

PPP CONSTRUCTION RISK: INTERNATIONAL EVIDENCE FROM THE ROADS SECTOR

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The decision to use public-private partnerships (PPPs) to procure public-sector infrastructure assets is often substantiated by claims about on-time and within-budget construction delivery. This paper presents the results from an international survey of banks and other lending institutions about PPP construction performance – with particular emphasis on the roads sector.

This paper reports the findings from a global survey used to explore construction risk. The paper is comprised of three sections. The first two report the survey and its findings; first in response to a series of general questions about respondents' overall experience of PPP construction performance, and subsequently in response to more detailed questions where project-specific answers are provided. The paper concludes with a comparison of the findings from this survey with those from similar, yet smaller-sample, UK-focussed PPP construction performance studies.

RESEARCH OBJECTIVES

The research objectives were threefold:

- To test the hypothesis that experience with construction risk is better with PPPs than under conventional procurement methods;
- To explore whether or not experience of construction risk is more prevalent in some asset classes than others;
- To examine, where construction risks had become manifest, the main reasons behind construction period distress.

SURVEY RESPONSES

Response Rate

Over a three month period towards the end of 2006, 319 market participants expressed a desire to participate in the widely-publicised construction risk research by completing a prequalification survey. Of those, 161 completed the survey proper – a response rate of around 50%. The average exposure of respondents to PPP projects was 6 - 7 years.

Responses were received from professionals in 22 countries; mainly in Europe but also representing other parts of the world with active or developing PPP sectors (the US, Canada, Latin America, Africa and the Asia-Pacific region – mainly Australia).

¹ The research reported here was conducted while the author was employed by Standard & Poor's (London).

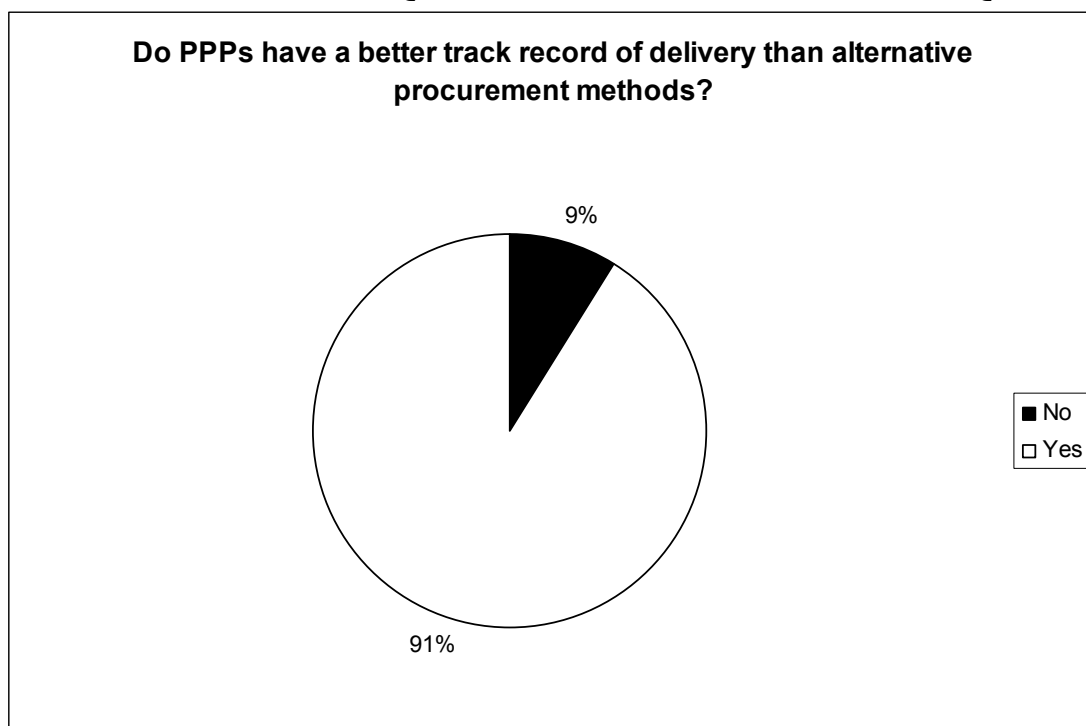
GENERAL QUESTIONS AND THE SURVEY RESPONSES

The responses to three general questions asked of survey participants are reported below. The survey asked respondents to provide answers, not based on their general views about PPPs or ‘market wisdom’, but based *specifically* on their project experience.

In Terms of Construction Risk, Do PPPs Have A Better Track Record Of Delivery Than Conventional Procurement Methods?

The question attracted 109 responses. The majority of respondents answered ‘yes’ to the question (over 90% – see Figure 1).

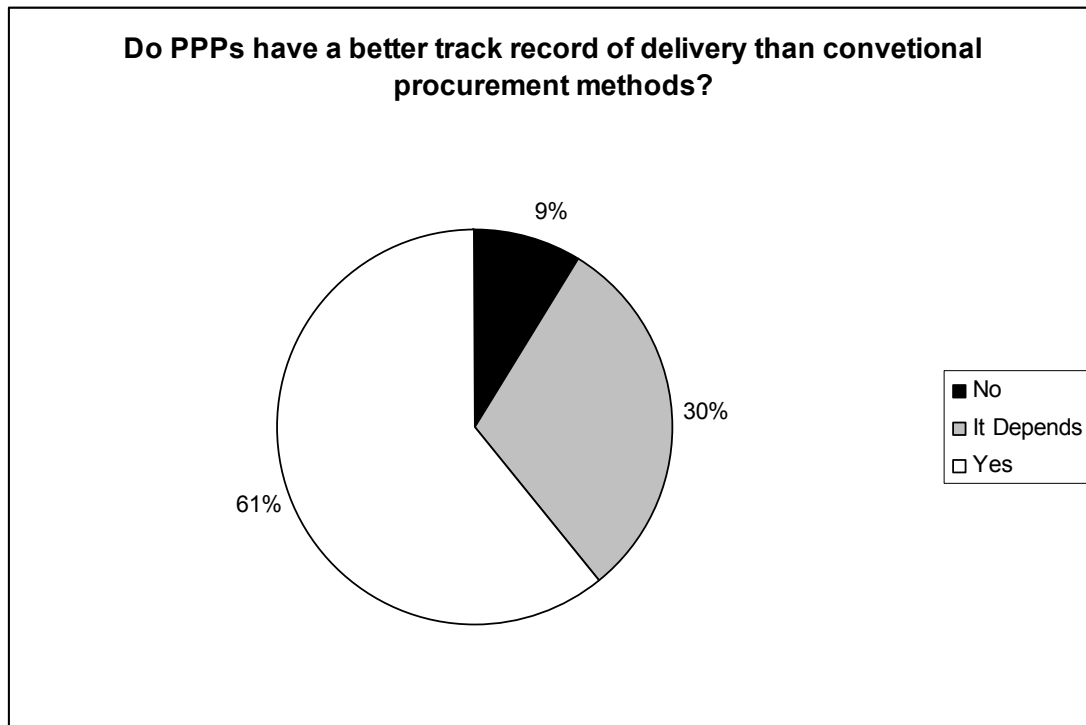
FIGURE 1: QUESTION 1 – RESPONSES TO THE CLOSED QUESTION



In the survey instrument, a comments box was provided next to this question and respondents were encouraged to expand on their answers. From the extensive use made of this comments box – and the comments themselves – it was clear that, although the majority of respondents answered affirmatively, a number provided qualifications to their answers. Comments frequently contained or were preceded by the phrase “*it depends*” – or variants thereof.

When those respondents who qualified their affirmative responses (to a significant degree) are considered separately, the pattern of answers looks somewhat different – see Figure 2.

FIGURE 2: QUESTION 1 – RESPONSES TO THE OPEN QUESTION



One-third of respondents who answered affirmatively provided comments specifically qualifying their answers – stressing that the comparative success of PPPs depends on:

- Adequate and accurate definition of the technical solution required;
- Adequate and accurate definition of contractual obligations, responsibilities, and risk allocation;
- Appropriate equity commitment, performance incentives, and penalty regimes;
- The objectives, commitment, engagement, experience, and sophistication of the public-sector partner or partners;
- Adequate protection against political interference and current position in the election cycle;
- The experience and capacity of the private-sector partners;
- The quality of project management and the extent of day-to-day, hands-on project supervision;
- The limitation of scope for claims and changes, and contractual clarity regarding the processes for accommodating change orders and variations;
- The implementation of policies and practices to avoid extended negotiations;
- The efficiency of existing public-sector procurement practices; and
- The calibre of the individuals involved.

Several qualifications underscored the fact that this question was asked in a relative context (Are PPPs better than conventional procurement?). Generally, respondents pointed to particularly poor experience with conventional public-sector procurement practices in terms of timely project delivery within budget and to specification. In this context, PPPs are reported to perform very well.

On the other hand, some respondents benchmarked PPP performance against already efficient international public-sector procurement processes, incorporating stringent performance standards and penalty regimes. In this regard, PPPs are reported to perform less well, or to offer equivalent performance.

A general note of caution is sounded by a couple of respondents who replied that it was too soon to say whether PPPs offer a better track record of delivery than conventional approaches. This reflects an important limitation of any PPP research—namely that PPPs are a relatively recent development. Globally, many PPP projects remain in the planning or construction phase. Furthermore, most of those post-construction are only in their earliest years of operations, when the assets are still new (possibly still in their warranty or latent defects periods) and there is limited visibility of whole-life experiences and costs.

Finally, in response to this question, a number of those surveyed identified – and in some cases name – individuals that had contributed to the success of PPPs; principally through their project management and leadership skills. This appears to be overlooked or commonly given a low ranking in most analyses of construction risk. Knowing more about key personnel, their background, experience, involvement, and certainty of retention, would appear to offer the potential for better understanding and containing construction risk.

Are Construction Risks More Prevalent in Some Asset Classes Than Others?

The survey asked respondents to identify the type(s) of PPP project most likely to encounter construction-related budgetary or scheduling distress. The *a priori* expectation was that specific asset classes would be identified as being more or less exposed to construction risk. Asset-specific responses were, however, the exception.

Although a number of those surveyed specifically mentioned IT projects, subsurface and demolition works (especially in the presence of asbestos), and refurbishment/renovation projects, most respondents stated that, in their experience, there was little correlation between asset class and construction risk. Instead, survey participants focused on the nature of the construction obligation itself.

A number of recurring themes arose in the survey returns, highlighting key areas of concern. These were:

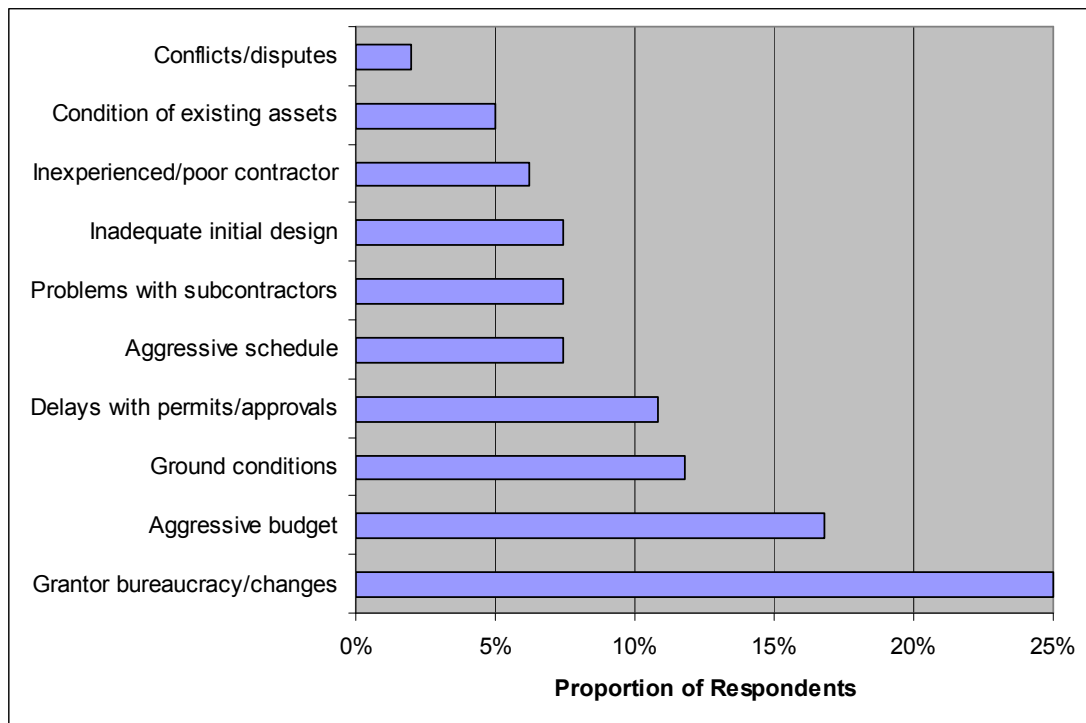
- New, untested or unproven technologies, technical standards, and process innovation;
- Poor performance definitions that are open to interpretation;
- Very large, complex, specialized, or highly technical requirements with a lengthy construction phase;
- Changing legislative, regulatory, and best-practice environments;
- Aggressive scheduling with little contingency, often to meet politically sensitive deadlines (for example, hosting a high-profile international sports event);
- Limited or late detailed design;
- Multi-site construction programs on operational sites with access constraints, especially those in densely-developed urban areas with decant requirements;

- Long, linear – rather than concentrated – construction sites, such as new-build tramways;
- Weak or inexperienced contractors (especially if there is limited contractor default protection);
- Heavy reliance on skilled trades or specialist subcontractors, or specific materials with supply chain uncertainties;
- Limited due diligence, understanding of ground conditions or investigative works, and legacy issues related to existing assets;
- Multiparty interfaces – especially if these rely on cooperation and goodwill;
- Incomplete expropriation, permits, approvals, consents or licences; and
- Complex project phasing and sub-phase interrelationships, dependencies and constraints.

What Are The Main Drivers Behind PPP Project Construction Budget Or Schedule Problems When They Arise?

Respondents were asked to draw from their PPP-related experience and list the main reasons behind problems with construction budgets and schedules. The most commonly reported responses are summarised in Figure 3.

FIGURE 3: MAIN REASONS FOR CONSTRUCTION BUDGET/SCHEDULE PROBLEMS



Nearly 25% of all responses about the causes of construction-phase problems for PPP projects identified the public sector, either directly or indirectly. Respondents went to some length to point out that their comments were not restricted to countries new to PPPs.

Examples of ways in which the public sector had frustrated the construction of PPP projects can be summarized under a number of key headings:

Capability: The client did not possess the experience, technical skills, or resources to manage the public-sector obligations associated with a long-term, active partnership with private-sector providers.

Legacy: The client tried to manage PPPs as they have previously managed conventional design and build contracts, including using amended design and build contracts, in an adversarial, ‘them-and-us’ environment.

Preparation: The client failed to define a clear output specification, to complete enabling works, to secure land, or to grant permits or approvals.

Expectations: The public sector client’s expectations of who is responsible for what, and what has to be delivered (by when) failed to match the private sector’s understanding.

Process: The client failed to establish streamlined, transparent procedures for day-to-day liaison with its private-sector partners. Bureaucracy was slow and resistant, and projects were dogged by extended negotiation periods and delays in achieving sign-off.

Oversight: Existing deficiencies in the client’s project supervision and control procedures will not be cured, absent any other changes, simply by moving from traditional procurement to PPPs.

Change: The client pushed for scope or specification changes, or variations, with limited regard for cost or time implications, or in the absence of contractual clarity about how such changes should be accommodated.

It is clear from the survey results that a number of PPP problems stemmed from incomplete public-sector ‘buy-in’ to the concept of PPPs. Practical examples reported included situations where:

- A political champion was promoting PPPs, with limited support from colleagues in their own political party;
- A government department was promoting PPPs, with limited support from its sister departments or other tiers of government;
- A municipality was promoting PPPs, with limited support from neighbouring municipalities;
- A political party was promoting PPPs, with limited support (or, outright opposition) from political opponents;
- Politicians were promoting PPPs, with limited support or considerable scepticism from their civil servants.

The survey results reinforced the notion that the large scale and highly visible, essential public-service nature of most PPP projects makes them targets for factions with explicit or implicit political agendas, hostile to the concept of private-sector participation in the provision of public services more generally.

Given the long-term nature of the contractual relationship, which will likely span a number of administrations (with different decision-makers), strong, cross-party support and engagement; and professional, non-politicised client-side management were identified as important mitigants of political risk.

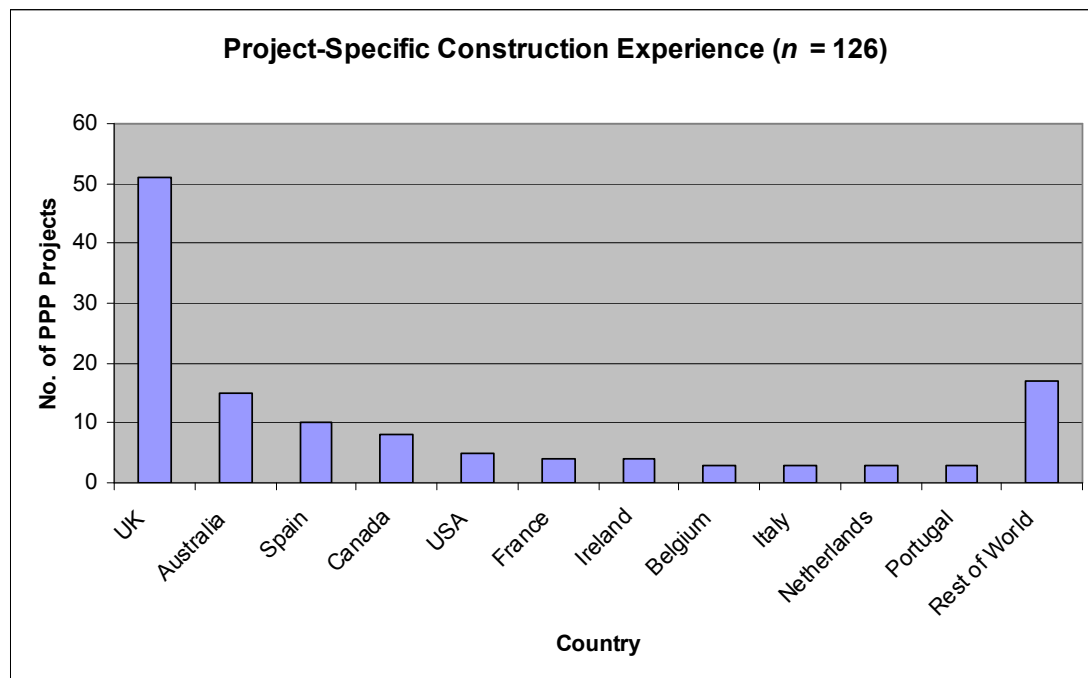
PROJECT-SPECIFIC QUESTIONS AND THE SURVEY REPOSSES

Sample Frame

Project-specific construction-related information was received from 140 survey respondents. As fourteen of these represented duplicates (information about the same PPP scheme from different parties) the sample covered 126 separate PPP projects. The projects' geographical locations are summarised in Figure 4; the distribution generally reflecting the different commitment to PPPs in different countries.

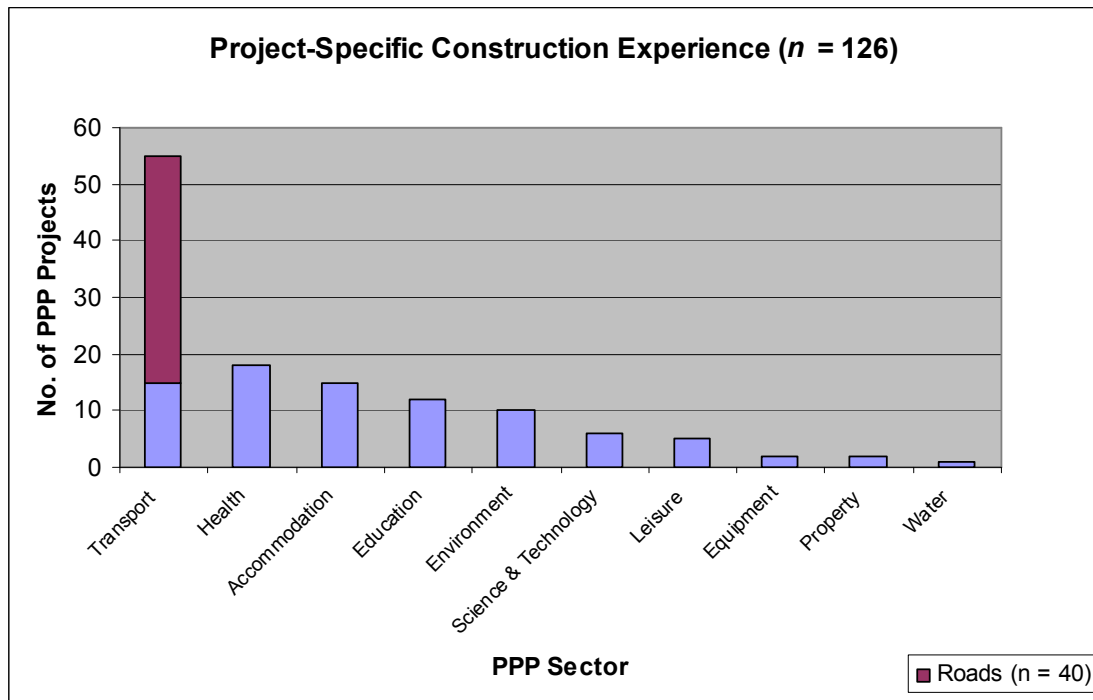
Nearly 70% of the projects are located in Europe. The largest geographical concentration came from the UK (51 projects, that is 40%).

FIGURE 4: PPP PROJECT SAMPLE – GEOGRAPHICAL LOCATIONS



In terms of sector representation, the transport, health, accommodation and education sectors accounted for 80% of reported projects (see Figure 5). Transport was the dominant asset class by some margin – with road projects accounting for nearly three-quarters of all transport PPPs.

FIGURE 5: PPP PROJECT SAMPLE – SECTOR REPRESENTATION



Analysis of the survey returns revealed that four of the PPP projects involved no infrastructure construction works (equipment supply, street lighting and property management PPP projects). They were excluded from sample. Another three projects were still in their pre-construction phase (including a road tunnel project). They too were excluded from further analysis.

Nine projects (including four highway schemes) were reported to be in construction at the time of the survey. Of these, the survey responses indicated that three were running behind schedule or over-budget; with the other six performing in-line with (or better than) expectations at financial close.

One of the road schemes was reported to be six months behind schedule and 10% over budget. The respondent stated that this was caused by a combination of poor contractor performance and site access problems (attributed to the public sector partner).

However, as the focus of this research was on (complete) construction delivery, these ten projects were also excluded from further analysis. This left a sample of 110 international PPPs – including 35 road projects – carried forward for further analysis.

Project-Specific Survey Responses

The survey required respondents to report if individual projects had been completed (a) within budget, (b) on schedule, and (c) to the required specification. In each case respondents were encouraged to provide further information to expand upon their answers.

Adherence to Budget

76 projects (69%) were reported to have been constructed within budget. The remaining 34 projects (31%) suffered from some degree of construction cost overrun. The results of analysis by geographical location and sector are summarised in Table 1.

TABLE 1: FREQUENCY OF CONSTRUCTION COST OVERRUN

	Construction Cost Overrun?		Sample Size
	No	Yes	
All PPP Projects	76 (69%)	34 (31%)	110
All UK PPP Projects	33 (72%)	13 (28%)	46
All Road PPP Projects	24 (69%)	11 (31%)	35

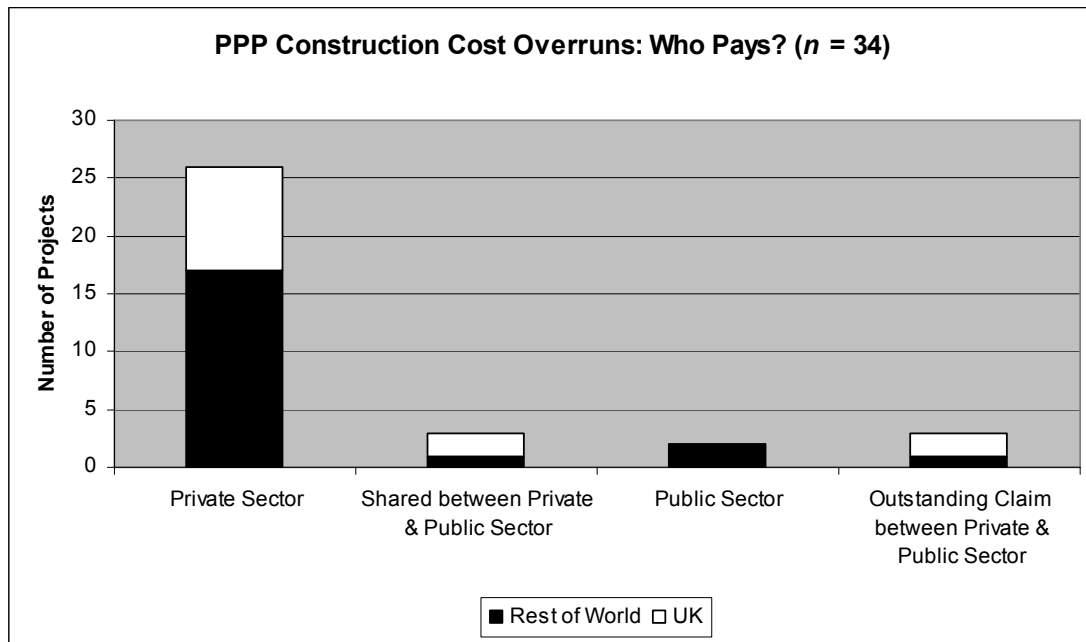
The incidence of cost overrun in the roads subset was identical to the sample average (31%). However UK PPPs generally appeared to perform better than the sample average; with only 28% of projects reporting any construction cost overrun. This may reflect the maturity of the PPP sector in the UK although, given the smaller sample sizes, such conclusions should be treated cautiously.

Of the road projects, the more common reasons reported for construction cost overruns included over-aggressive bidding, variations, particularly high specifications demanded from public sector clients and disputes about the scope of works. In the context of disputes, two respondents pointed to the fact that complications can arise when the primary construction contractor is also part of the SPV.

Generally, this is regarded as a useful project characteristic as it incentivises the contractor to perform. However in distressed cases a key shareholder may be reluctant to claim against credit support instruments (such as performance or completion guarantees) which they, themselves, are providing. Independent adjudication would appear to have a place in cases where ownership/control and contractual/business interests conflict.

A key issue in the context of this research is who paid for the construction budget overrun? Traditionally, this responsibility has fallen on the public sector – a procurement characteristic that PPPs (their risk allocation and use of fixed price contracts) are specifically designed to address. In terms of shifting this responsibility to the private sector, PPPs appear to have been particularly successful (see Figure 6).

FIGURE 6: WHICH CONTRACTING PARTY ABSORBED THE COST OVERRUN?



In over three-quarters of the projects reported to have experienced construction cost overruns, the additional costs were met, in full, by the private sector partners, their financiers and/or their insurers (leaving the public sector partner completely whole). This may, in fact, be an under-estimate. In the absence of open-book accounting, the profits or losses made by construction contractors (or their subcontractors) often remain hidden from other project parties. Nevertheless, it is the ‘insulation’ of the public sector procuring agency from construction cost overrun that is of central interest here – and in that regard the PPP performance appears particularly strong.

In only two cases – neither from the UK nor the roads sector – grantors met the full construction overrun costs; typically by making adjustments to annual payments to compensate for public sector-caused delays. In three other cases, cost overruns were ‘shared’ between the public and the private partners as a result of successful claims (or partly successful claims) resulting from judicial proceedings – or settlements agreed in advance to avoid such proceedings².

At the time of the survey, large construction cost overruns were reported to be the subject of outstanding claims between the public and the private sector partners on three projects (one, a non-UK road scheme). This highlights the fact that, although PPPs reduce the potential for claims, they do not eliminate it.

Construction cost overruns were reported for 34 projects. In seven cases, the actual magnitude of cost overrun was provided; expressed as the percentage by which actual costs exceeded budgeted ones. If these seven cases are representative, the distribution of outturn construction costs – when compared to original estimates – would look as it does in Figure 7.

² The details from one of these projects are in the public domain. In February 2007, the UK Department of Health paid £29.1m in damages to the Summit Healthcare consortium for cost and time overruns on the Dudley hospitals PFI project.

FIGURE 7: SUGGESTED DISTRIBUTION OF OUTTURN PPP CONSTRUCTION COSTS

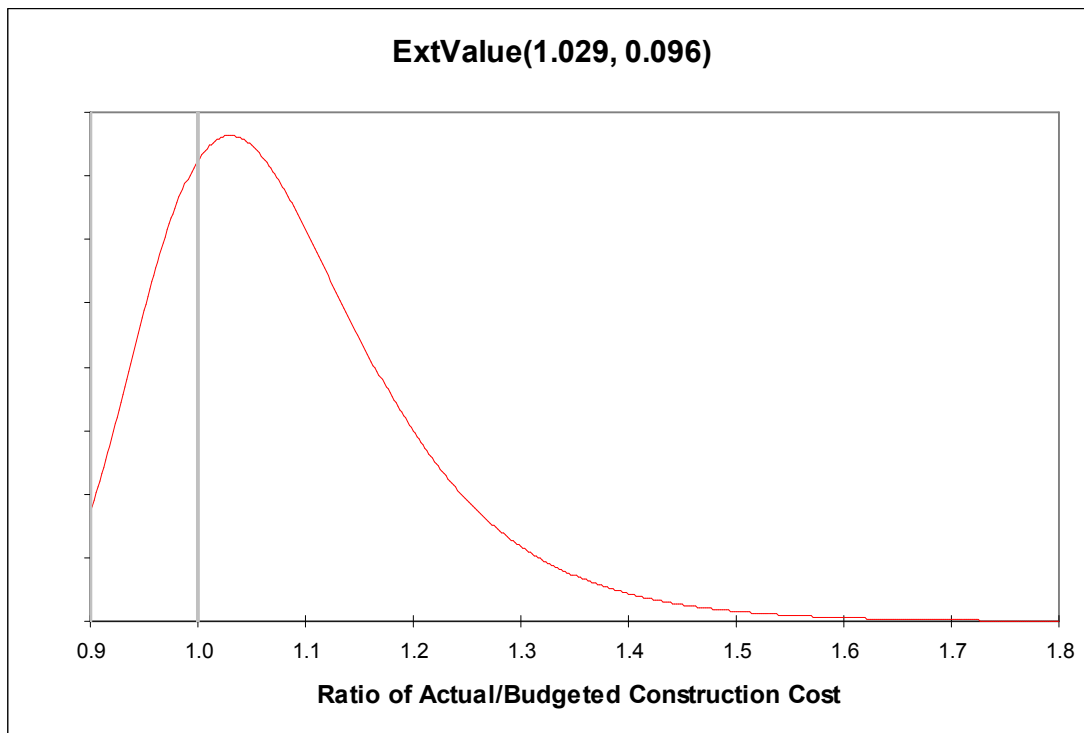
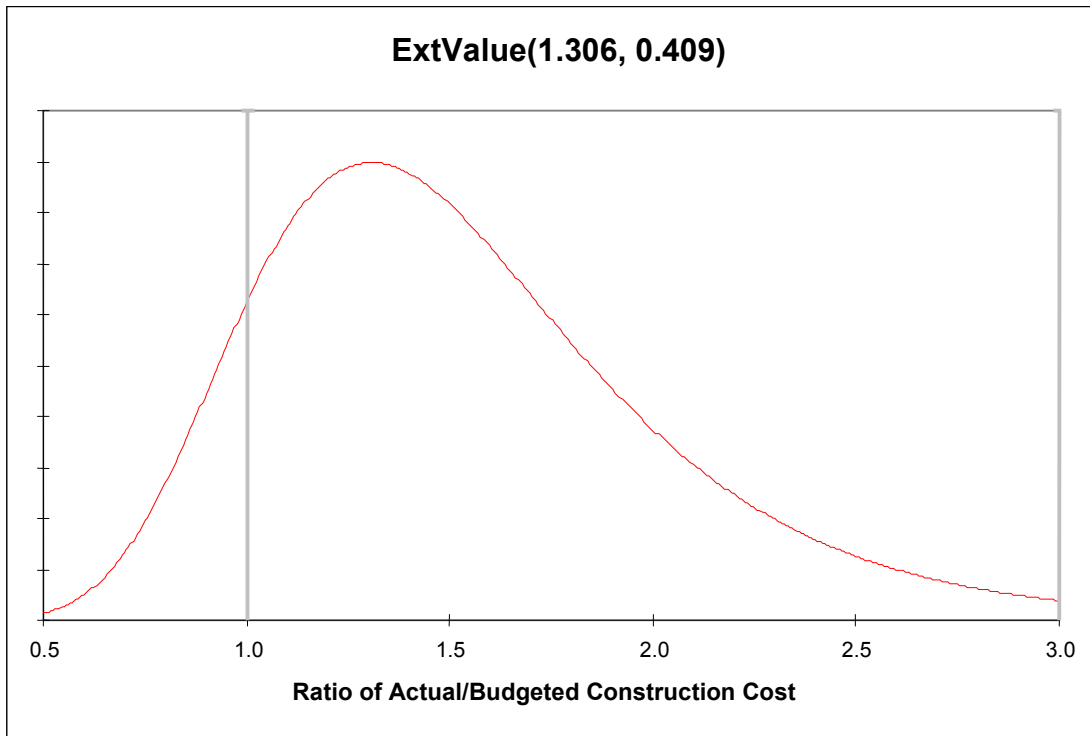


Figure 7 was created using the distribution-fitting capabilities of @RISK. The distribution suggested by the data was an extreme value distribution (ExtValue) – a ‘Gumbel’ distribution – with a location parameter equal to 1.029 and a shape parameter equal to 0.096.

The suggestion that construction cost overruns follow a Gumbel distribution has an intuitive appeal. Extreme value distributions are used in risk management models to capture the effects of rare but damaging events (McNeil, 1999). The low incidence of very high PPP construction cost overrun reported in this survey (and elsewhere – see, for example, Bain 2005) supports the use of a model that adequately captures infrequent yet important information in the right-hand tail of the distribution.

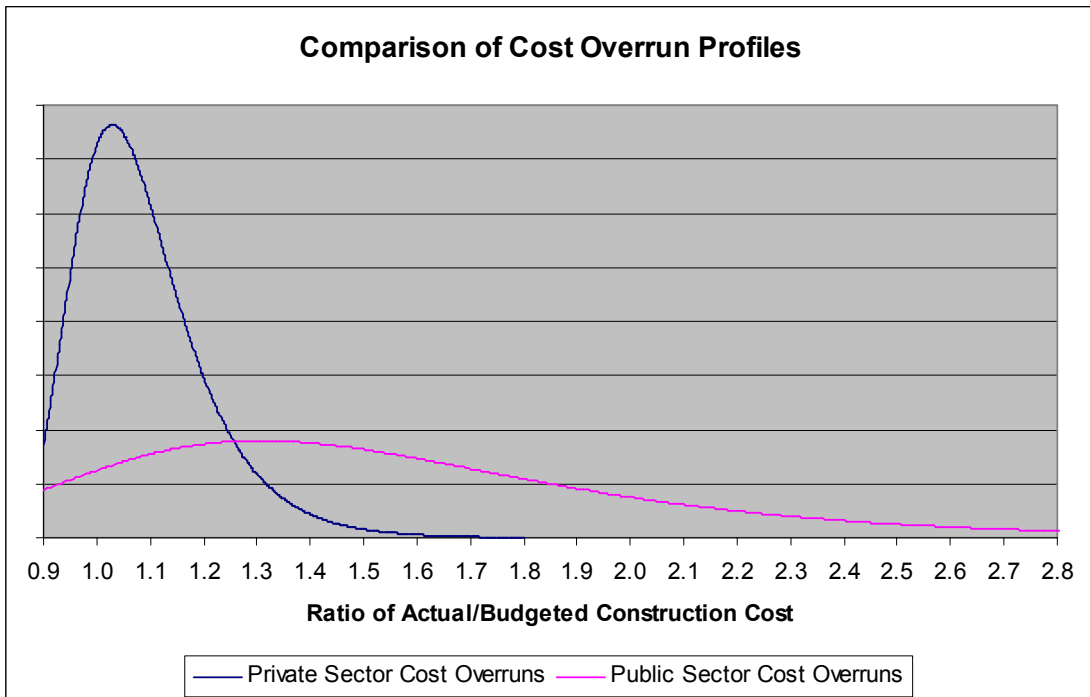
This distribution is narrow compared with those typically observed for public sector construction cost overruns. By way of a comparison, Figure 8 shows the distribution of actual versus estimated construction costs from 36 Highways Agency road schemes completed between 2002 and 2006 (Estimating and Monitoring the Costs of Building Roads in England, NAO, 2007).

FIGURE 8: PUBLIC SECTOR OUTTURN CONSTRUCTION COSTS (HA ROADS)



The two distributions are plotted together in Figure 9. Although this is not truly a like-for-like comparison, the difference between the two distributions gives some idea of the scale of risk reduction achieved by passing construction risk to the private sector.

FIGURE 9: PRIVATE SECTOR VERSUS PUBLIC SECTOR COST OVERRUNS



Adherence to Schedule

73 of the projects (66%) were reported to have completed construction works in-line with or ahead of schedule; leaving 37 (34%) behind schedule. The results are summarised in Table 2.

TABLE 2: FREQUENCY OF CONSTRUCTION SCHEDULE OVERRUN

	Construction Schedule Overrun?			Sample Size
	Ahead	In-Line	Behind	
All PPP Projects	12 (11%)	61 (55%)	37 (34%)	110
All UK PPP Projects	6 (13%)	23 (50%)	17 (37%)	46
All Road PPP Projects	11 (31%)	14 (40%)	10 (29%)	35

Analysis of the data by geographical location suggests that, somewhat counter-intuitively, UK PPP construction schedule performance is slightly worse than the sample average (37% of projects behind schedule, compared with 34%). As before, however, the difference is possibly not significant given the smaller sample size associated with the disaggregate analysis.

The roads data, however, does depart from the sample average. 71% of roads were completed in-line with or ahead of schedule (compared with 66% for all PPP projects), and the proportion of road projects completing construction in-advance of schedule was significantly higher than the PPP average (31% compared with 11%).

Of the eleven road projects in question, nine are part of either the UK or Irish PPP programmes which offer incentives for the early completion of highway projects. This finding is consistent with the results from the National Audit Office examination of PPP construction performance (NAO, 2003) which found that six out of seven English road projects were delivered early. The NAO's report is considered further at the end of this paper.

The extent of schedule delay reported varied from weeks to years³, however the most commonly reported delays fell between two and three months. This information was reported for ten out of the 37 delayed projects. If these ten projects are representative of all the delayed projects, this would suggest that around 80% of the PPP projects surveyed were completed within three months of the due date (see Table 3).

TABLE 3: EXTENT OF CONSTRUCTION SCHEDULE OVERRUN

Construction Completed...	No. of PPP Projects	Cumulative Percentage
Ahead of Schedule	12	11%
In-Line with Schedule	61	66%
Less than 3 Months Late	15	80%
Over 3 Months Late	22	100%

³ The highly-publicised National Physical Laboratory PFI in the UK was 6 years late (PAC, 2007).

Adherence to Specification

In terms of adherence to specification, PPP project construction performance was reported to be very high. Around 85% of all projects met their construction specifications in full, and this increased to nearly 95% in the case of road projects (see Table 4).

TABLE 4: FREQUENCY OF DEPARTURE FROM SPECIFICATION

	As Specified?		Sample Size
	Yes	No	
All PPP Projects	94 (85%)	16 (15%)	110
All UK PPP Projects	38 (83%)	8 (17%)	46
All Road PPP Projects	33 (94%)	2 (6%)	35

Many of the specification-related problems were reported to have stemmed from the use of unclear or ill-defined specifications or scopes of work from the outset. However other reported problems were linked to PPP projects that incorporated sophisticated technologies (such as those employed in water or waste treatment). Given that most road schemes sit towards the lower end of the technology spectrum, this is probably one of the reasons they performed relatively well.

SUMMARY & COMPARISON WITH EARLIER RESEARCH FINDINGS

Summary

The findings from both parts of the survey – the answers to the general questions summarised at the beginning of this chapter, and the subsequent, project-specific information – are consolidated in Table 5 (over page). Table 5 represents an evidence-based risk register that can be used by project participants to explore the construction risks associated with any new PPP projects.

By mapping project-specific characteristics against the register, risk exposure can be summarised in a logical, comprehensive and, importantly, consistent manner. The adoption of a consistent approach is particularly important to financiers and insurers – and stakeholders who wish to differentiate projects for purposes such as product pricing.

TABLE 5: EVIDENCE-BASED PPP CONSTRUCTION RISK REGISTER

Risk Category	Risk Assessment	
	Low Risk	High Risk
Project preparations		
Expropriation	Complete	Outstanding
Design	Detailed	Conceptual
Permits/consents	Granted in full	Granted in part
Investigations/site sampling	Rigorous	Partial
Project characteristics		
Construction challenge	Uncomplicated	Complex/highly technical
Construction skills	Standard civil engineering	Specialist engineering
Construction materials	Readily available	Supply-chain constraints
Construction scale	Small	Large
Construction duration	Short	Long
Construction technology	Proven	Innovative
Construction location	Greenfield	Brownfield (busy/operational)
Construction site	Contained	Long, linear
Number of sites	Single	Many
Site access constraints	None	Many constraints/limitations
Existing asset condition	Fully understood	Partially/not understood
Interfaces	Few/none	Multiparty interfaces
Works phasing	Simple/no interdependencies	Many interdependencies
Construction budget	Observed range/sufficient float	Aggressive
Concession Agreement		
Technical solution	Clear	Unclear
Performance requirements	Clear	Unclear
Risk allocation	Standard	Unique/unclear
Schedule	Sufficient float/no long stop	Aggressive
Deadline	None	Fixed by asset-use requirements
Performance incentives	Strong	Weak
Variations/change procedures	Clear	Unclear
Private sector		
Experience	Highly experienced	Inexperienced
Capacity	Sufficient	Limited
Project management	Strong	Weak
Commitment	Long-term focus	Short-term focus
Personnel	Broad skills base	Reliance on key personnel
Financial standing	Strong	Weak
Contractor replacement	Straightforward	Complicated/restricted scope
Project importance/reputation	High/strategically important	Low
Subcontractors	Few/standard	Many/specialist
Public sector		
Experience	Highly experienced	Inexperienced
Commitment	Strong	Questionable
Engagement	Active	Hands-off
Project management	Strong	Weak
Supervision	Active	Minimal
Personnel	Broad skills base	Reliance on key personnel
Practices/procedures	Simple/streamlined	Complex/ill-defined
Political/regulatory risk		
Support	Broad, cross-party	Limited
Elections	Past	Upcoming
Protestors	Uncontroversial project	Controversial project
Legal/regulatory framework	Stable	Evolving

Source: compiled by author

Proponents of PPPs point to their strong track record in terms of on-time and within budget asset delivery to the public sector, and the project-specific findings reported earlier provide further evidence in support of these claims:

- 69% of projects were delivered within budget, with only a small proportion of the overrun costs falling back on the public sector procuring agency.
- 66% of projects were delivered on-time. 80% of projects were delivered within three months of the original date specified.
- 85% of projects were delivered to specification, rising to 95% for PPP projects in the roads sector.

These findings are now contrasted with the results from other surveys looking at the construction delivery performance of PPP projects.

Comparison with Earlier Research

Three UK organisations have published reports containing the findings from similar PPP construction delivery-related research. These reports are summarised in Table 6.

TABLE 6: EARLIER PPP CONSTRUCTION DELIVERY RESEARCH REPORTS

Publisher	Date	Sample Size	Country	Focus on Road Projects?
National Audit Office	Feb. 2003	37	England	No
HM Treasury	July 2003	61	England	No
CEPA ⁽¹⁾	March 2005	41	Scotland	No
Bain (this paper)	April 2007	110	International	Yes

Note (1): Report prepared by Cambridge Economic Policy Associates for the Scottish Executive.

The main findings from each of these studies are summarised in Table 7.

Table 7: Comparative Analysis of Key Research Findings

	NAO	HMT	CEPA	Bain
% of projects which delivered price certainty to the public sector	78%	80%	49%	84% ⁽¹⁾
% of projects which delivered schedule certainty to the public sector	76%	88%	70%	77%
% of projects delivered within 2-3 months of the scheduled completion date	92%	n/a	78%	80%
% of projects which met or exceeded their specification	89%	n/a	n/a	85%

Note (1): This excludes public-sector initiated variations and the three projects with outstanding claims.

Specification

In its report on the construction performance of UK PFI projects, the National Audit Office stated that for 33 of its 37 surveyed projects “*the asset is performing to contract specification*”. The survey reported here asked a slightly different question: Were the construction works completed in accordance with the specification? However, any resulting differences are likely to be small and do not detract from the key conclusion; a very high proportion of PPP projects are delivered as specified.

Schedule

Again, slightly different definitions are used in the different studies. The NAO and CEPA report the number of projects delivered within two months of the scheduled completion date. The survey information presented earlier detailed projects delivered within three months of the completion date. However the general trend appears to be consistent; a very high proportion of PPP projects are delivered on schedule, or within several months of the date specified.

Budget

In terms of their research, the NAO and HMT focussed on public-sector perspectives. CEPA canvassed views from both the public and private sectors – mainly from the project managers in either sector. The survey reported here canvassed views from a wider range of stakeholders – the majority of whom were from the private sector. As such, slightly different perspectives are reflected in the respective survey responses. Although general consistency (in terms of findings) is observed with regard to construction delivery to specification and to schedule, the research evidence appears less consistent in the context of PPPs providing price certainty to the public sector.

Emphasis on the public sector (NAO and, to a lesser extent, HMT) provides information about variations but limited insight into the performance of construction contractors against their own budgets. Emphasis on the private sector (Bain) provides little information about variations – but rather more information the ‘internal’ financial performance of contractors. The reasons for this are two-fold:

- The private sector is primarily focussed on the arrangements secured at financial close, however variations are often accommodated outside these arrangements (for example, by the public sector making one-off payments for them directly);
- Construction contractors are typically shareholders in the project SPV and, as such, more information is available to their private sector partners – financiers, for example.

The CEPA research provides evidence about both variations and construction contractor-borne cost increases.

Public-Sector Borne Cost Increases

The NAO identified eight projects (22%) where construction-related price increases (falling on the public sector) were reported. The HMT survey found that 20% of projects (12 out of 61) failed to deliver price certainty to the public sector. In all cases these price increases were initiated by the procuring body through variations.

CEPA, however, identified nineteen projects (51%) subject to construction cost escalation (most of which were requested by the public sector).

The CEPA and the NAO or HMT samples can be combined. As CEPA surveyed PFI projects in Scotland, and the NAO/HMT surveyed projects in England, double-counting is not an issue. The results from these combinations are summarised in Table 8.

TABLE 8: CONSTRUCTION PRICE CERTAINTY – COMBINED SAMPLES

	CEPA	NAO	HMT	CEPA+NAO	CEPA+HMT
Sample Size	37	37	61	74	98
Price Certainty	18	29	49	47	67
Price Increase	19	8	12	27	31
% Price Certainty	49%	78%	80%	64%	68%
% Price Increase	51%	22%	20%	36%	32%

The combined sample analysis suggests that between 32% and 36% of the PFI projects experienced variation-related cost escalation and failed to provide price certainty to the public sector (one-in-three; higher than the one-in-five typically quoted in official publications – see, for example, OGC, 2007).

Construction Contractor Borne Cost Increases

In terms of construction cost overrun borne by the construction contractor, the NAO states that six out of the 27 project teams (22%) that commented on construction cost increase were aware that costs to the contractor had increased above those originally estimated. The HMT report contains no comparative information, acknowledging that its data did not reflect contractor-borne cost overruns.

This survey (Bain) finds that, for 29 projects out of 107 (27%), construction contractors faced increased costs (although, in three cases, these cost increases were shared with the public sector). This excludes the three projects which remain the subject of outstanding claims.

Whereas CEPA reports that only three of its public sector respondents were aware of contractor-borne cost increases, eight out of the 13 private sector respondents (over 60%) who were prepared to disclose outturn cost information reported that costs had increased.

From a public policy perspective, it is perhaps convenient to believe that, by passing construction cost overrun risk to the private sector, the risk ‘disappears’ or reduces to the point of insignificance. The data presented here can not address this issue in a relative context (PPPs versus conventional procurement) but it is clear that – in an absolute context – a significant level of construction cost overrun risk remains.

Even in a competitive bidding context, contractors are likely to account for this risk by building it into their tendered prices. Contractors who complete construction on-budget will thus benefit financially.

By passing construction cost overrun risk entirely to the private sector, the public sector transfers, not only the risk, but also any opportunity for reward from well-managed construction works programmes. This may be a trade-off worth making, however, in the absence of open-book accounting, the true extent of contractor profit or loss on PPP projects (the opportunity cost) remains hidden from the public sector procuring agency – and the trade-off can not be evaluated.

This paper has concentrated on the construction performance of PPP projects. In terms of delivering projects as specified and in accordance with schedule, PPPs appear to perform very well. The evidence regarding the delivery of price certainty to the public sector is, however, weaker.

Notwithstanding, perhaps most important are cautions in both the NAO and CEPA reports that their research was unable to judge whether similar construction performance could not have been achieved under alternative procurement routes employing fixed price, turnkey design and build contracts. In a similar vein, respondents to the survey reported here (Bain) stated that, when judged against well managed conventional public sector procurement, the construction delivery performance differential associated with PPPs narrowed considerably.

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