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Evaluation of private financing structures in PPPs

Jirka Gehrt

This presentation is based on joint research with
Dr. Thorsten Beckers and Jan Peter Klatt.



Berlin University of Technology
Center for Network Industries and Infrastructure
Workgroup for Infrastructure Policy



Focus on PPP projects with long-term transfer of cost risk

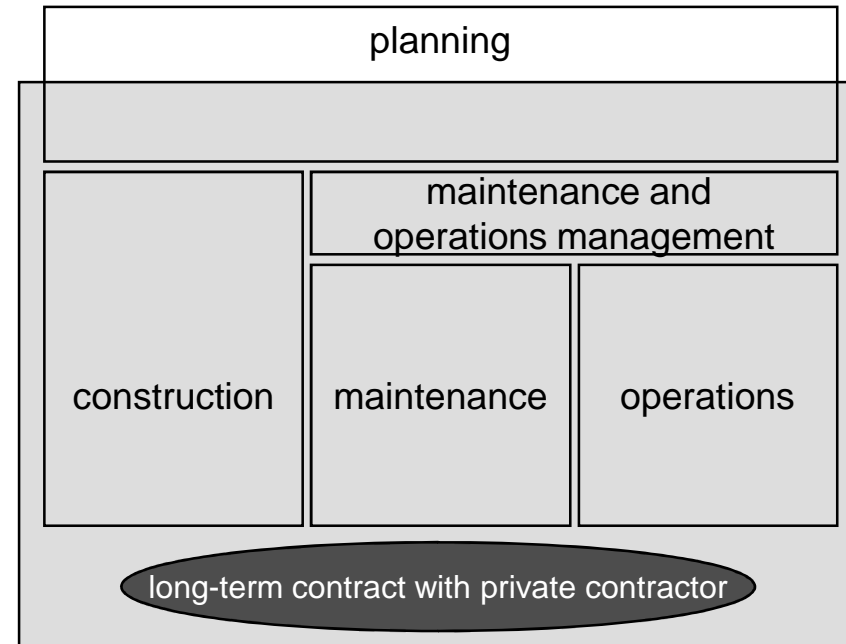
Definition and focus

PPP is the bundled provision of services relating to an infrastructure facility by one private contractor in a long-term contract

Focus on projects:

- with long-term transfer of cost risk to the contractor to provide incentives for lifecycle cost optimisation
- with high investment need
- with contractor remuneration from the budget

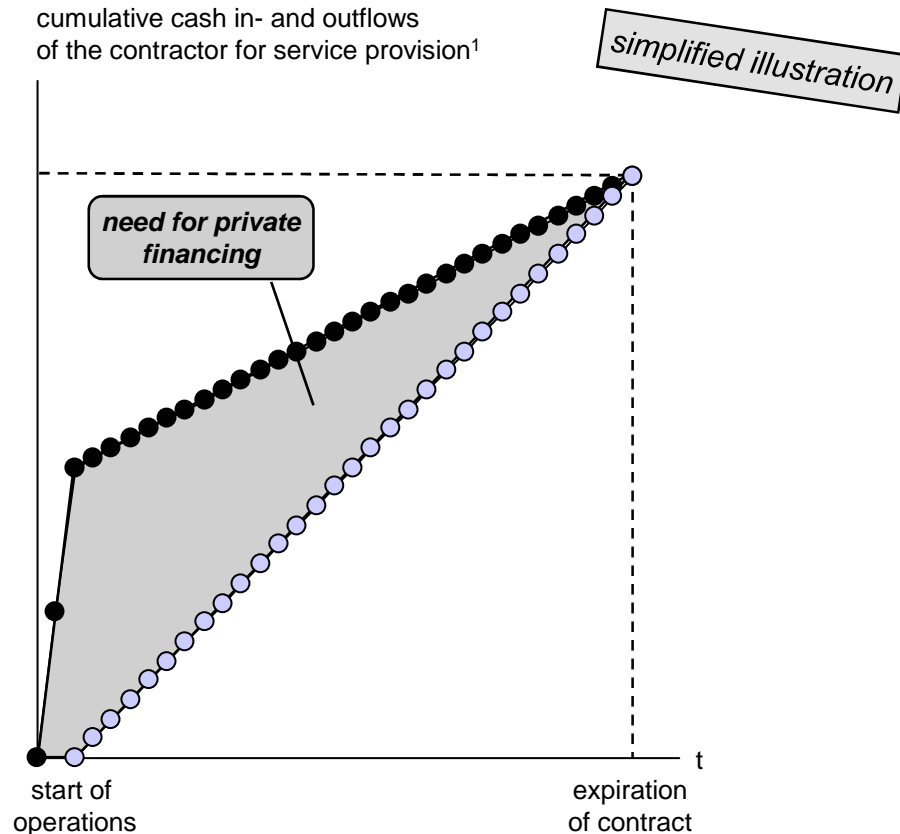
Schematic representation



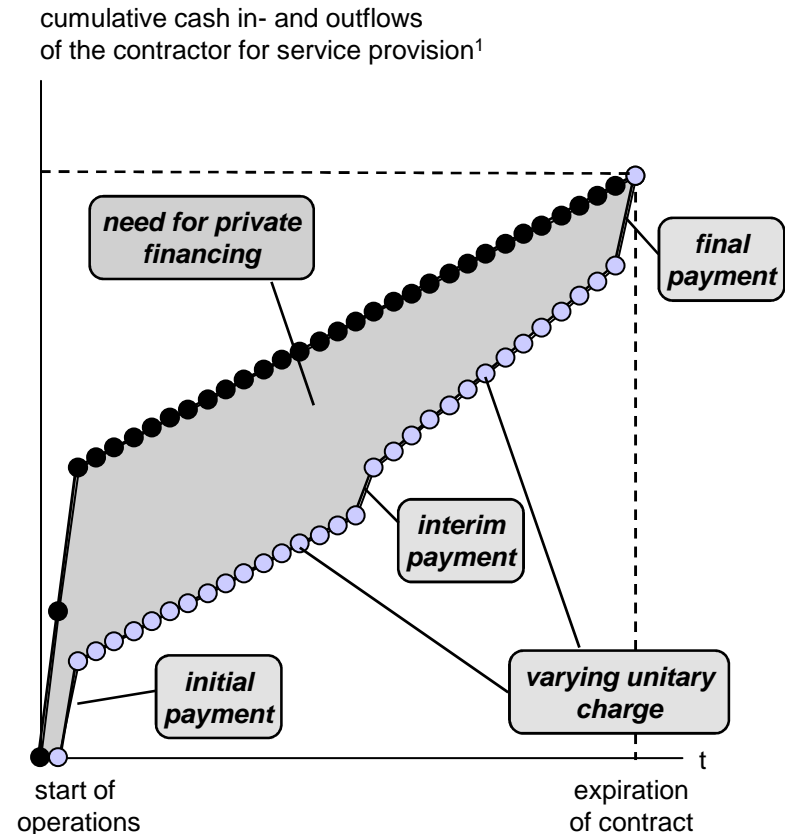
Contractors are typically required in practice to provide capital for the high investment need

Temporal design of compensation scheme determines financing need

a) Compensation scheme with constant unitary charge



b) Compensation scheme with initial, intermediate and final payment as well as varying unitary charge



● cash outflows for service provision¹ ○ inflows from compensation for service provision¹

(1) cash flows from financing activities, i.e. capital injection, interest, principal and dividends as well as respective compensation from the authority, are neglected in this representation – analogous results with consideration of financial payments

Incentive function is sound objective for private financing in PPPs

potential function	description	rationale
<p>earlier realisation through private funding</p>	<p><i>empirically, probably an important motive for using private finance</i></p> <ul style="list-style-type: none"> • with private provision of funds, projects may be realized earlier than with conventional procurement when government debt limits restrict further issue of gilt • however, privately provided capital increases indirectly government debt • budget rules that do not recognize private capital in government projects as government debt establish wrong incentives to bypass government debt limits 	<p>-</p>
<p>cost efficiency through incentive and safeguarding effects</p>	<ul style="list-style-type: none"> • private capital is "hostage" (Williamson (1983)) that is used to enforce the contractual risk allocation <ul style="list-style-type: none"> - establishes incentives for the capital providers to monitor contractor performance - can be used by the authority to cover losses in case of contractor failure 	<p>✓</p>
<p>"white elephant" test in concessions</p>	<ul style="list-style-type: none"> • with low external effects, profitability of private concession may be a good indicator for welfare evaluation • private investment choice may be used to determine whether willingness to pay exceeds costs of service 	<p>✓</p>

focus

Principal-agent theory: risk to be allocated in a trade-off between risk costs and incentives

risk allocation

- definition which of the contracting parties bears the outcomes of particular risks during contract term

trade-off from P-A theory

incentives

- with risk transfer, income/welfare of the contractor is directly dependent on his efforts to influence risk realizations
- hence, contractor is incentivized to control risk

risk costs

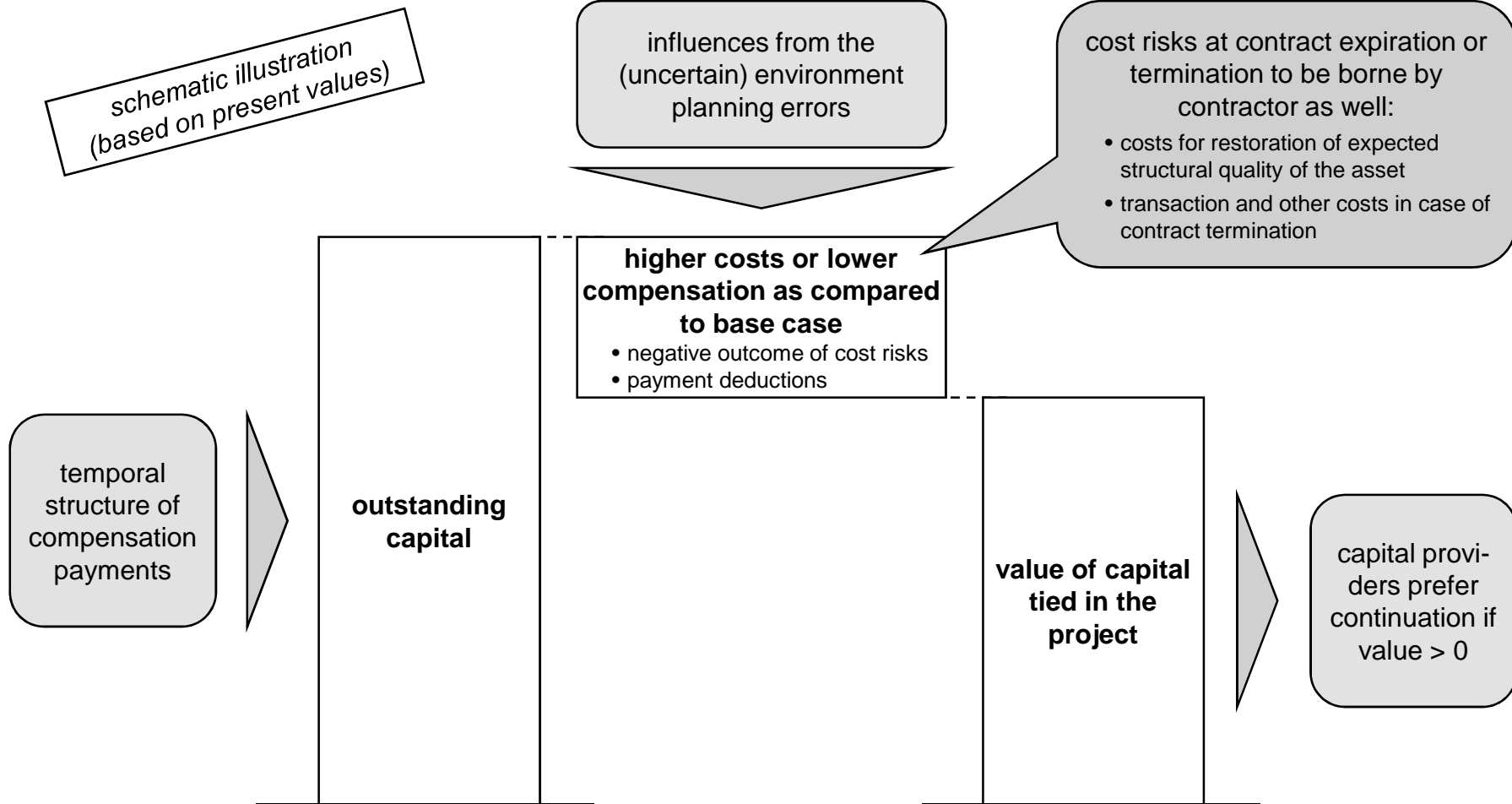
- public authorities is less risk averse than private contractors because of better diversification and risk spreading
- with risk transfer to contractor, risk costs increase

risks, over which the contractor has no or low influence, should be borne by the public authority
risks that can be influenced by the contractor should be borne by the contractor, in particular cost risks relating to construction, maintenance and operations to establish incentive for lifecycle costing

potential other effects of the risk allocation

- effect on competition
- incentives for distorted bids
- transaction costs

Private capital provides protection against contractor withdrawal when facing negative risk realizations

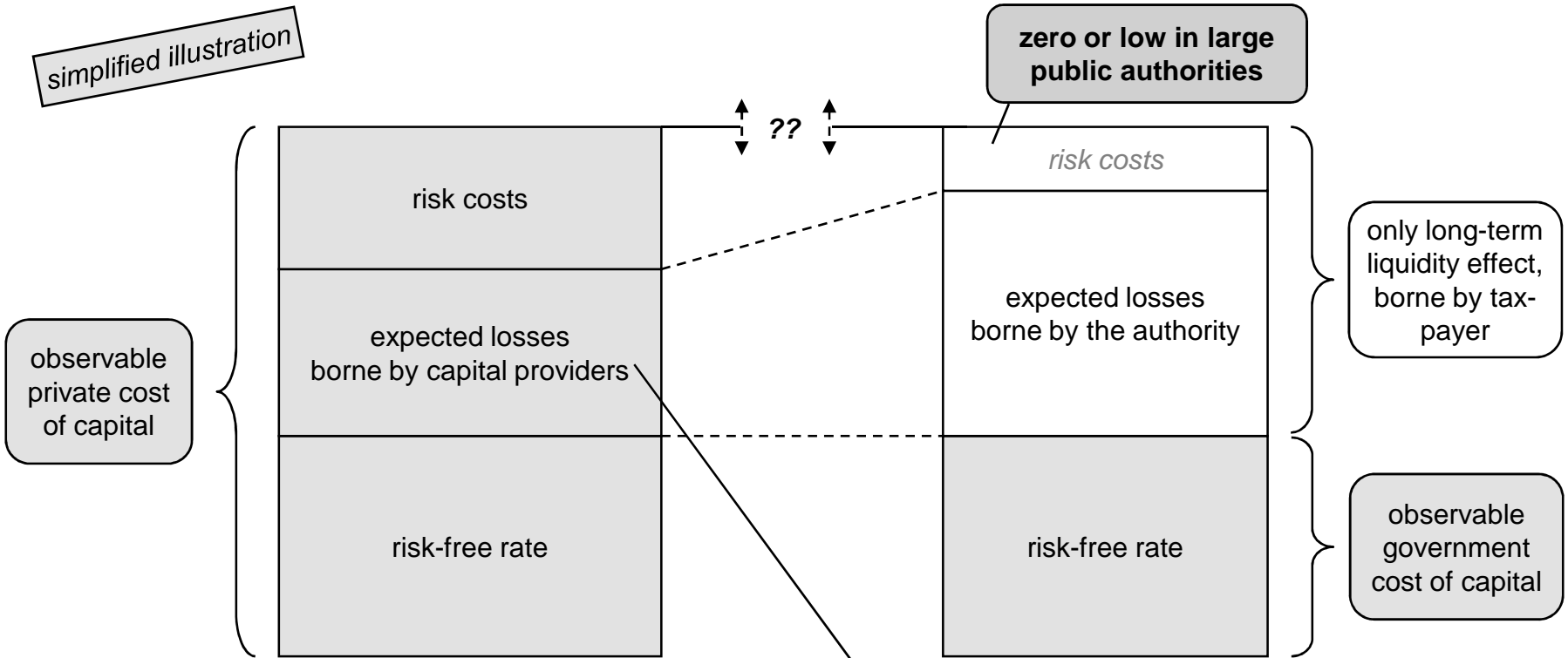


Without private capital, some cost elements without immediate liquidity effect

costs of authority with private capital

costs of authority without private capital

simplified illustration



- furthermore, transaction costs to be taken into account:
- structuring costs
 - monitoring costs by the capital providers
 - ...

tend to be lower because of incentives for capital providers to structure project appropriately and monitor contractor performance

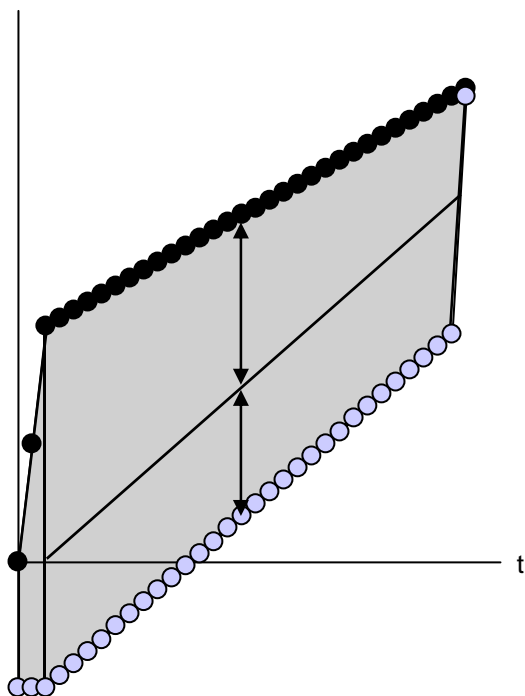
Hypothesis: Cost-efficient safeguarding with intermediate solution

assumptions

- investment of \$150, operations costs of \$5 p.a., 30 years contract term
- constant maximum damage in case of termination of \$80
- linear decrease of structural asset quality (to rebuild infrastructure) from \$150 to \$70

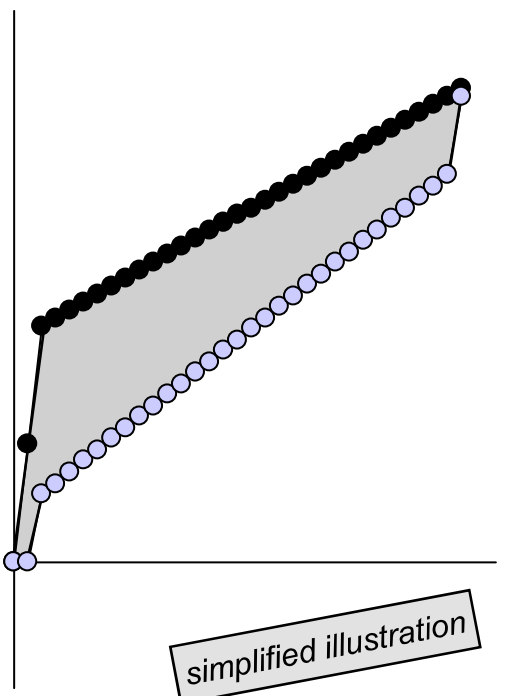
Full protection against losses

cumulative cash in- and outflows of the contractor for service provision¹



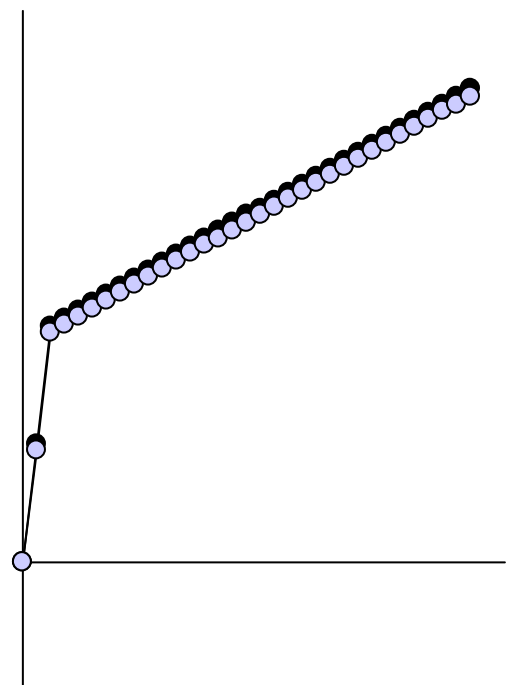
Intermediate solution

cumulative cash in- and outflows of the contractor for service provision¹



No protection against losses

cumulative cash in- and outflows of the contractor for service provision¹



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Different approaches to private finance in European PPPs

	Basic approach for initial financing in past projects
UK	100 % private finance
The Netherlands (road projects)	100 % private finance
Austria (road projects)	100 % private finance
Norway (road projects)	100 % private finance
Germany (road projects – federal level)	amount of start-up financing used as bidding variable
Germany (municipal projects)	very low risk capital (private funds presumably used for bypassing government debt limits)

supposed to be reduced in future projects

Monitoring with adjustment of private finance amount during contract term plausible in some circumstances

Basic idea and cost effect

regular monitoring by the authority regarding structural quality may be connected with adjustment of private financing amount

total effect on costs dependent on monitoring costs and impact on incentives and capital costs

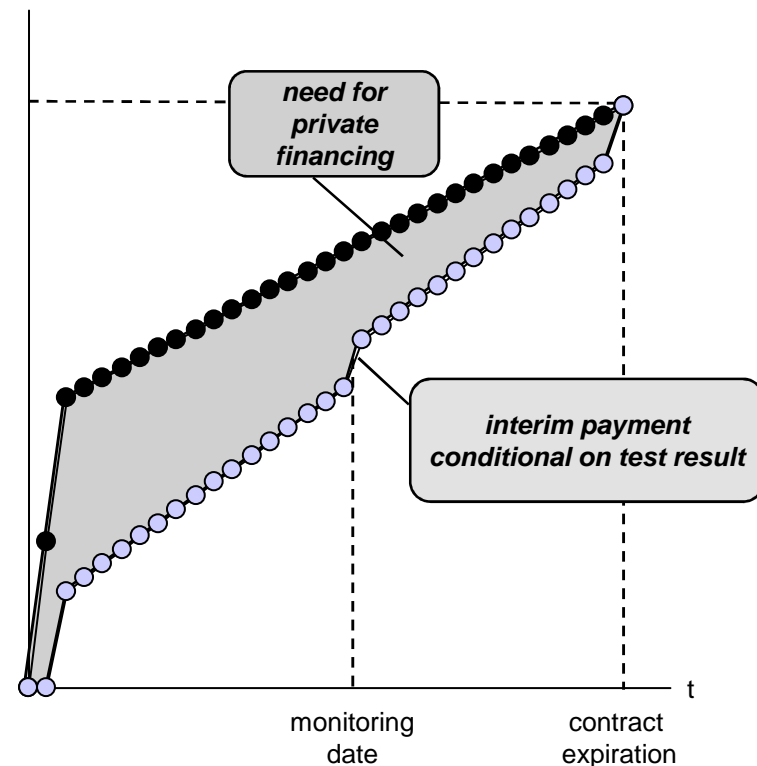
- reduction of private capital only with adequate asset condition – theoretically only small effect on incentives/expected losses and risk costs
- however, reduction of costs probable with incomplete capital markets – in particular, if there are opportunity costs of released capital for the contractor

requirements:

- structural asset quality must be forecastable
- structural asset quality must be measurable at some reasonable cost and relationship to cost for restoration of agreed-upon standard must be known
- political economy problems must be limited

Temporal design of the compensation

cumulative cash in- and outflows of the contractor for service provision¹



(1) cash flows from financing activities, i.e. capital injection, interest, principal and dividends as well as respective compensation from the authority, are neglected in this representation – analogous results with consideration of financial payments

Summary

- !** private capital in PPPs is mainly justifiable for incentive and safeguarding effect
- !** efficient use of private capital trades off incentives and risk costs → partial protection against losses from project efficient
- !** structural asset quality is one major factors driving the need for private capital
- !** in some circumstances, monitoring by the authority might be used to reduce need for private capital during the contract term
- !** diverging use of private capital in European PPPs