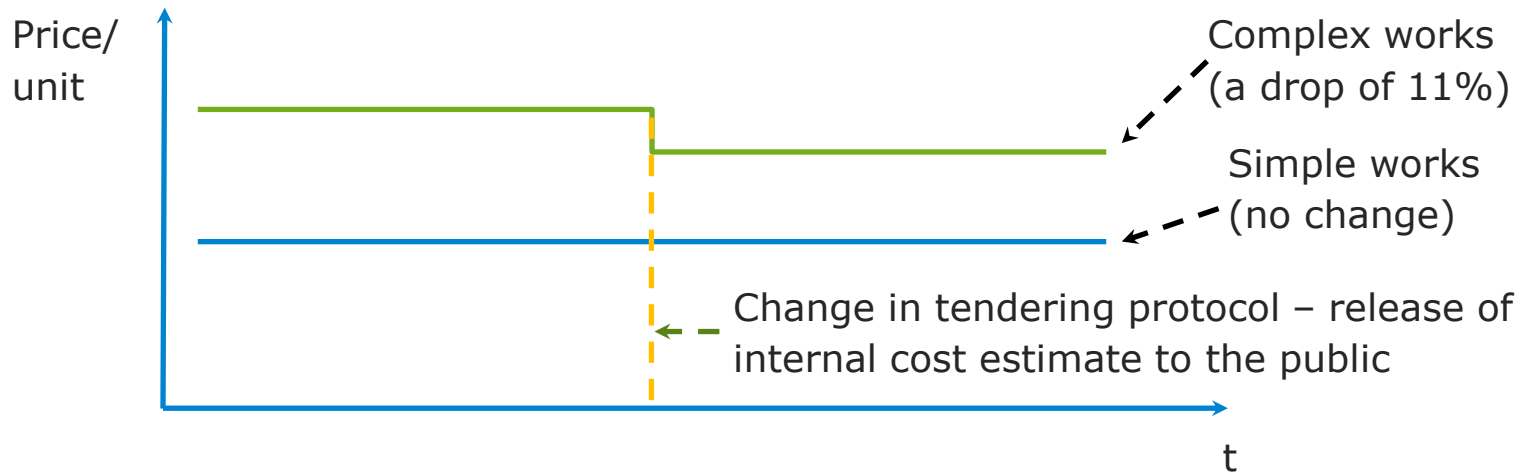
Is there indirect evidence of systematic errors?

- End cost difference disproportionally higher than risk transferred (premium in roads above ex-post risk (+20% in EU; +60% in the US), LCC does not explain diff.)



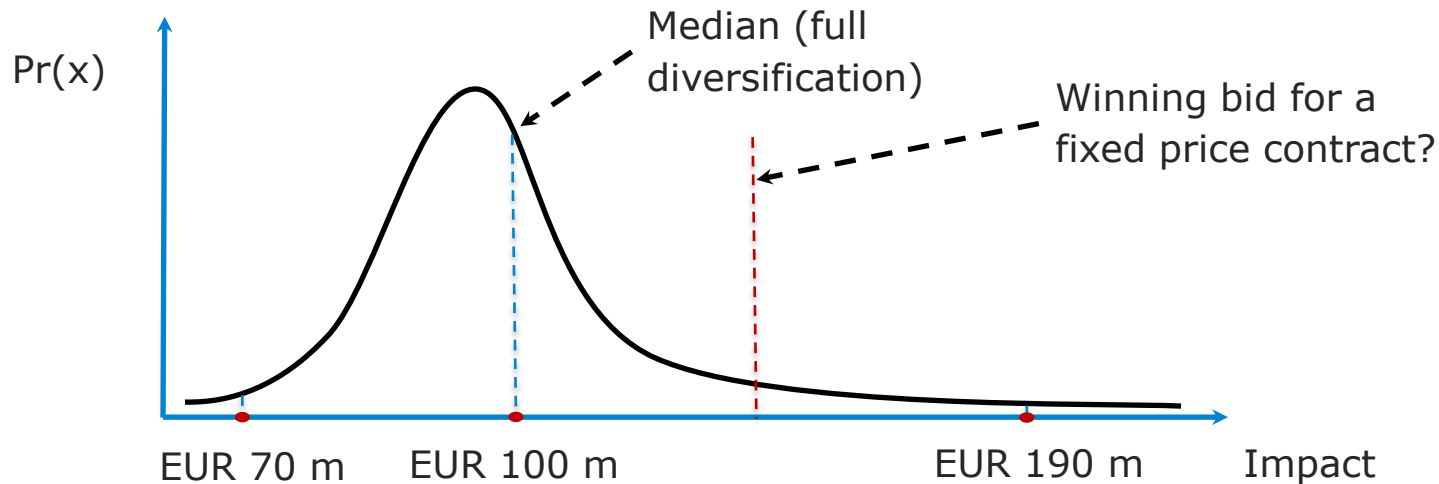
Just how important is information on Risk?

An example from low powered(!) contracts with fully effective competition (De Silva et al (2008) Oklahoma DoT)



High-powered incentives and risk?

What if we place a very strict requirement (e.g. 100 % insurance) on an agent (contractor) with limited risk info?



Competition and risk transfer



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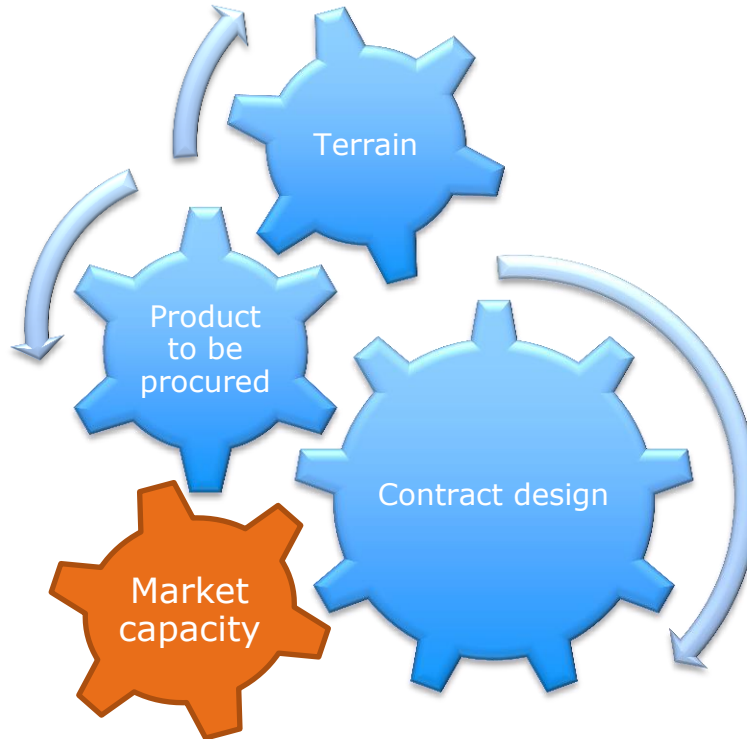


Clearly risk transfer matters, but...

- How does one design the optimal contract if even the basic relationships between risk transfer and performance are unclear?
- Massive potential savings could be unlocked.
- Currently, the developed world seems to be going in the wrong direction (the most developed countries with regard to infra delivery are moving towards:
 - a leaner public sector/, and
 - Higher powered contracts (larger expectations from the market)



What are the key cost drivers...



Are we sure we got them all?



Road construction cost data – an initiative to break a research and policy dead lock

Geneva, June 2017

What data is there available now?

- A few countries have comprehensive procurement databases (e.g. Italy) – not fit/insufficient for cross country/longitudinal comparisons.
- Partial small sample studies by individual bodies (most of them dated) for developed countries (e.g. Courts of Audit, a few empirical academics case studies; mainly from US on procurement type performance).
- Dated (possibly to be revived) database for developing countries (WB/ROCKS)
- Insufficient data is seriously limiting any analysis/policy advice!

Why a road construction cost panel?

- Is my case close to other countries average or an outlier?
- Is the deviation large enough to merit a detailed ex-post analysis (what lessons can be learned)?
- How does the market respond to economic events (e.g. regional demand push) through time? Is it different in my country than in others?
- How do different procurement approaches perform (e.g. is Design & Build actually preferred to Design-Bid-Build; previous presentation)? ...

=> A foundation for pursuing additional analysis upgrades in the future and individual case studies if necessary!

What do we propose – the objective

The objective = create a construction end cost database for motorway projects. It should:

1. define basic data quality requirements (database objectives)
2. start in mature, less complex environments (developed economies)
3. start with an initial stock of observations (e.g. a history of last 5 years) that already allow analysis
4. be periodically updated to track trends (frequency TBD)
5. **strike a balance between number of explanatory variables and data collection requirements**



How to do it?

1. A data collection concept needs to be developed (to meet the objective sub points below).
2. A network of contacts is required in the relevant motorway organizations to facilitate data collection
3. Statistics staff is necessary for managing collection and processing.
4. Capacity for executing high quality empirical and policy research based on the database is needed.

ITF is good on 1+3+4, but could use help on 1+2. ITF's contact network is at the Ministry level. It would take a lot of time and effort to meet points 1+2 alone. Partnering is better!

Which partner does what?

ITF	CEDR
Develop the data collection concept (define objectives of the database)	
Collect and Manage the data	Promote buy-in to the project among members
Include the trends in ITF statistical outlook	Provide experts to participate in the data collection concept workshop(s)
Execute empirical analysis of relevant policy issues, made possible by the existence of data	Liaison/assist between CEDR members and ITF to help resolve any questions
Offer case specific policy analysis to ITF/CEDR members, where invited	Review any empirical work ITF might produce based on the database

The database, the relevant section in ITF statistical outlook, and empirical work will be presented with both IO brands to symbolize the joint nature of the effort.



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